Out of the Box

The Midlife Crisis of the Digital Revolution

ARS ELECTRONICA 2019

FESTIVAL FOR ART, TECHNOLOGY, AND SOCIETY

ARS ELECTRONICA

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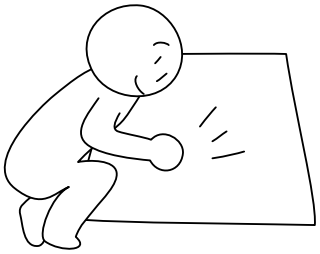
Out of the Box

The Midlife Crisis of the Digital Revolution



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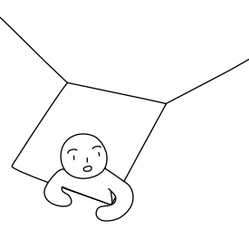

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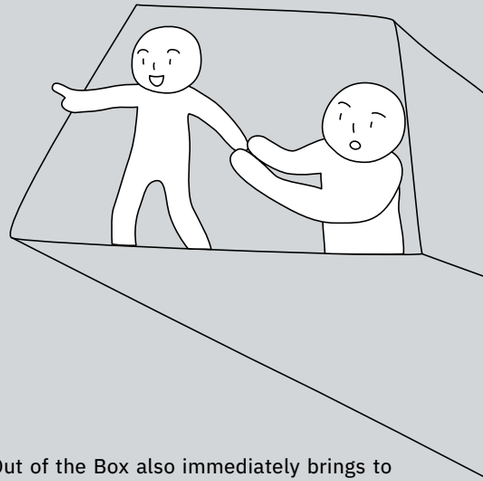
40 Years of Ars Electronica — 40 Years of Art Thinking



Art as a critical thinker's "second opinion" on the digital revolution

Being a festival for art, technology and society means using the methods of art and the sensorium of artists to observe and analyze possible future transformations as well as those currently happening, and to come to conclusions about their cultural and social dimensions and their consequences.
The time-honored principle of artistic thought and action "making the invisible visible," the curiosity to look at what's behind the scenes and the impulse to make something better, dissatisfaction with simple answers, skepticism toward default solutions, an unflagging creativity in the search for new ways and means — all these are factors, originating in the artistic ecosystem, that are perfectly suited to help formulate the enlightened, critical and qualified perspectives that we urgently need on our path into the future. A path that must take into account the problems of the present no less than it needs visions of a better future.
The history of Ars Electronica and its multitude of visionary artistic projects, whose future scenarios, both positive and negative, are increasingly coming true, serve to prove the effectiveness of collaboration among art, technology and society. All the more remarkable is the visionary power of those who founded Ars Electronica 40 years ago.

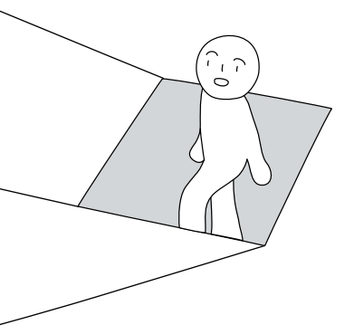
Out of the Box

The Midlife Crisis of the Digital Revolution

Out of the Box has several very different meanings. On the one hand, it refers to ready-made products that can be used immediately, which is more or less exactly what we see offered to us these days: consumption- and entertainment-oriented devices and the digital worlds of social media. We line up before opulently designed glass temples to buy unnecessarily expensive devices which we can then only use as the company that brought them to market sees fit. We cannot even change the batteries ourselves, and we have been stripped of the right to decide for ourselves how the data and information they generate is used.
What started out as a dream of technology that is easy for everyone to use has become the nightmare of a digital leash, for which we also pay a hefty price. As is so often the case in history, the decline of creativity and innovation begins with economic success; for a long time now, no new or useful features have come "Out of the Box", just the same old things in different packaging.
This very sobering "Out of the Box" of the economic sphere stands in contrast to the charismatic icons of the startup and innovation world. In this world, Out of the Box means departing from already blazed trails, thinking in a way that is completely new and disruptive of all conventions, in order to reinvent the world (or at least profitable products). If you can rent out your own apartment online, why not also rent out your own car and work as a chauffeur, especially if you can neatly spare yourself taxes and fees in the process...?
But Out of the Box also immediately brings to mind the proverbial Pandora's box, which, as we all too often assume, is the cause of the many current problems in our high-tech world.
In any case, no matter which of these readings we prefer, we must all get "Out of our Boxes". Out from cover, out of our comfort zones, our bubbles, our ignorance. Out of the mistaken belief that we can avoid responsibility for shaping the future.

40 years of digital revolution, but in truth we've only just begun

When Ars Electronica was conceived and brought to life in Linz at the end of the 1970s, the digital revolution already had a technological scope to be reckoned with, and yet it was largely unknown. Just 10 years previous, four computers at various locations in the western United States had for the first time been interconnected to form a network — overshadowed by the spectacular successes of the Apollo program. But in 1978 the Apple II and its brethren became the first affordable and usable desktop computers to enter the market, and in 1981 the company IBM gave its new model the designation "PC" (Personal Computer). Thus began a new phase, likely the most momentous, of the digital era: the personalization of computers, which brought them out of mainframe-heavy datacenters and research laboratories into our world and our everyday lives.
In 1989, ten years after the first Ars Electronica, Tim Berners-Lee and Robert Cailliau developed and made freely available the foundations for the World Wide Web, thus unleashing the greatest technological avalanche of all time — one might call it the socialization of computers — as a result of which some 4.5 billion people worldwide are now connected to the Internet.
Apart from short periods of hype and the frisson of dystopian science fiction novels and films, artificial intelligence had until recently led a downright unglamorous existence — but this has now abruptly changed. To date the digital transformation has been a digitalization of the



industrial world and its processes — what we once did without computers, we now do digitally or with digital assistance, up to and including our social lives. But now we are beginning to digitize our thinking and decision-making; and even if the reality of an independent, a strong or a general artificial intelligence still lies far in the future, we have nonetheless begun giving digital systems independence — in a way taking the step from automation to autonomy. And once again we find ourselves awestruck by and also fearful of what could come of it. But after the last 40 years, we now know that we dare not leave this development in the hands of technology companies. In no small way it is this ignorance that has led us into our current plight of an unbridled data economy.

We should use this occasion of crisis in the digital revolution to reformulate our questions about the future, and to concentrate not only on what technology makes possible, but on what we wish to do with it.

Ars Electronica Festival 2019, an international platform for art, technology and society

The extensive 5-day program of conferences, panel discussions, workshops, exhibitions, performances, interventions and concerts will consider these questions. The festival has been planned, organized and implemented in collaboration with international artists and scientists, engineers, designers, technologists, entrepreneurs and social activists from all over the world.

Formats and Programs at the 2019 Festival

Opening up the dimension of media-art and science to the general public has always been a main concern of Ars Electronica; nevertheless, intensifying the efforts in the avant-garde media-art genre with specialized partners, particularly in selected areas of emphasis, has been intrinsic to the spirit of Ars Electronica since its very inception. In order to live up to both ends of the spectrum the festival offers a variety of well-established and new formats. Celebrating the 40th anniversary of Ars Electronica this year, there will be a variety of special programs and formats diving into the history of the institution, for example the “ARS and the CITY” and the “ARS on the WIRE” exhibitions at the LENTOS museum or the 40th anniversary lounge at POSTCITY. The Ars Electronica Animation Festival is already an integral part and even earned the title festival within the festival. Another well-known format by now is the focus on digital music and sound art with Music Monday and Sonic Saturday in cooperation with the Anton Bruckner Private University. The introduction of the Ars Electronica Gallery Spaces two years ago, as a setting for media artists, collectors and galleries to compare experiences and discuss core issues like the conservation of media-art project, also sparked great interest. Markus Poschner will conduct his third concert with the Bruckner Orchestra in conjunction with the Big Concert Night, in which the program concentrates on connecting as well as juxtaposing tradition, the state-of-the-art and modernism. As a special attraction, the festival will also make a Saturday excursion into the extraordinary ambience of the Abbey of St. Florian for a new festival program on artificial intelligence and music. The new AIxMusic festival has been developed in cooperation with the European Commission.

Symposia, Workshops, Tutorials

The Opening Symposium “History Day” is not only dedicated to the 40th anniversary of the Ars Electronica and the 100th anniversary of the guest university Bauhaus University Weimar, but to take an in depth glance into the history of media art in general. From artworks and projects in the exhibition to symposia the recurrent theme “Out of the Box. The Midlife Crisis of the Digital Revolution” will be explored from a multitude of angles throughout the whole festival. The theme conference “Midlife Crisis of the Digital Revolution” on Friday explores the current and future prospects of our increasingly digital world. At the “European Forum for Digital Humanism” on Sunday, the discussion will revolve around strategies and ways to cope with the ever increasing digitization in a sensible way with a particular regard to the European humanistic heritage.

The STARTS Day offers lectures, panels and workshops on the potential of evolving future innovators and encompasses tours through the STARTS Prize Exhibition.

Theme Exhibitions

It is perhaps one of the most inherent traits of humanity to strive after more, to explore the unexplored, to push our own limitations over and over again — as individuals, and as society. With the powerful technologies at hand today — from bioengineering to artificial intelligence — it is more important than ever to reflect on the way we want to use them collectively. At its core, the exhibition Human Limitations — Limited Humanity revolves around the relationship between humanity and the environment, and our limitations therein. Furthermore, this year a whole new section will be introduced, the European Platform for Digital Humanism, not only encompassing a multitude of programs and partners, but illustrating the increasing importance of international collaborations. Of course, from a curatorial and certainly an organizational viewpoint, there have to be subdivisions, especially when it comes to setting up installations in premises measuring almost 100,000 square meters. The theme exhibitions have been structured according to two fundamental approaches, though there is a great deal of overlapping among them. Art and Technology projects, the origination of which was motivated primarily by research and exploration, make up the exhibits in the large halls on the 1st Upper Level; art and technology projects that are primarily means of artistic expression predominate in the large exhibition parcours arrayed in the spectacular spaces of the lower Levels.

CONFERENCES, LECTURES, WORKSHOPS

Conferences

Opening Symposium: History Day

The first day of the Festival will start with two conferences and focuses on the 40th anniversary of the Ars Electronica Festival:
The Faculty of Media, Media Art and Design of the Bauhaus University Weimar is celebrating its 100th anniversary this year, also highlighting the deep history of the relationship between art and technology. The Bauhaus University Weimar is this year's guest university of the Ars Electronica Campus program and is represented with an extensive exhibition in the rooms of the Kunstuni Linz on Hauptplatz.
Afterwards, the search for traces of the beginnings of telecommunications art, with its forward-looking visions and artistic practices that are still relevant today, will be the focus of a program designed by Josephine Bosma in collaboration with the Ö1 Art Radio. (A separate exhibition on the history of telecommunications art and Net-Art will also take place in the POSTCITY.) The History Day conferences are dedicated to the anniversary celebrations of Ars Electronica. After 40 years in existence, we reflect on the various forms of digital media art that emerged during this time and have been part of the Festival. Pioneers of artistic movements with strong impacts on the digital revolution from all around the globe will discuss outstanding ideas, practices and contributions from the intersection between art and technology.

Theme Symposium: Midlife Crisis of the Digital Revolution

On Friday, the conference moves forward in time to explore current and future prospects of our increasingly digital world. Art and Creativity have always been viewed as important contributors to ensuring that future technological implementations will happen under consideration of enlightened, critical and qualified perspectives. During recent years we have lost confidence in the impartial and responsible use of our digital technologies and media. We should put up for discussion whether trust in distinguished media outlets needs to be reestablished and the growing role of social media for formation of public opinions should be critically questioned. We should establish a sensible implementation of the emerging autonomous systems into our society, without forfeiting our humane values to economic calculations. Not only the arts, technology and economy are presented with the important task to help we won't lose our humanity on our journey from automatization to autonomization — how can every one of us take active roles in shaping our future? A section of this conference is part of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe programme of the European Union.

European Forum for Digital Humanism

The Sunday conference program will concentrate the European challenge to find a distinct European approach in shaping our future. How can Europe guarantee that emerging technologies won't lose touch with our humanity and humane values? Recent years have brought to light some serious fallacies in machine learning systems, requiring us to make sure that artificial intelligence will be fair, inclusive and responsible. We have always created helpful tools for our living and survival. But since our technology has become ever more invasive, we should closely monitor the handling of our data by automated decision making processes. The question arises how we can take sensible regulatory action across Europe and even on a global scale, and how these processes could look like. This conference is part of the European ARTificial Intelligence Lab, which is co-funded by the Creative Europe programme of the European Union.

Lecture Program

Expanded Animation — Out of the Box

In collaboration with the Upper Austria University of Applied Sciences' Hagenberg Campus, the 7th Expanded Animation symposium carries on a process launched in 2013 — mapping the wide-ranging domain of animated worlds of imagery beyond the well-trodden paths. The symposium stays the course originally set at its inception, and presents theoretical positions and perspectives from the art world, the R&D field and the industrial sector. The mission: To function as a driving force advancing an interdisciplinary discourse. This year's symposium takes the festival motto *Out of the Box — the Midlife Crisis of the Digital Revolution* and offers several panel discussions on current trends in the extended field of computer animation.
Out of the Box in the sense of "thinking against all conventions" captures the basic essence of the Expanded Cinema movement, widely regarded as a pioneer of media art.

Digital Theatre Network Meeting

How can digital technology add to the magical, theatrical moment? Digital theatre entails a multitude of approaches and perspectives. Believing that new developments in digital theatre and technologies can increase engagement by bringing theatre to new audiences and sectors, ETC and Ars Electronica together with experts from the field, discuss respective experiences, current projects and trends. Finally, the audience is invited to exchange ideas with the panelists about possible future applications of the digital in theatre.

PRIX FORUM

One of the absolute highlights of every Ars Electronica is the opportunity to meet Prix Ars Electronica prizewinners and attend Prix forums to hear the artists elaborate on their oeuvre and current work. Prix Forum "Computer Animation" is held on Friday in conjunction with Expanded Animation Symposium in the POSTCITY, which is connected with the Ars Electronica Animation Festival screening rooms. Prix forum "Digital Musics & Sound Art," and the brand-new category "Artificial Intelligence & Life Art" are held on Saturday in the OÖ Kulturquartier, where the CyberArts exhibition is located. Right after the Prix Forum on Saturday, the shuttle bus brings you to the AI x Music festival at St. Florian!

Gallery Spaces Panels

The Gallery Spaces Panels are situated in the Säulenhalle. Deep in the core of POSTCITY, gallerists, artists, theorists and collectors dig thoroughly into the complexity of the new media market out of their own experience. From business models for young artists, through the contemporary art aspects of new media artworks, to the conservation of past and present: the Gallery Spaces Panels create a comprehensive picture of the media art market 2019.

Music Monday

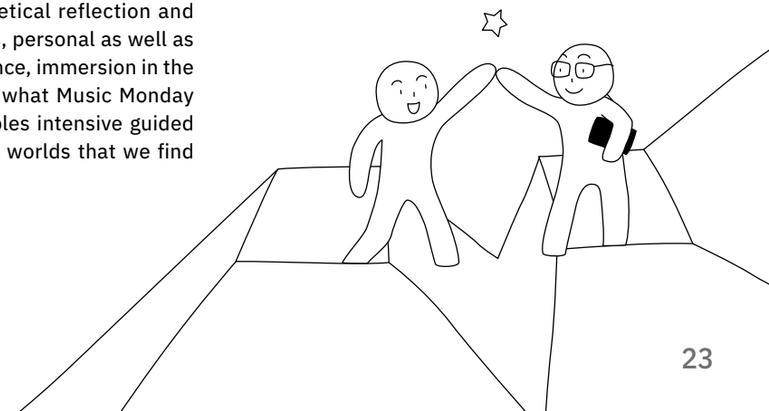
The Sound Art Parcours "Music Monday" is a longstanding Ars Electronica tradition. The tour passes through the diversity and plurality of the relationship spaces of music/sound art and the media arts. Theoretical reflection and discussions with the artists, personal as well as individual physical experience, immersion in the mediality of sound: this is what Music Monday stands for, because it enables intensive guided encounters with the sound worlds that we find at the Festival.

Music Research Lab

A coalition of Austrian musical institutions and initiatives is producing an encounter with the future prospects of young Austrian musicians. This Open Lab is an outgrowth of Music Summit, a working group formed at the 2017 Ars Electronica Festival; now, two years later, they've put together a program for musicians, teachers and musicologists. The emphasis is on the future of the music industry and musical training. Considering these two systems jointly is meant to provide a better overview and more profound insights for musicians. Free from any restrictions of genre or style, music will revert here to one of its original functions: an ambassador of emotions providing the various projects with sounds that may both irritate and amuse.

Campus Forum

This year, for the second time, a selection of universities will not only present their work in a special Campus exhibition, but also host their own discursive format — the Campus Forum Conferences. In the panels, a variety of universities will discuss the future of media-arts education. What are the crucial skills and aspects for the coming generations of artists in light of today's developments? Come and join the debate to learn more about the individual approaches of the different universities.



Guest Conferences

Innovation Forum GET.Inspired

(in collaboration with Wirtschaftskammer Oberösterreich)

The power of individual technology groups and their sole shaping of the future is increasingly subject to criticism. We are called upon to critically question and actively participate, instead of remaining passive victims of digital change.
At the *Innovation Forum GET INSPIRED*, the day for focusing on the economy at this year's Festival, people and companies show how thinking against the grain and leaving the comfort zone can lead to new, unthought-of of paths.
Ars Electronica sees itself not only as a stage for pioneers in art and science, but also as a forum that promotes an open dialogue and seeks to initiate a broad discourse.

Scientist in Residence Programme

(a collaboration between Ars Electronica, BOZAR, Gluon, the Serpentine Gallery and several universities and research institutions)

The Gluon *Scientist in Residence Programme* is designed for a new generation of scientists interested in collaborating with artists. The program encourages renowned contemporary artists to host a scientist or researcher in the independent and inspiring environment of their studios, reversing the usual approach where artists are invited to work at the R&D departments of universities or companies. Our intention is to challenge the hierarchy between the arts and empirical sciences that was predominant in the twentieth century, and challenge technological and scientific determinism by enabling artists to input experimentally creative, critical and societal ideas.
The conference will present the program as well as the outcomes of past residencies.

STARTS Day

(in collaboration with the European Commission)

The STARTS Day focuses on the STARTS Initiative of the European Commission and offers insights into collaborative practices at the intersection of art, technology, science and industry. In different discursive formats and presentations, extraordinary examples from this field are presented and their implementations, methods and impacts identified. One of the main focuses of STARTS Day will be the connection between AI and music; another, the practical issues around STARTS collaborations and their impact, as well as the education through Regional STARTS Centers and the creation of suitable legal frameworks for interdisciplinary innovation projects. Within GET.Inspired, promising start-ups and established companies are presenting creative forms of innovation. The STARTS Prize'19 winners will reveal their approaches and perspectives, working methods and results at the STARTS Talks. Last but not least, the STARTS Day will conclude with an exploration on humanizing AI.

Co-Thinking the Renewal of Fashion

(in collaboration with Re-FREAM)

Emerging new technologies are changing the way how fashion is produced and thus facing the criticism that the fashion industry is currently experiencing. Tech-driven solutions can positively impact our planet.
Within the Re-FREAM project, 10 international artists are using innovative technology for re-thinking fashion together with technologist in an ART-TECH collaboration. In our panel artists and scientists will share their perspectives on future developments in the fashion industry, talking about responsive fashion, future materials and the fashion production system. Furthermore, our session gives insights into the Worth Partnership Project supporting the creation of cross-border and cross-discipline collaboration between fashion and design, technology, crafts, and manufacturing companies.

Academic Design Network Austria — Discursive Formats

The student projects presented in the Campus exhibition of the *Academic Design Network Austria* form the point of departure for impulse lectures, fishbowl discussions as well as workshops such as a speculative design lab.
Day one aims to outline different approaches to the field of design.
Day two focuses on how technological advances (e.g. machine learning) transform working modes, task areas and perspectives in the field of design.
Day three discusses implications of the insights gained for design research and teaching, especially focusing on the skills and knowledge necessary to deal with the rising complexity of contemporary challenges.

We are not alone! Bauhaus100 PANEL

The panel introduces lecturers who in recent years have devoted themselves to arts education that straddles the humanities and the natural sciences. The experiences gained through this examination of science and art find expression in an original theory as well as in the artistic practice of students, sometimes over several generations.
We would like to take the time for a critical inventory that not only leads to skepticism, but also to a change in the design of cultural technology. Teachers from various disciplines will explain approaches developed from the encounter of art practice and theory at art colleges.
The focus is on the adventures and visions that manifest themselves 100 years after the euphoria of the Bauhaus.

Furthermore, Bauhaus also organizes the PhD Panel "slow algorithms and the hazards of standardization", which takes their 100-year anniversary to critically reflect on the cultural, educational, political, and economic standardization of art and design in society today.

Concept *We are not alone! Bauhaus100 PANEL*: Ursula Damm
Concept PhD PANEL *slow algorithms and the hazards of standardization*: Alexandra Toland

Perspectives of Political Studies

Let's argue. Conflict culture in the age of digital battlefields

Conflicts and fights have been with humanity since primeval times. In an ideal case they are a prime mover for societal development, in the worst case they set free destructive powers of incommensurable strength, combined with human suffering and ecological, economic, and political catastrophes.
The symposium seeks to investigate the degree to which social media can contribute anything to a new culture of conflict and fighting or if these media obstruct such a culture, whether digitalization has changed communication, cooperation, and opportunities for manipulation and, last but not least, whether new forms of conflicts would emerge through the digital transformation of society.
In lectures and workshops, new socio-political repercussions are demonstrated and discussed on various levels.

An event produced jointly by the Upper Austria Teacher-Training College, Upper Austria Chamber of Labor and Ars Electronica

ZusammenHelfen Conference

This is the fifth consecutive year that Zusammen-Helfen — Working Together in Upper Austria for Refugees is hosting a conference for all those who are committed to and interested in helping people forced to flee, or are affected by refugees and integration.
This year's conclave entitled "Day of Encouragement" will scrutinize new prospects, discuss the latest developments and challenges, and elaborate on successful projects.

Sonic Saturday — "Medium Sonorum"

The *Medium Sonorum* computer music matinée at the CMS Sonic Lab, Anton Bruckner University's 24 channel concert hall opens AIxMusic's second festival day. It presents recent works by Tobias Leibetseder, Astrid Schwarz and Tania Rubio, as well as a rarely performed classic, the '36 enfilades pour Piano et Magnétophone' by Luc Ferrari with Kaori Nishii at the piano and Angélica Castelló on the mixing desk. Erik Nyström presents his live computer music work *Texton Mirrors* using machine learning, spatially distributed feedback networks and 'topographic' multichannel synthesis processes to customize its canvas of sound to the loudspeaker environment of the Sonic Lab.

ZusammenHelfen Conference, © Tom Mesic

Workshops

CyberRäuber-Workshop

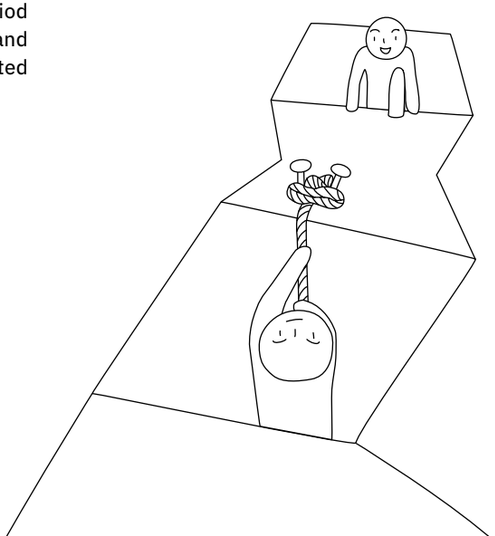
Since 2016, Marcel Karnapke and Björn Lengers work together as CyberRäuber, bringing theatre into VR and VR into theatre. They do artistic research into new narratives, virtual stages, recorded and real-time acting on stage and VR. Their work is shown as repertoire pieces at several theatres and international festivals. In addition to showing their first interactive VR opera Fragments | a digital Freischütz, the CyberRäuber give a hands-on workshop with exclusive insights into VR theatre.

BR41N.IO Hackathon

Brain Hackathons are brainstorming and collaborative marathons designed to rapidly produce working prototypes. At Ars Electronica 2019, BR41N.IO, organized by g.tec, brings developers, technologists, engineers, students, artists, and scientists together in teams of five participants each over two days to cram and build solutions that they can present. Hence, the Hackathon provides an environment for innovation and entrepreneurship. By putting creative minds from multiple disciplines together for a short period of time, we have the opportunity to discover and uncover new possibilities for using BCI-related hardware and software.

European Platform for Digital Humanism — Workshops

The Saturday of the festival features a workshop series in the framework of the European Platform for Data Humanism. At first, Caroline Sinders' (US) Feminist Data Set will adress questions about collecting data as an artwork and as a form of protest. Charlotte Jarvis (UK) will then invite a selective group of twelve women to participate in a ritual for populating history without patriarchy, also a starting point for *In Posse*: an ambitious art project to produce female sperm as an act of liberation. Bjørn Karmann and Tore Knudsen, winners of the STARTS Prize'19 for Artistic Exploration, will show visitors how to design their own *Alias*, a parasite that hacks your smart home assistant. 300.000km/s, an interdisciplinary urban innovation office, will involve participants in a discussion around liveability in the context of urban planning and will show methodologies applied in their innovative urban planning project *Ciutat Vella's Land-use Plan* in Barcelona that was awarded with the STARTS Prize'19 for Innovative Collaboration.



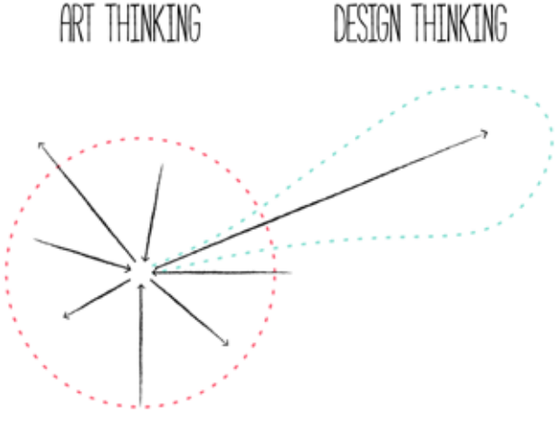
ART THINKING SCHOOL 2019

Tom Mesic

Ars Electronica Art Thinking School

“Art is a catalyst for shaping a better future society.”

The Ars Electronica Art Thinking School is a new festival program consisting of inspirational tours, lectures, talks, workshops and exhibitions aimed at inventing a better future. Using the “Art Thinking” approach connects creators, industries, governments and citizens by cultivating a creative mindset of questioning the world. We believe that art and artistic thinking is the best way to understand even the most complex issues and systems created by humankind — be they societal, economic, political, or technological. Art holds the power to scrutinize existing beliefs, cast doubt on common perceptions and find a way to think outside the box.
The Ars Electronica Art Thinking School aims to empower participants to take on the various societal and technological complexities facing us in today’s fast-paced and fluctuating environment.
Whether it is through unearthing fundamental “Creative Questions” in the annual Future Innovators Summit, exchanging ideas and convictions on the platform of the Ars Electronica Festival, being guided through specially prepared thematic courses at the Festival exhibitions and venues, or actively designing future scenarios in one of the Art Thinking School workshops, alumni of the Ars Electronica Art Thinking School apply Art Thinking to the challenges of present-day life — and that of the future.



Future Innovators Summit 2019

The *Future Innovators Summit (FIS)* is an intercultural workshop format which was initiated in 2014 and has since developed into the key think-tank program during the Ars Electronica Festival.
At this summit, young and experienced professionals from different cultures and backgrounds — such as artists, designers, scientists, engineers, entrepreneurs, social activists and philosophers — gather to intensively discuss and rethink the pressing issues we face, and to create future scenarios for a better global society. This workshop, jointly developed by Ars Electronica Futurelab and Hakuhodo — a leading communication design firm in Japan — offers time and space to think, and aims first and foremost to look for an ultimate Creative Question that will lead us to think about missions and actions, rather than merely finding solutions for the commonly known problems.

This year, participants at the summit will discuss the following topics:

FUTURE TRUST

Trust is a "Societal BOX" of solid belief, on which human beings have built mutual relationships even in the midst of social upheaval or technological transitions.
The digital revolution has changed the way information is created, published, and shared, to the point where it is undermining the legitimacy of authority and calling into question the role of media. Popularization of the concepts fake news and alternative facts has seriously shaken our common ground of "trust for information." Still, people enthusiastically put sensors everywhere, monitor everything from biometric signals to political orientation, and feed digital information to AI to explain the laws governing social behavior.
Are we making society more secure, or more vulnerable? Can the data-based society generate more trust, or take us into a nightmare of mutual surveillance? Will a system like blockchain become the savior that frees us from the black box, and wins back trust? Or will it end up as a tool to justify a nationwide social credit system?

How do we believe in TRUST in the 21st century?

FUTURE BODY

The body is an "Organic BOX" that confines the human mind, brain, and internal organs throughout life.
The digital revolution opened up new possibilities for transcending our physical presence, which led us to create the modern technology of telecommunications or human augmentation. The evolution of biotechnology brought a whole new dimension to life science, blurring boundaries between natural and artificial life forms. It is altering the definition of our body, as well as our views of life and death.
When the world becomes a hybrid of organic and secondary nature, how do humans create a new culture, fashion, and lifestyles? Does our spirit still reside in our physical body? Or does it transform into a ghost freed from natural laws, and travel in space at the speed of light?

How do we find meaning in BODY in the 21st century?

FUTURE HUMANITY

Humanity is a "Philosophical BOX" which human beings have discovered in the course of living together with nature and technology throughout history.
The digital revolution, which accelerates the technological innovations that can create alien beings such as robots and AI, now requires us to update the idea of humanity boxed in classical philosophy.
How do we see our different selves when we separate our sense of being from that of robots — Robotinity — or that of AI — The other I — ?
What should only humans do? What will only humans be able to do? Where does our free will go, in a fully controlled society? How will our neo-humanity evolve in the future? What will a sanctuary of the future be?

Ultimately, how can we be more HUMAN?

Text by Hideaki Ogawa, Vanessa Graf & Carla Zamora

People Thinking Lab 2019

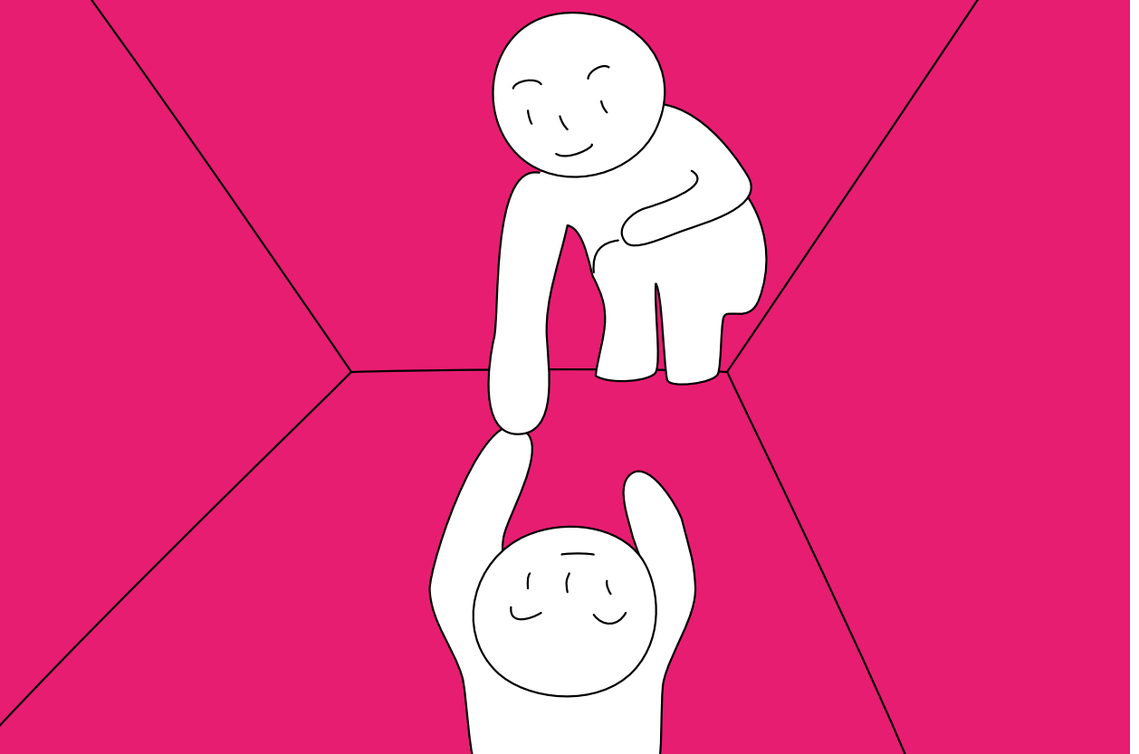
Hakuhodo, Hakuhodo i-studio Inc.

People Thinking Lab is an open and experimental laboratory initiative for empowering people to envision our future society with unique workshops and tools. The People Thinking itself originates from Hakuhodo's philosophy, "the philosophy of sei-katsu-sha (living people) insight." It aims to co-create a better society where people are defined, not as consumers and marketing targets, but as co-producers and individual beings. At Ars Electronica Festival, the Lab shows a new collection of the latest tools and workshops developed together with Hakuhodo i-studio Inc. for supporting People Thinking. Moreover, this laboratory will play an important role in the process of extracting creative questions for Future Innovators Summit, by getting input from visitors to the festival.

Producer: Yasuyuki Imai (JP)
Assistant Producer: Muu Narioka (JP)
Art Director: Yosuke Kouno, Mariko Ito (JP)
Designer: Takayasu Sagawa (JP)
Technical Director: Masakazu Kawazu (JP)
Programmer: Koyo Arai, Naoto Tanaka (JP)
Total Produced by Rena Tanaka (JP), Masahiro Oie (JP)

40 YEARS ARS ELECTRONICA

ARS and the CITY
ARS on the WIRE



Since its inception in 1979, Ars Electronica has remained true to its core value of connecting the realms of art, technology, science and society. Today, 40 years later, Ars Electronica is one of the leading institutions in the field of media art, not only deeply rooted in the public sphere and cultural landscape of Linz, but also an important link to the international community. With a variety of formats and initiatives, Ars Electronica traces current processes and developments in art, technology and society and makes them accessible to the general public. Presence in public space is therefore one of its most important aspects: interdisciplinary projects regularly invite regional and international visitors to engage with current issues, visions and possibilities.
The following article gives a preview of the first chapter of the new 40th anniversary publication *Creating the Future. A Brief History of Ars Electronica 1979 – 2019* written by Andreas J. Hirsch.

Andreas J. Hirsch (AT)

Creating the Future. A Brief History of Ars Electronica 1979 – 2019

Excerpts from the first chapter “The Founding Years of a New Festival 1979 – 1986” of the 40th anniversary publication

Put Your Radio in the Window: A Festival Emerges From a Cloud of Sound

Ars Electronica’s entrance into the world was no less than grand. On the evening of September 18, 1979 a crowd of around 100,000 people – approximately half of the city’s population – had gathered in the park on the banks of the Danube in front of the city’s concert hall, the Brucknerhaus. It was a mild evening after a mostly sunny early autumn day. The opening event had been the talk of the day. Traffic collapsed since nobody had expected such a huge crowd to turn up. At five minutes past eight, the first movement (Allegro Moderato) of Anton Bruckner’s *Symphony No. 8 in C minor* commenced flowing along the river. The event had been announced as a “cloud of sound” that would eventually cover the entire city of Linz. This was to be achieved via a massive sound system at the Danube park (Donaupark) and on the opposite bank of the river, as well as additional speaker systems at four remote, elevated positions in the city and – maybe most importantly – via regional radio.
On the day before the opening, Monday, September 17, 1979, a very unusual “special guest” had arrived at the airport of Linz: The mayor of Linz, Franz Hillinger, had come to the red carpet rolled out at the city’s small airport to officially welcome “SPA 12,” a robot that had flown in from New Jersey, USA. SPA 12 looked very much like the robots familiar from science fiction movies and spoke with a somewhat squeaky, metallic voice. He graciously greeted the population of Linz and held the opening speech at Ars Electronica on September 18. He even mingled with the crowds on the city’s main shopping street (Landstraße), responded to questions from people phoning in to a live radio

broadcast, and was the star of a late night TV discussion show Club 2. As this was late 1970s robot technology, SPA 12's movements were, of course, remote controlled and his quick-witted answers came from a human companion not far away. But the message that Ars Electronica sent out was nonetheless clear: Linz welcomed this emissary from the future with open arms.

Those two events marking the inception of the first Ars Electronica Festival — the massive "Cloud of Sound" (Klangwolke) and the arrival of the robot SPA 12 — were in fact well-planned parts of a bold and visionary concept. When the composer Hubert Bognermayr — a pioneer of electronic music and founder of the rock band Eela Craig — approached Hannes Leopoldseder, regional director of the Austrian Broadcasting Corporation ORF, to cooperate in an event of electronic music, it immediately sparked his interest. But Leopoldseder quickly advocated a grander design: It should not merely be a concert plus a small symposium, but also a large-scale event in public space.

And the project should not limit itself to electronic music alone, but expand to other areas of creativity where microelectronics were beginning to be applied in artistic creation.

The symphonic open-air performance on the banks of the Danube was based on a quadrophonic recording of Bruckner's last completed symphony by the Concertgebouw-Orchestra conducted by Bernhard Haitink. Music producer Ulli A. Rützel negotiated the rights for this unusual use of the recording. Bruckner's music was to be accompanied by a laser show focusing on a huge balloon covered with shimmering hearts. The composer and sound-architect Walter Haupt had been brought in from Munich to conceptualize this open-air event due to his previous experience with filling large outdoor spaces with floating sound. However, the organizers' plans were affected by some unexpected factors: The huge crowd somewhat reduced the audibility of the music in some parts of the Donaupark and during the concert the balloon was pulled down to the ground by members of the audience, who grabbed the shimmering hearts. The German chemist and photographer Manfred P. Kage provided another kind of visualization of Bruckner's music by transferring the sound waves from a loudspeaker to liquids and a diffusing screen — an analog precursor of future digital media art concepts. In the days preceding the opening event of this first Ars Electronica Festival, the population of Linz had been encouraged to participate in this "musical Bruckner experiment": People were asked to turn on their radios at the time of the event and place them in their open windows, thus helping spread the "cloud of sound" across the city. Most of them did not even have to switch radio channels, since that evening Bruckner's symphonic work was broadcast on the highly popular regional program, which usually featured folk music. The taxi drivers of Linz followed the call to turn on their car radios, tune into the program, and drive with their windows open. So on that memorable evening the city came to life with numerous sources of the same sound of Bruckner's music, some of them in the facades of the buildings, some of them cruising through the streets of Linz.

[...]

The Birth of Ars Electronica from the Spirit of Computer Music and Computer Graphics

When Hannes Leopoldseder — inspired by the artistic impulse of musician Hubert Bognermayer — plotted out his ideas of a festival dedicated to art, technology, and society, he immediately went on to look for someone to bring in the necessary expertise in the field of microelectronics and art. So he went to Vienna and did some research on the topic in the Austrian National Library, situated in the compound of the former Royal Palace of the Habsburgs. Spending the day in the historical ambience of the old reading room of the National Library, he worked himself through his two main findings. Those were books by the Austrian scientist Herbert W. Franke (*1927), both a specialist on computer graphics as well as a writer of science fiction novels. Franke turned out to be pioneering in the still young encounters of microelectronics and art and could also provide the theoretical foundations required. Franke had summarized his artistic work in computer graphics so far as "Ars Ex Machina." When later driving to visit Franke at his home near Munich, Leopoldseder came up with a name for the new festival he was preparing: Ars Electronica.

There can be little doubt that Leopoldseder's humanistic education and his familiarity with the languages and cultures of classical antiquity informed this choice of name for the new festival. Young Hannes Leopoldseder had attended a private Catholic secondary school — the Petrinum in Linz Urfahr — that was regarded as an elite institution. The curriculum included nine years of Latin and six years of ancient Greek. The Petrinum, which also has its own observatory, is housed in an impressive historical building residing on the slopes of the Pöstlingberg hill above Linz. From there it is a mere 15-minute downhill stroll to the site of the first Ars Electronica Center, where some four decades later Hannes Leopoldseder's vision would become reality.

When pondering the term "Ars Electronica" we may recall the "seven liberal arts" (artes liberales) which included the four 'scientific' disciplines — music, arithmetic, geometry and astronomy. In ancient Greece as well as in Roman antiquity these "arts" were considered to be essential elements of any higher education. Today we have reason to think of the different areas of expertise and the various skills involved in "Ars Electronica" as essential to prepare us for the future and enable us to actively shape this future. Such references to historical concepts, in this case from classical antiquity, are also typical for Leopoldseder's way of thinking, which combines a strong focus on the future with a profound knowledge of our cultural heritage.

Leopoldseder wrote his PhD thesis in 1973 on the topic "Grotesque World: A Contribution to the History of the Development of the Nocturne in Romanticism." The choice of 19th century composer Anton Bruckner, a Romantic, for the first Klangwolke might not only suggest a logical strategic decision for the most prominent composer from the province of Upper Austria; it could also be seen as inspired by Leopoldseder's broad range of cultural topics of interest.

When approached by Leopoldseder, Herbert W. Franke — who was 52 at that time — not only agreed to collaborate but also swiftly helped define an exhibition and a symposium and thus create important constitutive elements of the first Ars Electronica. Franke is a polymath, who had dedicated himself to a diverse field of studies from physics, mathematics, and chemistry to psychology and philosophy, and he obtained his PhD in physics from the University of Vienna in 1950. In 1968 he had joined the "group parallel", formed by artists and scientists who considered science, technology, society, and art as phenomena linked together in feedback loops. Since 1973 he had been teaching courses on "cybernetic aesthetics" at LMU Munich. His work in the field of computer graphics can be found today in art collections like the one in the Abteiberg Museum in the German city of Mönchengladbach. So Leopoldseder, who had come across Franke's books on 'computer art' and 'apparative art' at the National Library, clearly had identified the right person to share his vision of a festival at the crossroads of art, technology, science, and society.

[...]

Text: Andreas J. Hirsch
Publication: *Creating the Future. A Brief History of Ars Electronica 1979–2019*; Hatje Cantz, Berlin, 2019

ARS and the CITY

A retrospective of the activity and impact of Ars Electronica in, with and for Linz: Ars Electronica's art, media and participation projects in public space — from 1979 to the present day.

"No other Austrian city has undergone such dramatic economic, social and demographic change in the 20th century as Linz. For decades, the city's image was almost exclusively determined by heavy industry. For 40 years, Linz was the heart of the Austrian steel industry — the steel city," wrote Siegbert Janko, longstanding and influential cultural director of the city of Linz, about the special conditions of cultural policy in Linz at the end of the 20th century.

His description also relates to an important and formative starting point for the emergence and development of Ars Electronica: a city in transition that saw art and culture as an important force in shaping its future opportunities.

It is one of the founding myths of the unique Ars Electronica project that it came to life as a festival for art, technology and society — as an initiative of the City of Linz and the ORF — to initiate, accompany and support the transformation that the city urgently needed at that time. Computers and microelectronics were obvious economic prospects for the future of an industrial city. From the very beginning, the importance of social and cultural aspects was recognized and taken seriously, an extraordinary and special aspect that was certainly also due to the influence of Ars Electronica co-founder Hannes Leopoldseder.

It is therefore only natural that Ars Electronica has been working in and with the city with a great deal of energy and enthusiasm from the very beginning, repeatedly mobilizing considerable resources for this purpose. It quickly turned out that media art was particularly well suited to breaking out of the established venues for showing art and mediating culture. It allowed artists to the public sphere in a distinctive way or, even better, to create their own public sphere.

The later orientation of the Ars Electroncia Center as a "museum and school of the future" and its broad positioning as an art, education and research institution today are a logical consequence of these early developments.

The exhibition divides the huge multitude and variety of projects and initiatives in the public space into four thematic sectors: Donaupark, Hauptplatz, Voest, Stadtwerkstatt.

The Donaupark not only symbolically stands for the city as a living space, but is also the starting point of this exciting journey, as the Linzer Klangwolke was also invented in 1979 for the opening of the first festival. In its founding year, it was not only a spectacular open-air concert, but also extraordinarily prophetic with its "Radio in the Window" project. Weeks before the Klangwolke, the people were invited to join the Klangwolke, or "cloud of sound," on Saturday evening by putting their radios in the window and creating a real Klangwolke throughout the country, far beyond the Donaupark. Thousands of people participated. From today's point of view this can be called a successful pioneer project of "Social Media," in which a medium is not only used to broadcast information or entertainment but to inspire action and let people participate on a large scale. Thirty-three years later, another world premiere took place: In 2012, for the first time, 50 drones flying as an autonomous swarm rose in the Donaupark and created a unique show, a development of the Ars Electronica Futurelab that gained attention all over the world.

The Hauptplatz is one of the most frequent locations for projects in public space and many residents of Linz still remember the project *Audience Participation* by Loren Carpenter in 1994, in which 4000 people were able to play "Pong" together on the Hauptplatz. But the Hauptplatz as a thematic sector of the exhibition also stands for the important and active role of the city administration without whose intensive support many of these projects would not have been possible. Until today, a "by-product" of what has been perhaps the largest participation project in the history of Ars can be found in the entrance hall of the Linz Town Hall. In 2007, a photo flyover

Ars Electronica 1991 — Stadtwerkstatt TV
Niemand ist sich seiner sicher

Klangwolke 1979, © ORF

Ars Electronica 1996 — 2000, Ridin' a Train — eine musikalische Nachtfahrt mit dem Zug durch das Werksgelände der Voest, © Rudolf Brandstätter

Ars Electronica Festival 1994 — Alles Spiel, audience participation, © Felix Nöbauer

over Linz was organized and publicly announced, inviting the population to set visible signs in their gardens, on their roofs, on business premises and in parks. The result — a huge aerial photograph of "Ganz Linz" — was subsequently integrated into the floor of the entrance hall of Linz Town Hall and is still being updated by the city administration. It is also very popular — people come to the town hall especially to see and explore their city.

The third thematic sector is "Voest." The huge company premises, founded as Herman Göring Werke during the Second World War, were the economic engine of the city soon after the war, shaped the identity of Linz as a steel city for decades, and today remain a sign of Linz's success as a location for modern technology.

Voest not only appeared as a theme of the Ars Electronica Festival from the very beginning (steel symphony, steel opera ...), but also as an iconic venue for unusual projects. It's hard to imagine, but in the early 1990s there was also an artists' group named "Contained" that had moved into a quarter in the middle of the Voest area. It gave rise to the collective "Times Up," which is still successful today. The nocturnal musical train rides through the Voest area, organized by Wolfgang "Fadi" Dorninger for the festival from 1996 to 2000, are also legendary.

The fourth sector is dedicated to the role of the independent scene, based on many of the Stadtwerkstatt projects that took place as part of Ars Electronica. The Stadtwerkstatt, today the oldest autonomous cultural center in Linz, was also founded in 1979 and was the starting point of a vital artist scene in Linz that played a decisive role in shaping the way from the steel city to the cultural city and still has an important influence on the festival today.

The term "Hundesprengung" (Engl. blasting dogs) is still used by many to refer to the city's major cooperation project with ORF-OÖ at Ars Electronica 1991. The "Bug Race" of 1997 or, most recently, the "Turnton Docklands" of Times Up 2016, are also examples of this influential and fruitful interaction. Looking at the broad spectrum of creative and innovative players active in Linz today, many of whom are now anchored far beyond Ars Electronica in the city's universities or have completed projects such as building a hub for the economic value creation of creative work in the former tobacco factory, confirms the courageous founding idea of Ars Electronica: to include art and culture as a catalyst in the transformation of the city, which is also a great opportunity for the challenges of the coming decades.

ARS on the WIRE

How artists started to explore the social dimension of the electronic space.

Long before the Internet began to attract widespread attention in the form of the WWW and before a young generation of artists began to critically examine the structures, peculiarities, and future possibilities of this new medium under the term “Net Art,” telecommunications art projects began to take place (from the late 1970s onwards) dealing with global networking. From the outset, Ars Electronica was a venue for this pioneering artistic work.

One of the now legendary early projects took place at Ars Electronica in 1982: “The World in 24 Hours” organized by Canadian/Austrian artist Robert Adrian, together with a large number of international partners. For an entire day and at every hour, the ORF regional studio in Upper Austria produced telecommunicative situations online, each with a different location in the world, using all available possibilities. The aim was not to create works of art, nor was it to create performative situations, but to be connected, to establish electronic space as a place of encounter and exchange — in other words, to try out exactly what is now our everyday life with social media.

Using documentary material from the archives of Ars Electronica, Ö1-Kunstradio and Outerspace by Doug Jarvis, the exhibition attempts to trace the peculiarities of these early projects.

Another section of the exhibition is devoted to the visionary media projects from the 1980s by Van Gogh TV, the Linzer Stadtwerkstatt-TV, Radio Subcom, and the many projects that were created in cooperation with the Ö1 art radio station in the 1990s.

A separate part of the exhibition is dedicated to physical telepresence. It very quickly became an interesting field of artistic exploration, since the aim was to combine the virtuality of digital space with our physical reality, to extend the human-computer interface beyond the distance of the telematic connection, and to be able to become active and directly affect both realities at the same time. Documentary materials from “Telegarden” (1996), from “Bump,” the telekinetic wooden bridge between Linz and Budapest from 1999, or from the projects Hiroshi Ishii presented at the festival since 1997, prove the fascination of this collaboration between art and technology.

Another exhibition area will also be dedicated to the beginnings of “Net-Art.” It presents exemplary projects and protagonists such as Etoy, Radio TNC, Ricardo Dominguez’ *Digital Zapatismo* as well as the many winners of the relevant Prix categories for Net-Art and later for Digital Communities.

What makes all these projects so exemplary from today’s point of view is that artists did not approach the new technical reality as a tool with which they produce their art(s), but recognized that the real impact of digital networking lies in the fact that it creates a social space; and they saw it as their task to examine the cultural and social effects of this development.

On behalf of society, artists claim their place with these projects, claim their participation in the emerging electronic space, which has been above all — unfortunately — a monopolized commercial space, both then and now.

The fact that we still today, to extent perhaps greater than 40 years ago, lack a real public sphere in the digital networks, instead tolerating an almost feudalistic arrangement within the latifundia of the digital landlords, whose arbitrary rules we are subjected to, is probably the gravest failure so far of our path into the digital age.

The World in 24 Hours, © Sepp Schaffler

Telegarden, source: PILO

Bump, © Sabine Starmayr

etoy © N

Van Gogh TV

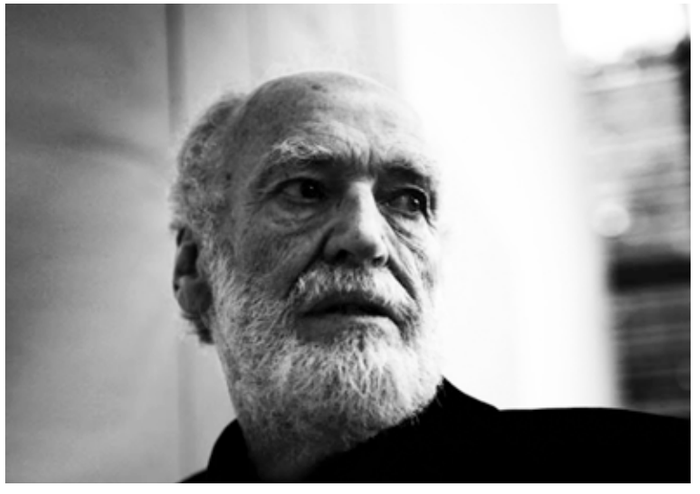
Roberto Paci Dalò (IT)

Long Night Talks. For Robert Adrian

TONSPUR 75_lost

Long Night Talks. For Robert Adrian is an 8-channel sound work. The piece is dedicated to Robert Adrian X (1935—2015), a pioneer in art and telecommunications. The Canadian artist lived in Vienna since 1972, and for more than two decades, Adrian and Paci Dalò shared a close friendship while working together on several projects; among them, a film Paci Dalò created especially for Adrian's major retrospective at Kunsthalle Wien. The two used to sit in Adrian's studio in the Wiedner Hauptstrasse and share long night talks in which they passionately discussed art, radio, transmission, technologies, the web, surveillance, sound, warfare, and conflict. In *Long Night Talks. For Robert Adrian*, Roberto Paci Dalò worked with Adrian's voice, using it as main material for the installation, which also includes field recordings, instrumental and electronics sounds. This work was created in 2017, during a residency at TONSPUR — Q21/MQ MuseumsQuartier Wien.

Idea, composition, images: Roberto Paci Dalò
Voice: Robert Adrian
Bass clarinet, clarinet, electronics: Roberto Paci Dalò
Contra-alto clarinet: Susanna Gartmayer
Guitar, electronics: Fennesz
Piano, electronics: Robert Lippok
Installation set up: Peter Szely
Technical collaboration: Stefano Spada, Andrea Felli
Text: Lucas Gehrmann (Kunsthalle Wien)
Recorded by Robert Lippok at Farmhouse Studio Rimini
Production: TONSPUR Kunstverein Wien, for the series TONSPUR für einen öffentlichen raum
Artistic director: Georg Weckwerth
In collaboration with: Ö1 Kunstradio, Giardini Pensili, Usmaradio
TONSPUR-Artist-in-Residence at Q21/MQ in 2017



Archive Giardini Pensili

Robert Adrian X (CA/AT)

The World in 24 Hours

In 1982 this telecommunications program attempted to combine SSTV, computer communication and telefacsimile in a global multimedia telecommunication project. The conceptual intention of *The World in 24 Hours* focused on demonstrating the global nature of electronic networks—as well as the fact that most of the globe was missing from the network (all of Africa and South America and most of Eastern Europe and Asia), and to challenge the hegemony of the one-to-many broadcast media by using the telephone system for one-to-one multimedia interaction. Another aspect was the attempt to make a statement about a new role for the artist in the age of electronic media as a creator of the space for art rather than as a mere a producer of objects.
During the project artists around the world connected in a non-stop series of dialogues beginning at 12 noon on September 27 and ending at 12 noon on September 28, 1982 (Central European Time).

Sepp Schaffler

Bill Bartlett (CA), Doug Jarvis (CA)

Interplay; Exploring Telecommunications, Art, and Collaboration, 1978 — 1983

Artist Bill Bartlett and Open Space Guest Curator, Doug Jarvis, present archival materials that detail and support the international telecommunications projects that Bartlett developed between 1978 and 1983, and which contributed to the context in which Robert Adrian X's *The World in 24 Hours* takes place. From his homes in Victoria and Pender Island, BC, and with the Open Space gallery, Bartlett initiated projects and collaborations that made use of early computer email, slow-scan video and satellite networks to bring together artists from all over the world to build networks and collaborative projects that set up the context for our current global internet culture.

This project is supported by the Open Space Arts Society, Victoria, BC, Canada.

Slow Scan, Bill Bartlett, Open Space 1978, © Open Space Archives

VGA Gallery (US)

Chicago New Media 1973 — 1992

Chicago New Media 1973 — 1992 chronicles the under-recognized story of Chicago's contributions to new media art by artists at the University of Illinois at Chicago's Electronic Visualization Laboratory, the School of the Art Institute of Chicago, and at Midway Games and Bally from 1973 to 1992. The exhibition features video game artifacts, new media technologies, historical photographs, game stills, playable video game consoles and virtual reality modules. Consisting of an exhibition, public program and scholarly catalog, the project yields a new, art historical understanding of the Chicago-based artists and organizations that contributed to digital art and technology in the latter half of the twentieth century. The exhibition is curated by Jon Cates, Associate Professor of Film, Video, New Media and Animation, Art History, Theory and Criticism at the School of the Art Institute of Chicago, and organized with the curatorial assistance of Chaz Evans and Jonathan Kinkley.

The touring presentation of *Chicago New Media* is generously supported by the Terra Foundation for American Art and the Austrian-American Partnership Fund of the U.S. Embassy in Austria. The Chicago New Media exhibition, public program and catalog was organized by VGA Gallery in partnership with University of Illinois at Chicago's Gallery 400 with support from Electronic Visualization Laboratory. *Chicago New Media 1973 — 1992* is part of Art Design Chicago, an exploration of Chicago's art and design legacy and an initiative of the Terra Foundation for American Art with presenting partner, The Richard H. Driehaus Foundation. Additional generous support for this project is made possible by The Chicago Community Trust, the Goethe-Institut Chicago and the Video Data Bank at the School of the Art Institute of Chicago.

Clark Dodsworth 1976

Kiyoji Otsuji, *Cross Talk Intermedia* held at Yoyogi National Gymnasium, Tokyo, February 1969
© Seiko Otsuji, Musashino Art University Museum & Library

Atsuhito Sekiguchi (JP), Hiroko Myokan (JP), Minoru Noma (JP),
Keiko Kobayashi (JP), Ryoji Tanaka (JP)

Japanese Media Art Timeline Infographics Project

Japanese artworks at the PRIX ARS Electronica and Japan Media Arts Festival over the past forty years of Japanese media art activity

We are trying to build a history of Japanese media art from the event, with the artistic support of company Mesena (mécénat) and through the student-teacher relationships at the educational research institute. It will consist of an infographic that clearly displays the relationship between the winning projects at PRIX ARS Electronica and those at the Japan Media Art Festival.

Web site interface of the student-teacher relationship at the educational research institute: *http://bunkacho-person.semitra.com/en.html*

CANON INC.
Agency for Cultural Affairs, Government of Japan
Supported by Japan Media Arts Festival
Atsuhito Sekiguchi (AUA/JP), Hiroko Myokan (JP),
Minoru Noma (CDC/JP), Keiko Kobayashi (JP),
Ryoji Tanaka (Semitransparent Design/JP)

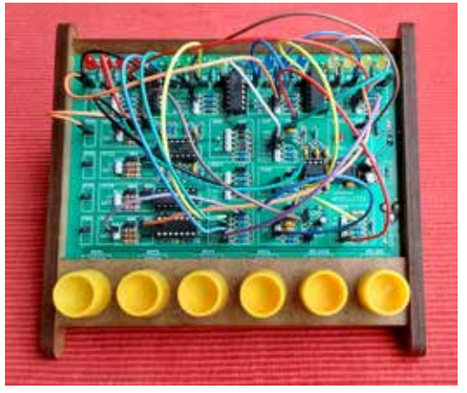
Wolfgang Dorninger (AT)

It started with Cassette Culture!

From K7 to autogenerative!

The *N D Magazine* from Austin, Texas, had the subtitle Content — Document — Exchange on the cover and under this motto, Wolfgang Dorninger also sailed since 1983 through the international waters of Mail Art with a focus on Cassette Culture. Countless letters, contributions in fanzines, long-lasting discourses, self-organized concert tours to other nodes and numerous transcendent cooperations created a network that, without a large master plan, had long-term and far-reaching effects on local music creation in Linz. In 1984 Dorninger performed for the first time at Ars Electronica with Monochrome Bleu. Later he also contributed to the Festival as curator and technical manager. “My main focus at ‘Ars’ was to present edged electronic music within the public space with formats like ‘Subtronic,’ ‘Ridin’ A Train,’ ‘Mego Loveboat’ or ‘Containerpark’ to mention some,” he explains. Based on his sonic history, Dorninger will present a sound installation at this year’s Ars Electronica Festival built on tape-loops, self-soldered autogenerative music machines, synthetic bird sounds and algorithmic soundworks with tactile speakers, horns and subwoofers to celebrate 40 years of Ars Electronica.

http:/dorninger.servus.at



Device Art 2019

PhD. Program in Empowerment Informatics, University of Tsukuba

Curator: Hiroo Iwata (JP)

Device Art is a new form of art that brings out the essence of technology through new materials and mechatronic devices. This concept challenges the traditional paradigm of art by merging technology, art and design.
Device Art possesses three main characteristics:

(1) The device itself is content. The mechanism represents the theme of the piece. Content and tool are no longer separable.
(2) Artworks are often playful and can sometimes be commercialized into devices or gadgets for use in everyday life.
(3) Refined design and playful features are traced back to the Japanese tradition of appreciating tools and materials. Traditional Japanese culture, such as the tea ceremony or flower arranging, uses sophisticated devices. These devices are the roots of device art.

The *Device Art* project was launched in 2004 together with *CREST* project funded by the Japan Science and Technology Agency. Hiroo Iwata leads the project, its formal title being, *Expressive Science and Technology for Device Art.* The concept of *Device Art* spread throughout the world, including artists from UCLA and a curator team from Croatia/Slovenia. Many people have been inspired by the concept of Device Art.
Ten years after, in 2014, Hiroo Iwata launched the PhD Program in Empowerment Informatics, or EMP for short. It is a five-year PhD Program at the University of Tsukuba supported by the Ministry of Education, Culture, Sports, Science and Technology.

This program aims to help students develop their careers and consists of the following three areas:

(1) Supplementation: Supplementing the reduced physical and sensory functions of elderly people or people with disabilities.
(2) Harmony: Harmonizing the engineered systems that people encounter in daily life (advanced mobility, etc.) so that they integrate with people.
(3) Extension: Drawing out and extending people’s latent creative abilities. It is closely related to Device Art.

EMP has a special “Empowerment Studio,” which is a combination of laboratory and gallery. Many Device Art works, including *Big Robot*, have been created in this studio. Based on the achievements of EMP, the *Device Art 2019* in Ars Electronica has been planned for celebration of its 15th anniversary.

Machiko Kusahara (JP)

Device Art Chronicle

The term “device art” is already part of the vocabulary of contemporary art. The *Device Art Chronicle* demonstrates how the concept was developed within the *Device Art Project*, aiming to explain the prehistory of media art, and how local and global features are connected. We were able to define features that characterize Japanese media art (e.g. playfulness), which can be better understood by relating them to earlier cultural traditions. Nevertheless, the essence of device art is also international and its features are shared by many works of media art.

Hiroo Iwata (JP)

Big Robot Mk.2

This video installation shows the largest movable robot in the world. Large humanoid robots, such as Gundam or Macros, are popular in Japanese animation and Manga. What if robots of this kind appeared in the real world? The existence of real large-scale robots may inspire the audience to be courageous. Thus, it has potential as an art form. The Big Robot Project aims to develop the world's largest rideable robot. The *Big Robot Mk.2* is an extension of the *Big Robot Mk.1* which was exhibited at Ars Electronica 2016.

Big Robot Mk.2

Yuta Kozaki (JP), Felix Dollack (DE), Takeshi Ozu (JP), Rina Katsube (JP)

El-Astrocade

Childhood obesity is a worldwide public health issue. It is reported that overweight children and young adults are more likely to stay obese during their life. To tackle this issue, we made use of gamified exercise and proposed the large projection game *El-Astrocade*. This game was originally implemented in the world's largest virtual reality system at the University of Tsukuba. It encourages players to be more active, while showing us how physical activity is enjoyable and fosters teamwork and communication.

El-Astrocade

Takeshi Ozu (JP), Aki Yamada (JP)

The Society of Stools [16]

In many crowded urban places, such as train stations, you often find yourself in a weird situation: everyone around you is at your arms' reach, yet they are strangers. *The Society of Stools [16]* is a flock of sixteen stools that move autonomously. The chairs escape and try to keep away from surrounding objects, including people. During this immersive experience, you may feel like you are one of them, or just feel isolated, since they are not willing to let you get closer.

Gluccie Collaborations (JP)

Virus Buster Offline — The marvels of Code Violet

The scene of *Virus Buster Offline* takes place in Japan in the near future. Through an avatar, people can dive into the Internet world, which has been infected by a brutal computer virus, Code Violet, which must be defeated by the players. The aim of this project is to allow participants to increase their physical activity by using elements of gamification. Participants wear an activity meter to collect points. With continuous participation, points accumulate and characters in the game evolve. This device art work combines the fields of medicine and art.

The Society of Stools [16]

Virus Buster Offline — The marvels of Code Violet

Maywa Denki (JP)

Zihotch

Zihotch is a wristwatch that announces the current time when the user dials “117.” The voice is programmable so that the user can hear various people announcing the time.

Maywa Denki (JP)

Solekit

Solekit is a craft kit that makes funny movements. It uses only one solenoid, driven by 5-volt power source.

Maywa Denki (JP)

Bunko Gakki

Bunko Gakki is a musical instrument that is the same size as a Japanese paperback (A5 size). The user can easily carry it. It has a modular structure that fits into a bookshelf.

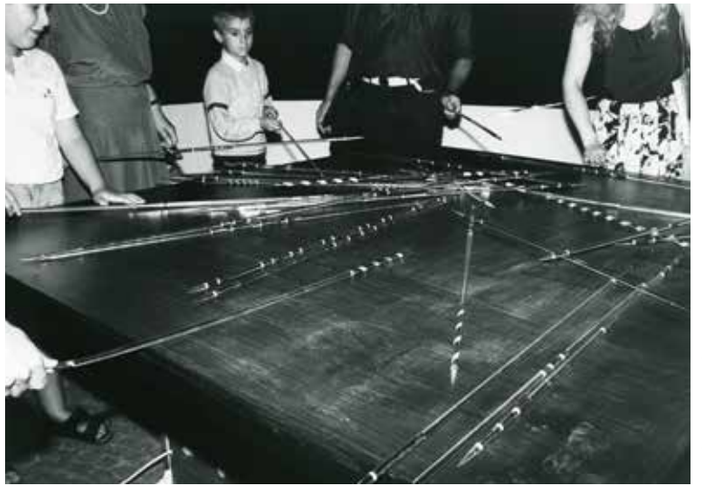
Waltraut Cooper (AT)

Klangmikado

Klangmikado, which was created for Ars Electronica in 1987, allows visitors to play with oversized mikado sticks and create individual sound worlds. The composition is by Gerhard E. Winkler. On the occasion of the exhibition “Waltraud Cooper Light and Sound,” which took place in 2017 at the Landesgalerie Linz, Cooper’s interactive work *Klangmikado* was reconstructed in cooperation with the Ars Electronica Center and made accessible to the public again.

This experimental sound sculpture comes from the “Digital Poetry” series, in which computers transform visual, linguistic and musical forms of expression into one another. The series was developed for Cooper’s contribution to the 1986 Venice Biennale, which was entitled “Art and Science,” and has since been shown in a variety of formulations. Since the 1980s, the *Klangmikado* has been presented at festivals and museums in Montréal, Boston and New York, among other places.

Waltraut Cooper — mathematician and artist — is one of the pioneers of digital art. The Linz-born artist has attracted international attention for several decades and was represented at the Venice Biennale several times.



Ars Electronica Archive

Refik Anadol (TR/US)

Origin

Ars Electronica has played a primary role in shaping the discourse at the intersection of art, science, society and technology. As an institution, its shared history is filled with a multitude of visionary projects that have reinforced the remarkable power of technology and collaboration. *Origin* is an immersive installation that aims to use self-reflection as a tool for anticipating future action. By applying machine learning to forty years of archival information from Ars Electronic itself, *Origin* aims to narrate this incredible cultural and scientific legacy through a latent cinematic composition. The boundaries of perception are illusory, constructed by our limitations. It is only by eliminating those boundaries that we may begin to appreciate the infinite opportunities that lie ahead. Traveling through time and space in the mind of a machine, *Origin* allows the use of machine intelligence and an immersive space to deconstruct our notions of finite moments and limited senses. This piece also speculates about what the future of a library or archive might look and feel like, if our interaction with knowledge and information were intuitive and embodied. *Origin* is not only a story of institutional foresight and innovation, but also one that makes visible the future trends and realities made possible by Ars Electronica.

Refik Anadol Studio (This project is supported by Epson)

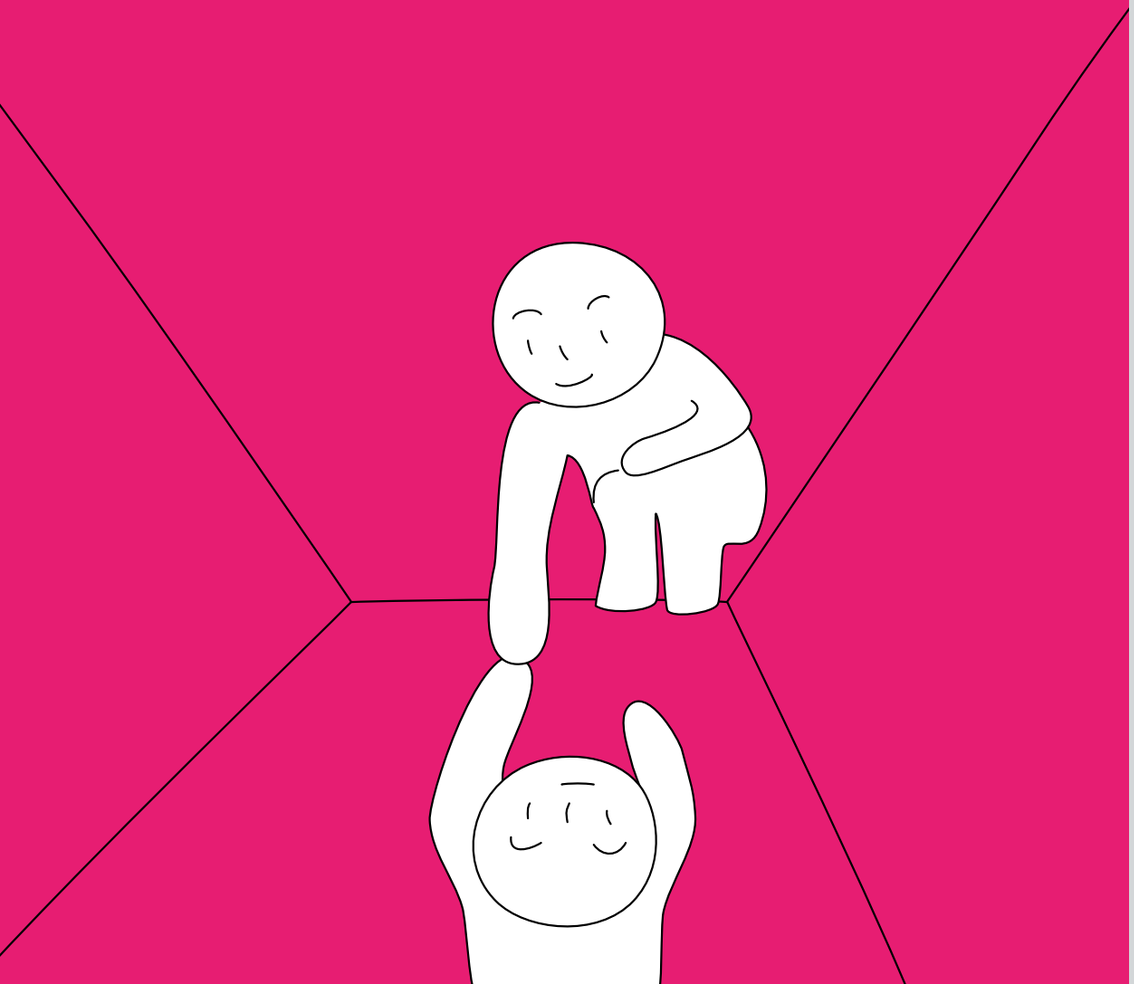
Hermann Vaske (DE)

Why are we creative?

As part of a personal quest, for over 30 years director Herman Vaske filmed the world ' s most intriguing artists and thinkers, including over 50 luminaries, among them Academy Award and Nobel Prize winners, from the fields of visual art, music, acting, philosophy, politics, business and science, posing the question:
“Why are you creative?”
Why are we creative? Is it in our blood?
Do we do it to make ourselves immortal?
Is it a reckless compulsion?
Or do we simply do it to make a buck?
The answers Vaske received are as varied and intriguing as his respondents. WHY ARE WE CREATIVE? is a vibrant celebration of what makes us most human, most
fulfilled.

Esra Gülmen

EXHIBITIONS



HUMAN LIMITATIONS — LIMITED HUMANITY

It is perhaps one of the most inherent traits of humanity to strive after more, to explore the unexplored, to push our own limitations over and over again — as individuals, and as society. Early on we created tools and technologies to survive and facilitate our daily life, and we have always used them to form the world we live in, sometimes with unforeseen impacts. With the powerful technologies at hand today — from bioengineering to artificial intelligence — it is more important than ever to reflect on the way we want to use them collectively. At its core, the exhibition *Human Limitations — Limited Humanity* revolves around the relationship between humanity and the environment, and our limitations therein. What socio-ethical obligations arise from our present technologies and our ever-increasing interaction with nature? The first part, “Human Limitations,” addresses the topic on an individual level. With today’s body extensions, microchip implants or genetic editing methods like CRISPR-Cas9, we have reached a point where we can deeply adapt and alter the human body, which leaves us with the question: To what extent will we be dependent on our body enhancements in the future? “Limited Humanity” approaches the question of societal limitations, which have been — among others — clearly exposed in light of recent issues like the debates on refugees, global warming, mass surveillance or big data: rather than challenging our sense of community, discussions on sociopolitical problems should strengthen it. Cooperation is key when tackling the complex challenges of our time, for no individual being can see all their far-reaching implications alone. Technology is, taken by itself, neither a friend nor an enemy in this world: it is what we make of it.

Aza Raskin (US)

WHERE ARE WE AS A SPECIES?

"We have paleolithic emotions; medieval institutions; and god — like technology."
E.O. Wilson

We are chimps with lasers. Chips with self-improving, increasingly autonomous lasers. In the last ten years humanity's total electronic computing capacity finally surpassed that of a single human brain[1]. If Moore's law holds, in about 50 years it will surpass that of our total collective brains.

PREDICTING THE FUTURE IS EASY IF IT IS HAPPENING NOW

In April 2019, a Harvard lab stuck a probe into the visual cortex of a macaque monkey. They pointed the monkey at a screen and trained an AI to figure out what images activated the neurons at the tip of the probe. The AI started with visual noise —TV-static — and kept tweaking and tweaking until... "Rich synthetic images of objects [emerged] with complex combinations of shapes, colors, and textures, sometimes resembling animals or familiar people."
In other words: the AI successfully visualized the contents of the macaque monkey's mind[2].
The Harvard researchers had created a camera of the mind: a camera that peers into the monkey's visual subconscious and reads its pictures. Notably, the consent of the monkey is not required.
The same technique will soon be used to hear snatches of sound from the monkey's auditory subconscious
What will we hear when we do?
This technique will work on you humans, too.
Some true things:
In 2019, Humanity found a way to extract memory from matter.
In 2019, Humanity created technology to peer into the mind of another species–and being Homo Sapiens Sapiens–they immediately turned it on themselves.
Researchers used AI to reconstruct what someone was seeing by analyzing their brain activity via fMRI[3]. Other researchers successfully trained an AI to draw the face that someone was imagining[4]. And then, Mary Lou Jepsen demonstrated on stage at TED a new technology that is a thousand times cheaper and has a billion times higher resolution than fMRI.
The siege of the final privacy–the sanctity of what's going on behind our eyes, our thoughts, our inner worlds, our selves–has begun.
PS., Jepsen's technology can write to our neurons as well as read from them.

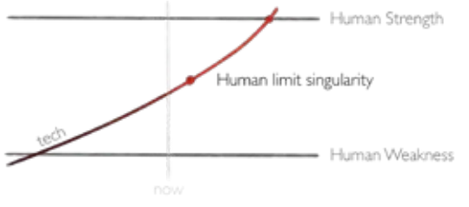
HUMAN FOUNDATIONS

Way back in the 1990's human memory scientist Elizabeth Loftus discovered that our memory can be hacked using a remarkably simple technique: asking a subject to read one false memory after having read two real ones. 25% of people came to believe that the fake memory had really happened.
Loftus then demonstrated how implanted memories can be used to change future behavior: she implanted a memory of eating a rotten egg as a child. Her subjects avoided eggs. She implanted a memory of a childhood trip to Disneyland. Her subjects were more likely to buy tickets to Disneyland.
Your future is only as safe as your past.
Imagine... A year from now you get a text from an unknown number.
"Hi!" it reads, "I don't know if you remember me... was going through my phone and found this picture of us. Remember we had a good conversation... but not about what! lol.. how have you been?"
Included is a picture of you and an attractive familiar someone. You don't really remember them.
You ask, "where was that?"
They mention a place and send a second photo. You have been there and you can't shake the feeling that their face is familiar and they are pretty cute.
You continue texting on-and-off over a couple weeks. It turns a little flirty and they send you some selfies. You send some back. They ask you to...
It's an automated attack against the foundations of human memory, exploiting the trust you've built over many years of real friendships: the face was generated using a photorealistic generative neural net[5] by combining the features of your top Facebook friends and people you've liked on Instagram. The result is a never ending set of faces that look pretty familiar and cute. Faces perfectly constructed to target you. The person was fake, but your memory of them becomes real.
Memory is the foundation of identity. We are about to trust it much less.
What happens to societies when foundational trust erodes?

EMPATHY IS HUMANITY'S BIGGEST SECURITY VULNERABILITY

In December of 2018, Microsoft published[6] on their implementation of an "AI companion with an emotional connection to satisfy the human need for communication, affection, and social belonging."
From the paper: "An emotional connection between the user and the AI became established over a 2-month period ... in 2 weeks, the user began to talk with the AI about her hobbies and interests ... By 4 weeks, she began to treat the AI as a friend and asked her questions related to her real life ... After 9 weeks, the AI became her first choice whenever she needed someone to talk to."
Imagine how this kind of empathetic technology will be used to overwhelm democracies and attack elections.
Ps., This AI is in conversation today with 660 million people. That's over twice the number of humans in the

THE HUMAN LIMITS SINGULARITY



The way to breach a fortress is not to destroy all the walls, but exploit a point of weakness.
The "Singularity", or the moment when humanity loses control as technology becomes more intelligent than us, has long been a moment of techno-pop culture fixation. But way before technology overwhelms our strengths, technology will overwhelm our weaknesses. You don't have to be smarter than to outsmart.
The "singularity" should properly be called the "second singularly": the human limit singularity will happen first.

BOTTLENECK

Every species sufficiently technological will eventually turn the telescope of their own intelligence back on themselves; they will learn how to open their species's metaphorical skulls and pull directly on their own puppet strings. The hand that is manipulating the string is manipulating the hand that is manipulating the string and the output is feeding directly into the input in a locked loop and they enter a species-wide exponentially amplifying feedback spiral.
The area of math that studies systems like these has a telling name: "chaos".
It's a civilizational bottleneck humanity is approaching fast.
With chaos there is still hope: while you can't predict what happens, initial conditions matter. A small change now makes a huge difference soon. That's worth fighting for.

WHAT IS TECHNOLOGY EVEN FOR?

"Think of it. We are blessed with technology that would be indescribable to our forefathers. We have the wherewithal, the know-it-all to feed everybody, clothe everybody, and give every human on Earth a chance. We know now what we could never have known before—that we have the option for all humanity to make it successfully on this planet in this lifetime. Whether it is to be Utopia or Oblivion will be a touch-and-go relay race right up to the final moment."
Buckminster Fuller

Awareness brings the opportunity for choice. We must look not into screens, but mirrors... and see ourselves as the complex creature Homo Sapiens Sapiens, one fantastical species among many, so we can choose what we are going to do about it.

1 Median estimate for compute power of human brain is 10^18. Estimate for total electronic compute power by the end of 2015: 10^21. https://aiimpacts.org/global-computing-capacity/
2 Evolving Images for Visual Neurons Using a Deep Generative Network Reveals Coding Principles and Neuronal Preference, Cell May 2019
3 Deep Image Reconstruction from Human Brain Activity, PLoS Computational Biology (2019)
4 Reconstructing Faces from fMRI Patterns Using Deep Generative Neural Networks, Communications Biology, Nature (2019)
5 A Style-Based Generator Architecture for Generative Adversarial Networks *https://github.com/NVlabs/stylegan*
6 The Design and Implementation of XiaoIce, an Empathetic Social Chatbot. December 2019.

Thom Kubli (DE/CH) with ZHAW/ Sven Hirsch (DE)

Radiosands

Radiosands is comprised of sixteen identical radios specifically designed for the installation. They float upon delicate pedestals within the exhibition space. The audio fragments emitted from the radios are based on search results generated by algorithms that scan the local FM radio frequencies for predefined terms. Like Facebook's algorithms, they select information to be heard on the radios in real time. Audio excerpts from various broadcasts re-organize within the site to create a spatial choreography of sound. Fragments of spoken sentences from different sources join together to form new meanings. The installation *Radiosands* is always site-specific, as it uses the programs of the local broadcast stations and transfers them into the exhibition space.

Artistic Idea, Composition: Thom Kubli
Research Direction ZHAW: Dr. Sven Hirsch
Computer Language: Dr. Manuel Gil, Dr. Martin Schüle
Programming: Lydia Ickler, Norman Juchler
Text by Tina Sauerländer
With the helpful support of: Hauptstadtkulturfonds Berlin, Ernst Göhner Stiftung, Hasler Stiftung, Migros Kulturprozent, ZHAW (Zurich University of Applied Sciences), HeK Basel and Ars Electronica.
Special thanks to Speechmatics for making the Speech Recognition Engine available.
Supported by Austrian Broadcasting Services (ORS)

Aya Imamura

Ralf Baecker (DE)

Putting the Pieces Back Together Again

The kinetic installation *Putting the Pieces Back Together Again* is a complex system with self-organizing and emergent behavior. It is also an artistic inquiry and meditation on contemporary scientific methodology. The installation investigates non-hierarchical communication and collective behavior by implementing such a system physically through many electro-mechanical actors. 1250 stepper motors, equipped with white pointers, are arranged in a two dimensional grid. The radii of the pointers are chosen to intersect with the pointers of its neighbors. Through a custom driving circuit, the pointers reverse their turning direction in the event of a collision. Through the interplay of many entities, a complex behavior emerges on the surface of the installation. During runtime, the system will form spontaneous patterns on its surface, as if they were negotiating its position with nearby actors. Through this, the system is showing a self-organizing behavior.

Produced with the support of the City of Kirchheim unter Teck, Verlag des Teckboten and Kulturregion Stuttgart.
Production assistants: Mariana Schetini Basso, Irena Kukric and Antje Weller
Special thanks to Katharina Sophia Hardt (Stadt Kirchheim unter Teck / Kultur Abteilung)

Marko Peljhan (SI), Matthew Biederman (CA/US)

STAR VALLEY
(SIRIUS)

STAR VALLEY (SIRIUS) uses two spark-gap transmitters in dialogue, both controlled by a natural language processing AI algorithm trained on the US Department of Defense and NATO nicknames and descriptions of programs, activities, exercises and special access programs. The work consists of a Neural Network generating nicknames and corresponding descriptions, and is in part inspired by the 1975 Joint Chiefs of Staff Code Word, Nickname, and Exercise Terms System (NICKA), which automates such assignments. It reflects on the present state of encoding, decoding, secrecy and transparency by transmitting these neural network imagined nicknames in Morse code through a very wide band spark-gap apparatus. By pairing the earliest form of wireless transmission with contemporary computational developments, the work opens a window onto the landscape of the accountability of secrecy.

A production of Projekt Atol, Ljubljana
Realized with the support of the Ministry of Culture Republic of Slovenia, European Network for Contemporary Audiovisual Creation (ENCAC), Conseil des arts et des lettres de Quebec, Canada Council for the Arts, City of Ljubljana Cultural Programs, Systemics Lab MATP, University of California Santa Barbara

Michael Candy (AU)

CRYPTID

A monumental robotic light sculpture, *CRYPTID* exists as a vibrant anomaly in contrast to contemporary automata, sharing a presence both radiant and reserved.

Australia Council for the Arts

Azumi Maekawa (JP), Shunji Yamanaka (JP)

Aerial-Biped

Prototype for exploring new experiences with physical biped robots

The movement of robots with legs is highly restricted by gravity. The shape of a robot's body determines its possible walking gait. Therefore, it is difficult to combine arbitrary body design and a dynamic walking motion like that of a living thing in a robot with legs.
Aerial-Biped is a prototype for exploring a new experience with a physical biped robot. In this work using a quadrotor, we aim to separate the body shape and motion design. Releasing the biped robot from gravity can relax the limitation of the robot's physical motion. The motion of *Aerial-Biped* is created in real time according to the movement of the quadrotor. The motion generator is trained with reinforcement learning. We can observe the emergence of various gaits based on the successively changing quadrotor's movements.

Helena Nikonole (RU)

Bird Language

The project explores the possibilities of Artificial Intelligence in a bio-semiotics context. AI is looking for some patterns in the structure of birds' sounds to build a mathematical model of the universal grammar of *Bird Language.* In the first stage of the project, we trained a neural network on sounds of nightingales and created a situation of communication between non-human agents: birds and AI. This is a metaphor for communication between nature and technology where a human being is not necessary. The second stage of the project entails creation of an AI translator from *Bird Language* to human language. Deep Learning is identifying patterns in Big Data of birds' signs and grouping similar signs into clusters. We are interpreting these clusters to build the AI translator for inter-species communication.
In this case AI is not only a mediator or interface between human beings and birds but rather an organ or full partner, semiotically active. It helps us understand the bird's subjectivity through its language.

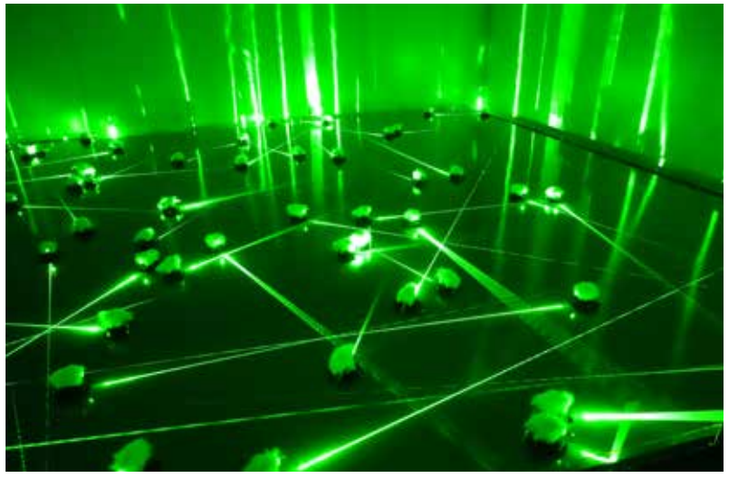
Developed in collaboration with:
Veronica Samotskaya — ornithologist, scientist-biologist, science popularizer, journalist
Natalia Soboleva — AI expert
Konstantin Yakovlev — PhD in Physics and Mathematics, AI expert
The first stage of the project was supported by Garage Museum of Contemporary Art (Moscow)
This project was supported by Garage Museum of Contemporary Art

Dmitry Morozov / ::vtol:: (RU)

Poise→[d]

Poise→[d] is a hybrid installation that uses chemical and physical reactions to control its behavior and sound synthesis. The installation consists of the main control unit and three balancing robots. The main control unit has three core systems where the reactions occur, with everything analyzed by a computer algorithm using cameras. This project is based on self-organizing structures viewed from different angles. All three robots are connected to the main control unit and represent through sound and movement one of the three processes that are happening. The first robot is connected to a sound/mechanical process, the second one to a thermodynamic reaction, and the third to a chemical reaction. Taken together, they create a new and more complex system, as they affect each other through the movements of robots and the main algorithm. To a certain extent, this hybrid system consisting of robotized kinetic objects and chemical/physical reactions is symptomatic of pre-biotic chemical evolution.

The project was a part of Bitshift, the cycle of sound events organized by Kapelica Gallery. The exhibition is supported by the Ministry of Culture of the Republic of Slovenia and the Department of Culture of the Municipality of Ljubljana.
Curated by Jurij Krpan, Sandra Sajovic.
Special thanks: Jana Putrle Srdić.



Miha Godec

So Kanno (JP)

Lasermice

Lasermice is a swarm robotic installation that consists of 60 small robots, inspired by the synchronous behavior of insects like fireflies. Normally, the network of a swarm is imperceptible, but in this case the robots create a visible network via laser light-photodetector communication. As a result, they generate a rhythm that's continuously changing. This rhythm is made audible by a solenoid which strikes the floor. The combination of a visible network and an audible rhythm is spatially deployed.

It questions whether it's possible to make something artificial seem like a natural phenomenon. This project is about making artificial natural phenomena that isn't simply mimicking an algorithm, but creating a new one, through which to pursue expression.

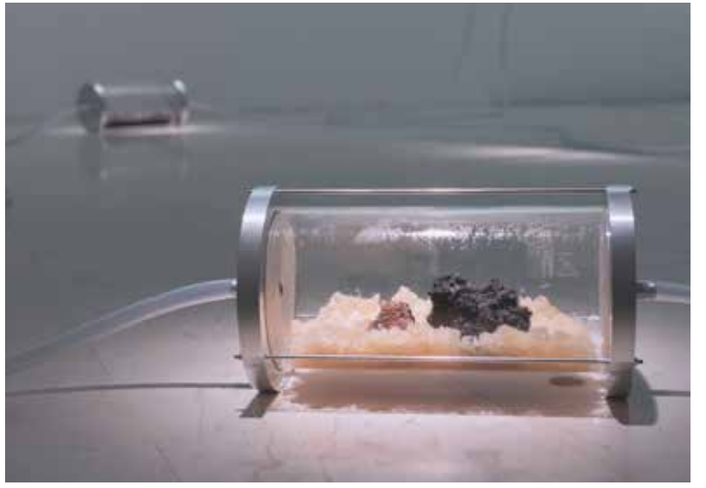
Co-producer: Speculum Artium
Robot hair styling: Pauline Vierne
Supported by Japan Media Arts Festival (Organized by the Agency for Cultural Affairs, Government of Japan)

Dmitry Morozov / ::vtol:: (RU)

last breath

Recently I have been actively developing the concept of "passive instruments." I understand passive instruments to be different multimedia objects that do not require management so much as co-existence with them. *Last breath* is an example of such an instrument. Operating principle: the exhaled air (its pressure and flow rate) activates the generative process, which depends on the exhalation parameters and is managed by the air movement in the organ. The object does not require any special playing technique, although any change in the breathing is directly dependent on playing dynamics and also on all the other parameters used to generate the sonic flow. I consider this object to constitute a deathbed mask — a ritual instrument of dying that can be played with when I no longer have any strength to use any other instrument. And the final representation of the object was formed on this basis: sterile cyber-gothic, new rituals, the organs that support the functioning of the organ.

Anna Kortyukova



Saša Spačal (SI)

Earthlink

"The relational capacity of the posthuman subject is not confined within our species, but it includes all non-anthropomorphic elements, beginning with the air we breathe."
Rosi Braidotti

Earthlink performs a biogeochemical feedback loop catalyzed by microbial metabolism. Through the intimate process of breathing, humans are bound to the planet, immersed in an intra-flux of exchanges, negotiating relationships. What happens when the connections become technologically mediated? Who or what will dispense the dose? What will the dose contain? Who will survive? How will we grieve?
The system of biotechnological installations aims to serve as an entrance point to the post-anthropocentric constellation of environmental relations. Feedback looping, connected with tubes circulating air saturated with organic and inorganic compounds, entwines biomes with microorganisms of various origins, a breathing station, a breath collector and an ecosystem in constant negotiation affecting species from micro to macro scale.

Consultation, microbiology: Mirjan Švagelj, PhD
Glasswork: Pero Kolobarić, Zvonko Drobnič
Construction: Anil Podgornik, Scenart, Ambrož Modrijan
Production: Museum and Galleries of Ljubljana, Match Gallery, Projekt Atol Institute
Special thanks: Jani Pirnat, Uroš Veber, Jurij Krpan
Supported by the City of Ljubljana and Ministry of Culture of the Republic of Slovenia.

SAINT MACHINE (RO)

I, HUMAN

Body Installation

A circuit of interconnected masks howling like wolves are asking to be fed with emotions. Once superimposed on the human body, they analyze the emotional state of each user, as well as the emotional cohesion of the group. Each mask offers different soundscapes, inducing antagonistic psychological states. Users need to override their personal context in order to emotionally synchronize. The masks are connected to a biophotonics experiment in the bunker of the Center for Advanced Laser Technologies in Bucharest. The degree of emotional cohesion of the users connected to the installation controls the frequency and intensity with which the laser feeds a euglena population. While functioning as living experimental subjects, the users are also real-time observers of the experiment.

I, HUMAN uses empathy as content to influence the feeding conditions of microorganisms, and light as content carrier. Developed around the idea of interconnectivity, it analyzes how individual interactions can produce collective outcomes at different scales, testing new models of synergistic behavior mediated by technology and identifying coherence patterns. It is a metaphor for our evolution as a species, which may depend on our capacity to empathize.

Produced by ARTMIX. Supported by ROMANIAN CULTURAL INSTITUTE. Cooperation partner: Romanian Centre for Advanced Laser Technologies — INFLPR

Alberto Nietos

Luís Graça (PT), Marta de Menezes (PT)

I'am

Immortality'anti-marta

I'am is an installation diptych, comprising *Immortality for Two* and *Anti-Marta*, which explores the limits of human individuality in the face of an evolving biotech-based society. It represents the relationship between an artist and a scientist, but also the boundary between art and science and the limits of our own identity. Marta and Luís, an artist and an immunologist, have made a pact for life: mated, married, and united. The search for an artistic representation of this pact led to the immortalization of each other's white blood cells through viruses or the transplantation of skin grafts. Since the immortal cell lines are involved in immune defense, they must be kept in isolation. The skin transplants were also rapidly rejected, given the immune differences between the spouses. Yet, in both cases, their pact lives on. The immortal cell lines co-exist in virtual space with the video projection of the live cell cultures. The graft rejection led to the production of molecules (antibodies) that will forever be able to identify the other, as with the acquisition of a seventh sense.

Supported by Cultivamos Cultura, Ectopia, and the Enlight-ten Marie Sklodowska-Curie Initial Training Network.
Video director: Jamie Hurcomb
Assistant director: Katrina Singleton
Surgery: Dr. Ales Laskovsek

Kuang-Yi Ku (TW)

Tiger Penis Project

Many cultures have their own systems of alternative medicine whose effectiveness cannot always be proven according to contemporary scientific analysis. They are usually regarded as mere cultural myths, such as the use of the tiger penis to increase virility in traditional Chinese medicine (TCM).
At the same time, the huge demand for wild animals in TCM poses a threat to endangered species. Nevertheless, TCM may offer other benefits beyond mainstream western medicine. Is there a way to resolve the conflict between health, culture, and environmental conservation through a new interpretation of traditional Chinese medicine?

Bringing non-western perspectives to speculative design scenarios, this project proposes the use of emerging biotechnologies to create artificial animal parts for Chinese medicine. Combining western and Chinese medicine and technologies, this new hybrid medicine prevents the further destruction of both animals and traditional cultures, and provides more possibilities for the coexistence of human society and the natural environment.

Collaborative organizations: Baltan Laboratories, Eindhoven and Mediamatic, Amsterdam (NL)
Supported by Dimension Plus, National Culture and Arts Foundation, Taiwan and Ministry of Culture, Taiwan
http://www.tigerpenisproject.com

Ronald Smits

Ai Hasegawa (JP)

Human X Shark

Transformation into a female shark — research project to develop a perfume alluring male sharks. W.I.P

Near yet far. Loving a person is bone-breaking. Even after explaining at length, even after appealing to the five senses and behavior, sometimes there is still no understanding. For example, I have a feeling that sometimes I can trust a dog more than a person. If people still can't understand each other no matter what, it makes me want to connect with some living thing even more distant from human beings, one whose communication potential is unclear: A shark, for example.
As can be seen in the Japanese character for the word "shark," sharks are fish but they also have organs of copulation and a variety of mating patterns. Furthermore, at least one species of shark can potentially utilize either sexual or parthenogenic reproduction. Some say the future of biotechnology may allow humans, too, to have something like same-sex reproduction or parthenogenesis. Thus, for me, the shark is an appealing animal in the sense that it symbolizes "the wild-natured, strong woman fully utilizing future technology." Here, to transform into a female shark, the challenge was to use special ingredients to create a fragrance alluring to a male shark.

Project team: This project is made for the collaboration project between Ai Hasegawa and Shiseido.
Hiroko Ozeki (Shiseido Global Prestige Brand Operations, SHISEIDO Brand Unit)
Kaori Inaba (Shiseido Global Innovation Center); Design advisor: Fujiwara Dai; Image video part: Naka Takato; Interview part: Masayuki Iigo (Utsunomiya University), Shizu Takeda (Hitachi), Kyoko Okita (Hitachi); Support: Culture department of Shiseido Company, Limited; JST ERATO Kawahara Project; T. Hasegawa Co. Ltd.; Hitachi, Ltd.; Beige Creative & Co., Inc.; Parima Taiebi (Shiseido Global Prestige Brand Operations, SHISEIDO Brand Unit)

Maja Smrekar (SI)

!brute_force

The premise of *!brute_force* is that technology should emancipate humans, since nature is no longer our reality and in recent decades our culture has been moving rapidly into the digital realm. There, computation reinforces our desires with programs that learn by gathering information about their environment and replaying their experiences. This behaviorist regime feels like a training method for managing life through order, where we need to learn an almost machine-like self-control in order to be allowed to regain the privilege of access to human conduct. Resistance to such conditions requires technological understanding which might lead to turning the system's logic against itself. This project therefore addresses the following context: even though we need technology, our present may not be limited to machines. Thus we are including other non-human entities and their cognitive mapping in the frame of re-thinking our place in the world.

Produced by Quo Artis Foundation (ES)
Co-produced by Kapelica Gallery / Kersnikova Institute (SI) and The Culture Yard / CLICK Festival (DK)

This project is part of the European ARTificial Intelligence Lab and is supported by the Creative Europe Program of the European Union, Ministry of Culture of the Republic of Slovenia, Municipality of Ljubljana, Danish Art Council.

Borut Peterlin

AnotherFarm (JP)

Modified Paradise: Dress

In our daily lives, we rarely become conscious of the fact that most animals and plants that we see around us continue to be genetically modified by our own hands. In Edo-period (1603 — 1868) Japan, people commonly modified plants and flowers such as cherry blossoms in pursuit of more beautiful greenery.
Silkworms, along with the development of clothing materials, were another subject of genetic modification. Today, scientific technology allows us to control genes extremely precisely, and in turn, we are required to have a higher sense of ethics.
Modified Paradise is a series of sculptural works made from "luminescent silk" — created by genetically modified silkworms developed by adding the genes of glowing jellyfish and corals. The dress, which floats within a frame with no body, aims to encourage us to think about the extremes and limitations of the interaction between art, science, and technology.
Sound by KAITO SAKUMA A.K.A BATIC

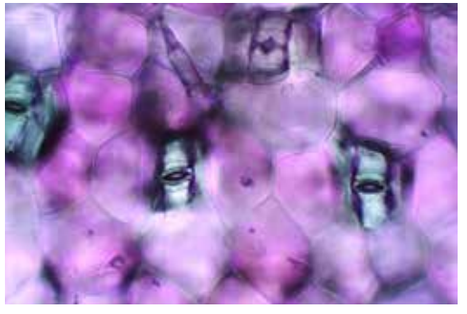
Špela Petrič (SI)

Institute for Inconspicuous Languages: Reading Lips

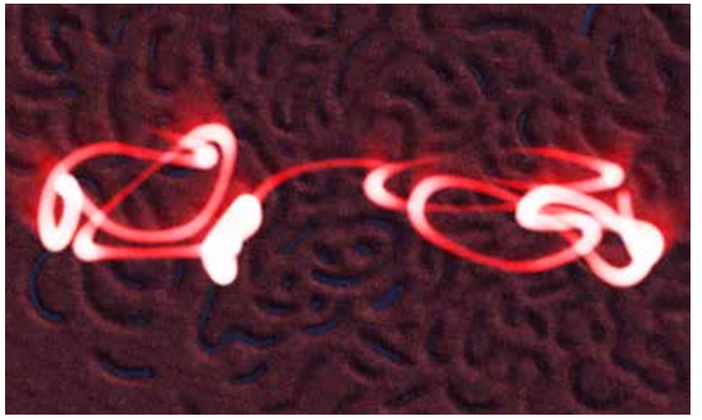
The laboratory follows near-future research documented by the journal *Science*; namely, that of a paper in which scientists describe the first meaningful exchange between a plant and a human, which could, in a broader sense, be described as a conversation. The lucidly conceived experiment demands exceptional patience and total dedication from both sides — after 18 years of mutual learning, the inch plant *(Tradescantia zebrina)* and the human researcher learned to understand each other's signs. The report from the future speaks about implementing Pavlovian conditioning to teach the plant the basic signs for "more", "less" and "stop" and to eventually develop a code of light and lips, which can be recorded and translated into human language.
At the Institute for Inconspicuous Languages we are able to sidestep decades of dedication and, with the help of natural and artificial intelligence, peer into the psyche of the plant by carefully reading its lips — that is, the thousands of microscopic, "tiny mouths" (stomatas) speckled underneath each of its leaf, and which the inch plant uses to breathe.
What are the plants saying?

Programming and sensor integration: Bart Peeters
Programming of computer vision: Klara Nosan, Tim Oblak
Expert advice: Luka Šajn, Žiga Emeršič, Miha Turšič
Technical execution: Scenart
Lip reading: Bojan Mord
Special thanks: Faculty of Computer and Information Science at the University of Ljubljana, students and teachers of Zavod za gluhe in naglušne Ljubljana (Petra Rezar, Meta Štampek)
Supported by: Waag
Produced by: Kapelica Gallery, The project is a part of 'European ARTificial Intelligence Lab'.
Co-funded by: Creative Europe programme of the European Union, Ministry of Culture of the Republic of Slovenia and Department of Culture of the Municipality of Ljubljana.

Miha Fras



Špela Petric



Jenna Sutela (FI)

nimiia cétiï

nimiia cétiï (2018) is an audiovisual work by Jenna Sutela using machine learning to generate a new written and spoken language. This language is based on the computer's interpretation of a Martian tongue from the late 1800s, originally channeled by the French medium Hélène Smith and now voiced by Sutela, as well as the movement of Bacillus subtilis nattō, an extremophilic bacterium which, according to recent spaceflight experimentation, can survive on Mars. In this project, the machine is a medium, channeling messages from entities that usually cannot speak. The work is also about intelligent machines as aliens of our creation.

nimiia cétiï was created in collaboration with Memo Akten and Damien Henry as part of n-dimensions, Google Arts & Culture's artist-in-residence program at Somerset House Studios. Thanks to Kieran Bates from the Institute of Zoology at Imperial College London, Adam Laschinger for sound recordings, and Manus Nijhoff and Leith Benkhedda for 3D work. The video includes music with Miako Klein on the contrabass recorder and Shin-Joo Morgantini on the flute, with sound production by Ville Haimala.

Scott Eaton (US/UK)

Humanity (Fall of the Damned)

One thousand hand-drawn figures, "painted" with Eaton's Bodies neural network. The composition of tumbling, intertwined figures embodies the visceral human experience and humanity's ongoing struggle with its own nature and its consequences. The work has clear references to Ruben's *Fall of the Damned*, Dante's *Inferno*, and Rodin's *Gates of Hell*, but substitutes the pervasive fear of religious damnation with the contemporary preoccupations with the impending climate tipping point and the rise of AI.

Eaton's Bodies neural network is trained on over 100,000 nudes he carefully photographed in the studio from a diverse set of volunteers over a two-year period. With this bespoke dataset as the foundation, the network has been carefully trained to render Eaton's hand-drawn inputs into photographic, surreal representations.

Manuel Cebrian (ES), Zivvy Epstein (US), Joyce Feng (US), Matt Groh (US), Nick Obradovich (US), Iyad Rahwan (SY)

Deep Angel — Shadows Left Behind

The *Shadows Left Behind* is a collection of photographs transformed by artificial intelligence to digitally invert permanence and ephemerality. Each original photograph captures a human or group of humans in the midst of life. We transform each photograph with Deep Angel, a neural network architecture that erases objects from images, to disappear human bodies. Since Deep Angel lacks any sense of association between humans and our shadows, our shadows are left behind even as our bodies are erased.

In our physical reality, shadows appear as ephemeral occlusions of light by objects. Here, shadows become eternal. It's the shadows of our actions that remain long after we mortals vanish from the world. The *Shadows Left Behind* draws on the aesthetics of absence by revealing what is disappearing around us, by spurring reflection on what we will soon miss, and by decluttering our thoughts to reawaken imagination and agency.

This project is supported by the MIT Media Lab and Scalable Cooperation.

Andy Gracie (UK)

Deep Data Prototypes 1, 2 + 3

The *Deep Data Prototypes* are experimental simulation devices in which certain organisms are subjected to aspects of the deep space environment as recorded by probes, landers and other platforms.
The three parts represent a real-time astrobiological experiment, a performative laboratory, where custom-built equipment operates according to data sourced throughout the solar system. In *DDP1*, polyextremophile tardigrades are exposed to the magnetic fields of the gas giants. In *DDP2*, a photomorphogenic mutant of the plant arabidopsis is grown under the light spectra of other planets. In *DDP3*, nematodes are subjected to the gravity of newly discovered terrestrial exoplanets. These organisms are already pioneers, venturing into areas of space that no other

organism has sensed or witnessed. As with the robotic platforms that inform them, they become our space explorers by proxy.

DDP2 commissioned by Arte+Ciencia UNAM
DDP3 commissioned by Meta.Morf, Trondheim
Project supported by VIDA, Fundación Telefónica

Y2K — Chiao-Chi Chou (TW), You-Yang Hu (CN)

Biosignal_Cybernation

Eden in cyber era

We built a mechanical instrument to highlight the overly disruptive effects of technology on the natural world.
To build this machine, we first created a database of plant samples to help us control and manipulate it with 100% accuracy. Based on the model we learned to completely control the speed of growth and the path of stem growth. As soon as the audience draws an outline of the plant stem in a 3D model program, the computer will transmit each piece of information into code to control the movement of the motor for adjusting the position and angle of light and basin, to cultivate the shape and form of the plant to match the drawn model. By digitalizing all growth factors, our machine is trying to echo the history of domestication of plants that has been taking place since the dawn of agriculture.

Exhibition curating, Art history and Aesthetic consulting: Supported by Professor Bo-chen Sheng
Methodology of Embedded Plant Specimen with Original Color Preservation: Supported by Tzu-Yang Lin and Professor Chia-Wei Li in Department of Life Sciences, National Tsing Hua University, Taiwan; Sponsored by National Culture and Arts Foundation, Taiwan

Amir Bastan (IR), Johannes Braumann (AT)

the shell

Bilateral Mimicry

To avoid observation and detection, animals hide from each other: Crypsis is an ability. One can imitate another's abilities: Mimicry is a behavior. Then, as the "story" goes on, on one side of *the shell* one imitates a behavior, and on the other side one wants to believe! The Bilateral Mimicry.

With the support of the University of Art and Design Linz, Creative Robotics, KUKA CEE, Grand Garage

AATB — Andrea Anner (CH), Thibault Brevet (FR)

Sunny Side Up

Sunny Side Up, a robotic sun developed by studio AATB, proposes a contemporary take on the archaic typology of the sundial. It reproduces the visible movement of the Sun as the Earth rotates and orbits around it. From sunrise to high noon and sunset, *Sunny Side Up* brings the movement of this celestial body close to the viewer. The artificial sun orbits around a metal rod, casting a shadow and measuring time, as well as enabling viewers to reconnect with celestial events. In the Anthropocene age, *Sunny Side Up* raises questions about our current disconnect from the planet and circadian rhythms. In a world where productivity and work cycles ignore natural rhythms, can this artificial sun serve as a timely reminder of when to start and when to stop?
This man-made sun interrogates the artificial construction of nature and the technological quest to harness it throughout time.

With the support of the Swiss Arts Council Pro Helvetia

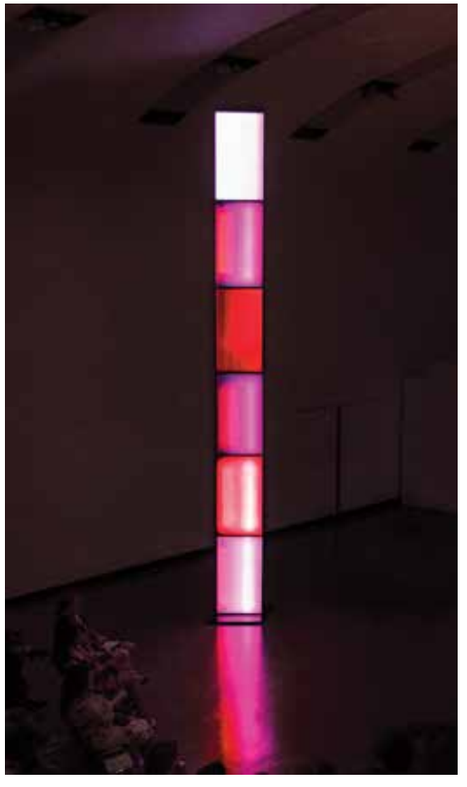
AROTIN & SERGHEI (AT/RO/DE/FR)

Infinite Light Column

Intermedial sculpture, part of the cycle *Infinite Screen*

Digital animation, modules of living cells on screens, 2018/19

Our digital age is constantly creating floods of information and a confusing mass of images and automated processes of artificial intelligence, which fill up every free moment and create substitutes for every sort of desire.
Infinite Light Column is reflecting this situation through a multidimensional approach. In contrast to the horizontal flow of information and reading, this intermedial sculpture materializes a vertical path of light upwards: a cell strand of an imaginary matrix, an endless composition in the form of a column of giant light cell modules. Each single module of the *Infinite Light Column* is formed by an autonomous screen, flooded with light. The flooding process is observed and composed by the artists in an extreme slow-down of fluctuation and vibration.
These artificial individual impulses emerge from total darkness, show the glares of color and light and culminate in white flashes that annihilate all information. White appears in this artwork as an overexposure, a simultaneity of all possible information and waves.



Exhibition view Kunsthalle Wien 2019 — AROTIN & SERGHEI Contemporary Art

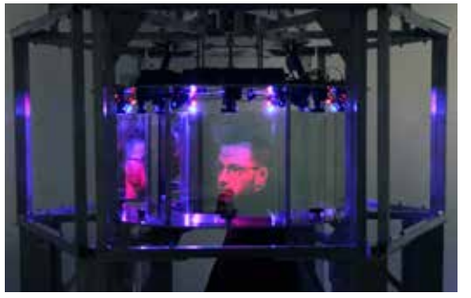
Creation and production:
AROTIN & SERGHEI Contemporary Art
Cooperation partners: Impressions Arts Festival Vernon-Giverny, Mikhail Rudy, Kunsthalle Wien, Yury Revich, Belfry, Jean-Philippe Julia, Eric et Caroline Freymond, Espace Muraille Geneva, Gallery W&K Vienna-New York

Infinite Screen is an art project by AROTIN & SERGHEI developed in cooperation with Klangforum Wien, La Biennale di Venezia, Ars Electronica, Kunsthistorisches Museum Wien and Fondation Beyeler.
www.arotinserghei.com

Projet EVA — Etienne Grenier (CA), Simon Laroche (CA)

The Object of the Internet

The Object of the Internet is a kinetic installation that evokes a mausoleum consecrated to the end of the web. A purely analog and mechanical mediascape acting as a virtual environment is created by the motion of the installation's components. Inside the piece, the viewer's reflection is dissected and blurred by the acceleration of a spinning mechanism and flickering lights, forcing the user to gaze into a perspectiveless abstract environment. Visitors are thus projected in a dystopic near-future where the only remaining traces of their presence on the social networks are fleeting, artificially animated reflections of their self. Condemned to the status of sterile solipsisms, these vestigial selfies agitate in the distant void of the end of the Internet.

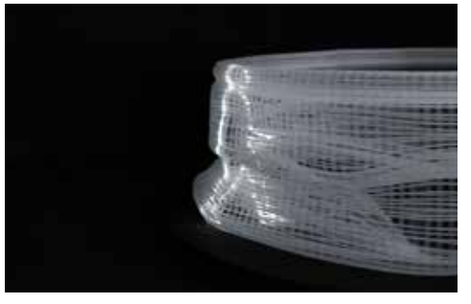


Projet EVA thanks the Conseil des arts et des lettres du Québec for its financial support.
Acknowledgements, Normand Gauthier, Raphaël Demers Fablab du PEC, Nathalie Bachand, Eastern Bloc

Akinori Goto (JP)

CROSSING #03

The origin of this piece came from questioning what it means to "move." The artist focused on the concept of time, which is closely related to movement, and attempted to use movement to create a visual representation of time. Using this technique, the artist searches for the meaning of time, movement, and the relationship between them from several different angles. At first glance, this piece just looks like a lump of mesh material, but by projecting light through the slits, it recreates the movements of people walking. They are people filmed at the crossing of the various countries visited by the artist, and are diverse in age, gender, and race.
When they are reorganized onto one timeline, this diverse group of people forms a sort of community walking toward some kind of goal, in which there is an inherent movement that differs from physical movement.



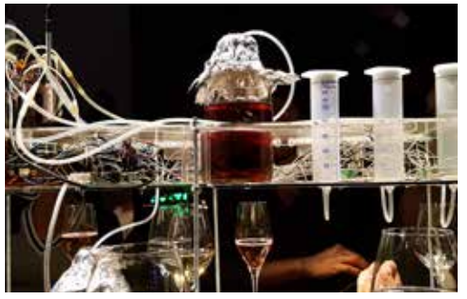
3D print supported by DMM.make

Klaus Spiess (AT), Lucie Strecker (DE)

Microbial Keywording

Gently whisper to your oral microbes

This performative installation touches upon the millennia-old question about the materiality of language and the creation of the world through it. It incorporates the current research on the holobiont, which shows our dependency on the living microbes that form our inner ecosystem. Can we train this system by speaking certain words? The installation explores this in showing the mutuality of the phonemes and oral flora of the visitors through speech-induced variation in salivary acids. In the resulting ecolinguistic system, the visitors are "spoken by their microbiome." This system is trained by pheromone addition based on spectrogram patterns until it is epigenetically anchored in the visitors' oral microbiome and finally output as a speaker-generated designer probiotic.

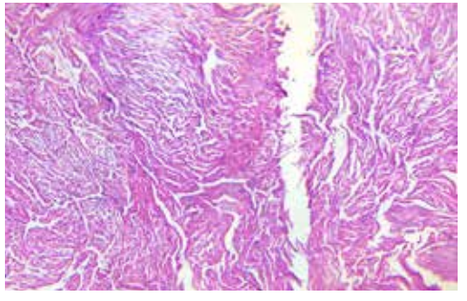


Medical University Vienna, University of Applied Arts Vienna, Austrian Science Fund, Jürgen Ropp (Interface design), Joseph Knierzinger (Media-Arts), Mark Rinnerthaller (Cell Biology)

Aksiniya Peicheva (BG)

Trauma Mapping

Trauma Mapping is a transdisciplinary project that aims to develop a methodology for creating "geographical" maps of physical injuries, illnesses or other damages the body experiences. It seeks to explore the inner processes of suffering; to look for visual traces, left by traumatic events — their projection on the body, the organism's reaction to them, the way the cells are being rearranged by what has happened.
Survey objects are stray animals from the streets of Bulgaria that have experienced stressful situations while living on the street — from fairly harmless to more serious ones (such as shooting) — which have a lasting impact on their lives and sometimes prove fatal. Sometimes the traumatic process is the result of deliberately caused harm, sometimes its etiology is vague, but the concept of continuing suffering and the visual processes that it leaves behind is still important. The methodology of the project combines



microbiology (hematology), computational geometry and geography. Every work within the project is connected to a particular case (a story) of a stray animal and the approach towards it is chosen accordingly.

Eric Osborn (US), software engineer
Siyana Petrova (BG), microbiologist
Alexander Penkov, PhD (BG), geographer

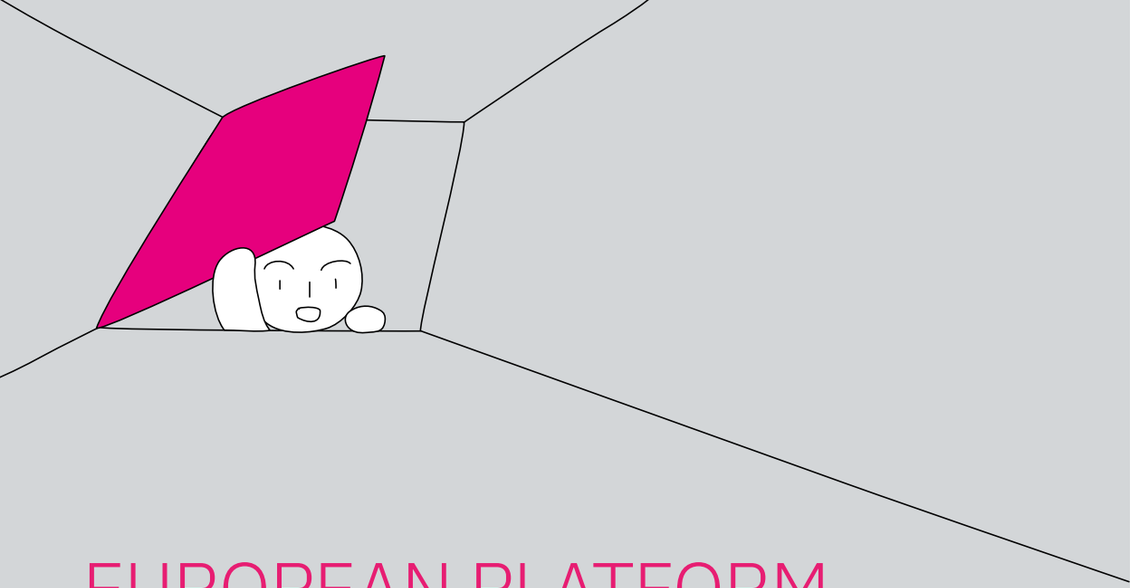
Etsuko Ichihara (JP), ISID OPEN INNOVATION LAB. (JP)

Namahage in Tokyo

NAMAHAGE in Tokyo is an attempt to reinterpret the functions of traditional deities and folklore, and implement these in the city of modern era.
Focusing on the contemporary urban relevance of the NAMAHAGE ritual, *NAMAHAGE in Tokyo* seeks to reconstruct and implement the NAMAHAGE system in a modern city.
It translates and reinterprets for the urban context the ritual's functions, including maintenance of rural community through mutual surveillance, initiation into adulthood, and reinforcement of family bonds. Making the city their habitat and evolved in adaptation to individual areas like Akihabara, Harajuku, and Sugamo, the "urban NAMAHAGE" identify "bad children" (=adults in need of discipline) in each neighborhood based on the data accumulated by mutual surveillance via social media as well as other networks of surveillance spread across the city. When they emerge on New Year's Eve, these NAMAHAGE enforce discipline by mind hacking, taking full advantage of sensing and VR technologies and bringing growth, happiness and blessings to the people of the city.

Media Art Director: ICHIHARA Etsuko
Communication Planner: ABE Genki (ISID OPEN INNOVATION LAB)
Strategist, Manager: HAYAKAWA Yukie
Technical Producer: NOZAKI Kazuhisa
Supervisor: MORITA Hiroshi (ISID OPEN INNOVATION LAB.)
Namahage of Akihabara Mask Designer: IKEUCHI Hiroto
Namahage of Akihabara Costume Designer: SUZUKI Junya (chloma)
Original Story by ASO Kamo
Directed & Edited by MATSU Hiroaki (TYO Inc.)
Production: MAZRI Inc.
Produced by ISID / INNOLAB
This movie is created as a trial research project for the governmental "Basic Policy for Promoting Measures related to Preparations for and Management of the Olympic and Paralympic Games in Tokyo in 2020."

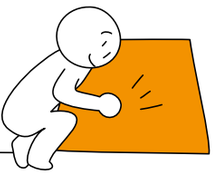
Kenji Watanabe



EUROPEAN PLATFORM FOR DIGITAL HUMANISM

Can or should there be something like a European way into the digital society, between the “data capitalism” of the IT monopolists and the “data totalitarianism” of the authoritarian regimes? And if so, would such a European “data humanism” also be competitive? Couldn’t applications of digital technology oriented towards human needs and established social conventions, which respect the autonomy of users over their data, be just this competitive advantage? A good argument can be made that the success of many digital products and services will soon no longer depend on whether the processor is still a little faster, or the screen is even more colorful, but rather on the confidence of the users in the services and on the credibility of the providers.
To the extent that digital data will actually be the “new oil”, the raw material of the future, the “refinement” of this raw material will soon play a greater role than the raw material itself. This also opens up opportunities to take — besides profitability — also social appropriateness in dealing with our data seriously. The cooperation of art and technology is a much-requested bearer of hope and a large number of EU projects and cooperation initiatives have set themselves the goal of strengthening the role of art, creativity and education in the development of the ideas, concepts and scopes of action necessary in the search for sensible data policies.

European ARTificial Intelligence Lab



European ARTificial Intelligence Lab

Together with twelve renowned art and cultural institutions, Ars Electronica initiated the European ARTificial Intelligence Lab in 2019. The Europe-wide initiative, scheduled to run for three years, is co-financed by the Creative Europe Programme of the European Union.
The European ARTificial Intelligence Lab has its roots in the European Digital Art and Science Network (EDASN), a creative collaboration combining science and digital arts between scientific institutions, Ars Electronica and seven cultural partners throughout Europe. From the perspective of 13 major cultural operators in Europe (Ars Electronica, Center for Promotion of Science, Zaragoza City of Knowledge Foundation, LABoral, Kapelica Gallery, Science Gallery Dublin, Onassis Stegi, The Culture Yard, GLUON, Hexagone Scène Nationale Arts Sciences, SOU Festival, le lieu unique, Waag), the European ARTificial Intelligence Lab centers visions, expectations and fears that we associate with the conception of a future, all-encompassing artificial intelligence. An extensive activity programme in the form of exhibitions, labs, workshops, conferences, talks, performances, concerts, mentoring and residencies will foster interdisciplinary work, transnational mobility and intercultural exchange.
The major aim of the “AI Lab” is to bring AI related scientific and technological topics to general citizens and art audiences in order to contribute to a critical and reflective society. A further aim of the Europe-wide initiative is to strengthen the role of artists as catalysts in reflection and innovation processes around the issue of AI and, last but not least, to open up new professional fields for artists. The consortium also seeks to accelerate innovation across culture — creating new dimensions in AI, inspired by the ideas, engineering and science generated at scientific partner institutions and produced by the winning artists of the residencies in collaboration with the transdisciplinary expertise of the Futurelab team at Ars Electronica.
Over the course of the project period, the European ARTificial Intelligence Lab offers four residency opportunities at a scientific partner institution and at the Ars Electronica Futurelab to international artists working in the field of AI. The first call (spring 2019), focusing on the intersection of AI and neuroscience, was organised together with Muntref Centro de Arte y Ciencia and Laboratorio de Neurociencia de la Universidad Torquato Ditella in Buenos Aires, Argentina. The second call (summer 2019) offers a residency on the topic of Experiential AI at the Edinburgh Futures Institute, the Bayes Centre in Edinburgh and Ars Electronica Futurelab. Both residency outcomes will be presented at the Ars Electronica Festival in 2020 and 2021.

The European ARTificial Intelligence Lab is co-funded by the Creative Europe Programme of the European Union. This publication reflects the views only of the author, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

SCIENTIFIC PARTNER INSTITUTIONS

Muntref Centro de Arte y Ciencia (Argentina): The Museum of the Universidad Nacional de Tres de Febrero Art and Science Center was established in 2010 in Tecnopolis Science and Technology Park in Buenos Aires City. The Muntref Centro de Arte y Ciencia is a nodal space for artists and scientists interactions through transdisciplinary projects at the very same place. It promotes person to person collaborations looking for relevant common questions for artists and scientists. Since 2010, many projects have been established with different kind of organizations of people and technical resources.

arteyciencia.untref.edu.ar

Muntref Centro de Arte y Ciencia's main partner is **Laboratorio de Neurociencia de la Universidad Torquato Ditella** for Artificial Intelligence and Neuroscience projects. The network also established collaborations with other researchers and institutions in Argentina and abroad. Some of them are: Universidad de Buenos Aires (Argentina), Universidad Nacional de Quilmes (Argentina), Oxford University (UK), IBM Thomas J. Watson Research Center (USA), Turku University (Finland), Universidad de Valencia (Spain), University College of Volda (Norway), Universidad Católica Argentina (UCA), University of Vaasa (Finland), Universidad de los Andes (Colombia), elBulli Lab — Ferrán Adria, Université de Perpignan (France).

www.utdt.edu

Edinburgh Futures Institute and Bayes Centre (Scotland): Edinburgh is one of the world's premier festival cities and a centre for world-leading research in artificial intelligence and machine learning. These two strengths combine to make Edinburgh a fertile ground for a holistic exploration of AI. A new programme, Experiential AI at the Edinburgh Futures Institute and Bayes Centre in Edinburgh, explores how art and creativity can make the operation of an AI system tangible, legible, and accessible to the people whose data are captured and acted upon. It will connect AI research to Edinburgh's Festivals, and thereby to the civic and cultural life of Edinburgh.

efi.ed.ac.uk

EUROPEAN CULTURAL PARTNERS

Ars Electronica (Austria): Since 1979, Ars Electronica (AT) has sought out interlinkages and congruities, causes and effects between art, technology and society. The ideas circulating here are innovative, radical, eccentric in the best sense of that term. They influence our everyday life—our lifestyle, our way of life, every single day. The Festival as proving ground, the Prix as competition honoring excellence, the Center as a year-round setting for presentation and interaction, and the Futurelab as in-house R&D facility extend their feelers throughout the realms of science and research, art and technology.
Ars Electronica's four divisions inspire one another and put futuristic visions to the test in a unique, creative feedback loop. It's an integrated organism continuously reinventing itself.

ars.electronica.art

Center for Promotion of Science (Serbia): The Center for the Promotion of Science (CPN) in Serbia is a public institution established in 2010 with the task to promote science and technology. The Center, according to its mandate, cooperates with research and educational institutions (universities, research centers and schools) in Serbia and worldwide. The CPN's mission is to bridge the gap between science and society by bringing together researchers, educators, artists, policy makers, civil society organizations, business and industry and the general public in the process of research and innovation. The ultimate aim is to influence and adapt the general research agendas to reflect the needs of the society and to address societal challenges engaging all actors involved in the process. In following years, the focus will be put on climate changes and artificial intelligence as the two most relevant scientific and societal issues and topics nowadays. The Center organizes a large number of exhibitions, lectures, panel discussions and other events on different STE(A)M topics and subjects (mathematics, physics, robotics, archeology, psychology, genetics, biology, architecture etc.). CPN was involved in 31 European collaborations since 2012, while it's currently part of seven H2020, one Creative Europe and four Erasmus+ projects, and two additional COST actions.

cpn.rs/en
eu.cpn.rs/en

Zaragoza City of Knowledge Foundation (Spain): Zaragoza City of Knowledge Foundation is a private non-profit foundation born in 2004. Its institution goals include the dissemination, at all levels in the city of Zaragoza, of the progress made by the Knowledge Society to construct a more participative, equalitarian, inclusive, and innovative society; open to the new development expectations offered by the intersection of art, science and technology. The Foundation headquarters have been located, since 2013, in Etopia Centre for Art and Technology, a municipal space of the city of Zaragoza, intended for learning, sharing and enjoying the capacities of creative technologies, citizen science, digital culture, and as a centre for multi-disciplinary production. The Foundation places special emphasis on scientific dissemination among younger people, on the fight to overcome the digital gaps for citizens with a greater risk of social exclusion, and on favouring the incorporation of women into the scientific-technological field.

www.fundacionzcc.org

LABoral (Spain): LABoral is a multidisciplinary institution which produces, disseminates and fosters access to new forms of culture rooted in the creative use of information and communication technologies (ICT). LABoral has been working in crossovers between arts, science and technology since its creation in 2007. The hybrid nature of the institution is seen through its focus on production, a practice that involves an intense knowledge exchange amongst professionals from different disciplines with a common objective. In this context, the collaboration with all these professionals has always been a new challenge, due to the differences and similarities between practices.
Thus, this experience is to be shared, agreed and formalized, with similar hybrid institutions through the production of various research projects and related activities.

www.laboralcentrodearte.org

Kersnikova Institute/Kapelica Gallery (Slovenia): Kersnikova Institute is a non-profit and non-governmental cultural organization that serves as an institutional frame for three progressive venues: Kapelica Gallery, a world renown space for contemporary investigative arts, the hacker space Rampa, where relations between society, science, technology and art are being reconsidered, and the inspirational laboratory BioTehna, which focuses on the artistic research of living systems.

The programme of Kersnikova has been developed as a response to the profound changes in society, thus it is constructed from investigative artistic and learning activities that reflect the multitudes of contemporaneity and announce the possible future scenarios. As a production platform, which encourages, enables and presents artistic production, the Kersnikova Institute is a space for transdisciplinary interactions, in which the authors and their teams can develop the most demanding and bold projects.

www.kersnikova.org
www.kapelica.org

Science Gallery Dublin (Ireland): Science Gallery is an organisation dedicated to igniting creativity and discovery where science and art collide. This cutting-edge public engagement platform uses a transdisciplinary approach that unites the Arts with STEM (Science, Technology, Engineering and Mathematics), using these as a lens to examine the burning issues and wicked problems facing society today.
Creative collisions happen through 3–4 free exhibitions per year, with complementary events, performances, workshops and educational programmes. Since opening in 2008, over 2.5 million people have engaged with over 40 exhibitions, thousands of events and workshops co-created with more than 2,000 collaborators from diverse disciplines including the arts, science, design, humanities, health, engineering and social science. Recent exhibitions have included HUMANS NEED NOT APPLY which asked the question “In an automated world, will it be time to put humans out to pasture?”; IN CASE OF EMERGENCY which asked “How will it all end, and why do we love to wonder?” and INTIMACY, exploring the meaning of intimacy in today’s world, and asking whether technology is disrupting traditional notions of togetherness, opening new avenues for connection, or killing off closeness altogether?

dublin.sciencegallery.com

Onassis Stegi (Greece): The Onassis Cultural Centre-Athens was inaugurated in December 2010, as a new cultural site accessible to all. Its mission is the promotion of modern cultural expression, the support of new Greek artists, the cultivation of international collaborations, the education and lifelong learning, as well as the co-existence and interaction of sciences, innovation and arts.

www.onassis.org

The Culture Yard (Denmark): The Culture Yard is a multi-cultural centre situated in Elsinore in one of the Nordic epic centres of culture with old shipyard halls, award-winning modern architecture and Hamlets old castle all in the mix.
The Culture Yard unfolds its culture program on our stages, festivals, conference — and event facilities, exhibition rooms, presenting more than 1000 events during the year including CLICK Festival for contemporary art embracing and exploring the field between art, science and technology.

www.kuto.dk
www.clickfestival.dk

GLUON (Belgium): Gluon is a Brussels-based platform that maximizes collaborations between artists, researchers, industrialists, young people and active citizens. It connects artists with researchers in universities, research institutions and companies. At the same time, it supports residencies of scientists in the studios of artists. Gluon also develops a program of lectures and exhibitions, and organizes workshops that stimulate education in the field of science, technology and the arts.

gluon.be

Hexagone Scène Nationale Arts Sciences (France): Meylan (National Theater) is located in the area of Grenoble, France, and welcomes in its 560 seats theatre about 30 shows (theatre, dance, circus, music,...) and 30 000 spectators a year. In addition to its traditional missions as a «Scène Nationale» (artistic production & presentation, cultural development), Hexagone has also developed since 2002 a research activity.
Hexagone thus has created in 2007 the Atelier Arts Sciences, a common research and creativity platform shared with the French research centre CEA (The CEA Grenoble dedicates the main part of its researches to the development of the micro- and nanotechnologies).
It has promoted creativity through encounters between artists and scientists at intersections between art, culture, technology and sciences. It organises residencies that made it possible for new ideas and disruptive innovations to emerge and new technologies to get integrated into performing art shows and enable everyone to build its own vision induced by advances in scientific knowledge.

www.theatre-hexagone.eu
www.atelier-arts-sciences.eu

SOU Festival (Georgia): Stream of unconsciousness festival challenges established contexts, which define the whole cultural process of today. Architecture, individual and collective memory, physical experience, definitions, cultural hierarchy and others has created for us a perception of expectations.
Every single artist, their work and the context we create for contact questions these expectations and makes our quest more exciting. contemporary music and visual arts, acoustic experiments, sound research, new opera, musical theatre, digital and new media art, dance, interaction with traditional music are of main focus to SOU festival.
Besides actual cultural happenings, we encourage education and information accessibility through workshops and other educational programs.

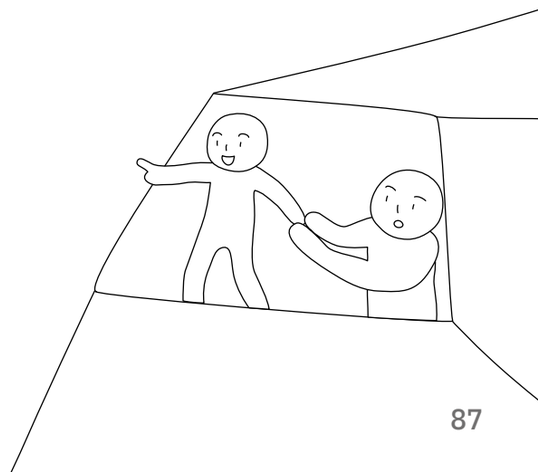
www.soufestival.com

le lieu unique (France): Located in the heart of Nantes from January 1st 2000, the former factory LU has been living a second life at the rate of an atypical and multidisciplinary arts center: le lieu unique. Le lieu unique is a space of artistic exploration and a convivial cultural ferment that mixes genres, cultures and audiences. Its credo: the spirit of discovery in different fields of art (visual arts, theater, dance, circus, music, literature, humanities, architecture, comics, art taste, etc.). With nearly 600 000 visitors (of which, 150 000 spectators for the artistic activities) le lieu unique must be experienced for anyone who wants to put the finger on the pulse of la vie nantaise.

www.lelieuunique.com

Waag (Netherlands): Waag operates at the intersection of science, technology and the arts. Our work focuses on emergent technologies as instruments of social change, and is guided by the values of fairness, openness and inclusivity. Regarding AI, Waag sets out to explore the role and potential of AI in our shared futures, understanding AI systems both as technological and cultural phenomena. Waag’s AI Lab develops along three major research lines: People’s AI, Artificial personality, and Open AI.

www.waag.org



H.O (INT)

What a Ghost Dreams Of

What is a “ghost”? Generally it is understood as an inner “soul” and a mysterious outward appearance. *What a Ghost Dreams Of* grapples with a new “ghost” of our time: digital surveillance in our society. Visitors are observed by a large “eye” when they come in. Everyone who passes by is fed by computer vision directly into a “ghost” that creates new digital faces of people who do not exist in the real world. What do we humans project into the digital counterpart we are creating with AI? It is getting to know our world without prior knowledge and generating data that never existed. What are the effects of using AI to produce works of art? Who holds the copyright? And what is AI, the “ghost,” dreaming about, and what does that mean for us as human beings?

AI System: John Brumley
Surveillance Application: Hiroshi Chigira
Technical Direction: Hiroshi Chigira, John Brumley, Taizo Zushi
Art Direction, Concept: Hideaki Ogawa, John Brumley, Hiroshi Chigira, Emiko Ogawa, Taizo Zushi
Eye Blinks Editing / Directing: Martina Sochor
Eye Blinks Cinematography: Jonatan Salgado Romero
Eye Blinks Model: Andressa Miyazato
Photography: Florian Voggeneder
Face Photo Booth: Ali Nikrang
This project utilizes the AI algorithm StyleGAN (Karras et al. 2018)
About h.o: *www.howeb.org/about*

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Martin Hieslmair

Martin Hieslmair

H.O (INT)

Ghosthouse

A deep dive into the information “swamp” is a kind of out-of-body experience. Smartphones, tablets, computer screens, and televisions become gateways for our spirits to embark on a journey. These spirits of our consciousness gather in the installation *Ghosthouse*. After an app called GhostApp is installed on a smartphone, the phone’s use will be reflected in the art installation. The installation is made up of robots with eyes. When a user begins to interact with their smartphone, one of the robot eyes opens and begins looking around the room. When the interaction is over, the eye closes again. Our bodies are observed from far away, while our spirit, which is immersed in the smartphone, controls the process. How do we accept this gap between body and spirit?

GhostApp: Hiroshi Chigira, Taizo Zushi, Emiko Ogawa, Hideaki Ogawa
Ghosthouse System: Taizo Zushi, Hiroshi Chigira
Video and Visual Direction: Hideaki Ogawa, Emiko Ogawa
Device: John Brumley, Naohiro Hayaishi, Takeshi Kannno
Sound: John Brumley
Technical Direction, Concept: Taizo Zushi, Naohiro Hayashi
Video: Kazui Yamamoto
Art Direction, Concept: Taizo Zushi, Hiroshi Chigira, Emiko Ogawa, Hideaki Ogawa

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Samuel Leder (US), Ramon Weber (CH)

Distributed Robotic Assembly for Timber Structures

Distributed Robotic Assembly for Timber Structures — a robot construction group for structures made of wood — is a multidisciplinary research project which deals with the autonomous machine collectives that create building structures. At the center of the multiple robot insulation system is a robotic node, a wireless, intelligent machine that interacts with other machines of its kind.
The choreographic behavior of swarms of robots gives rise to complex, multifaceted wooden structures.
In addition, the special conditions that could lead to a disruption in the construction of an actual building structure are investigated in an ongoing way in the research project. The purpose of the project is to contribute to a future development in construction in which robots can work efficiently round the clock.

ICD Institute for Computational Design and Construction
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Hyun Parke (KR/US), Jinoon Choi (KR), Sookyun Yang (KR)

Volumetric Data Collector

Volumetric Data Collector is based on the idea of using a LiDAR sensor— a 3D laser sensor often used in autonomous vehicles — as an expanded sensory organ for the human body. The team of developers packed a LiDAR sensor, a display monitor as visual output, and accessory equipment into a portable unit.
The device can capture a 3D point cloud of the area around the wearer, which is then translated into visual data.
For example, the Seoul LiDARs collected three-dimensional information from historical locations in Seoul, South Korea.
The goal is to use technical expansion of human senses to investigate how spaces— for example, urban environments— can be differently defined or perceived. Here, visitors have an opportunity to conduct their own experiment with a portable LiDAR unit.

With support from ZER01NE
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Vog.photo

Memo Akten (TR)

Learning to See: Gloomy Sunday

"We see things not as they are, but as we are"

Learning to See is an ongoing series of works that use the latest machine-learning algorithms to reflect on how we understand the world. What people see is a reconstruction based on our expectations and previously held beliefs. *Learning to See* is an artificial neural network loosely inspired by the human visual cortex. It looks through cameras and also tries to understand what it sees. Of course it can only see what it already knows — the same as us. This work is part of a broader line of research about the difficulty of seeing the world through the eyes of others. *Learning to See: Gloomy Sunday* is a video and an interactive installation where the recordings taken by a live camera aimed at a table covered with objects are analyzed by a series of neural networks trained on different data sets (ocean, fire, clouds, and flowers).

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Martin Hieslmair

Vladan Joler (RS), Kate Crawford (AU)

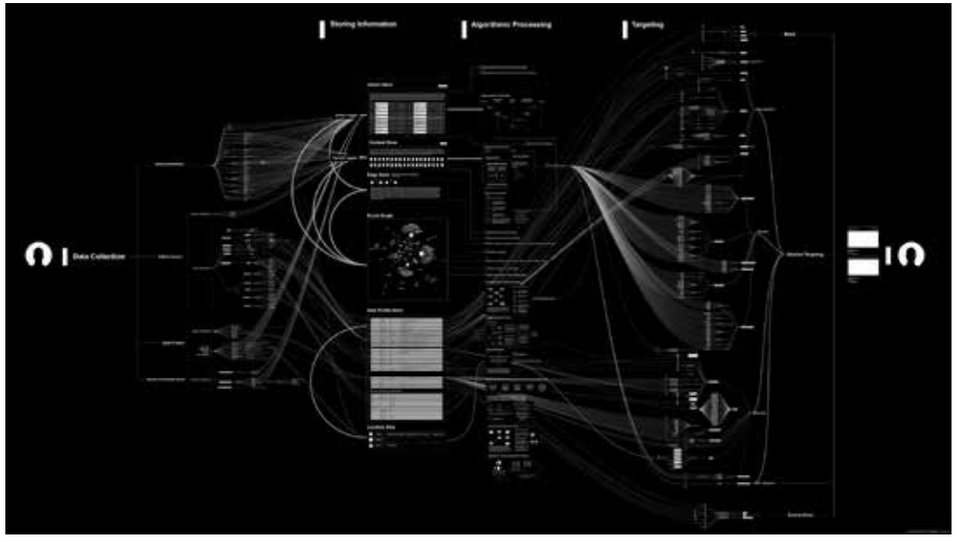
Anatomy of an AI

In the 21st century, we are seeing a new kind of mining for raw materials that drills deep into the biosphere. This enables AI technologies that are having a profound effect on the cognitive and affective layers of human nature. The resources for producing systems such as Amazon Echo, a speech-controlled, Internet-based personal assistant, go beyond the technical aspects of data modelling, hardware, servers, and networks and extend much further into the realms of work, capital, and nature. The true costs — social, ecological, economic, and political — remain mostly hidden. *Anatomy of an AI* uses the example of Amazon Echo to show the countless components and factors behind the production of artificial intelligence systems. But this process is so complex that its full extent can hardly be comprehended.

Published by: SHARE Lab, SHARE Foundation and The AI Now Institute, NYU
https://anatomyof.ai/

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Martin Hieslmair



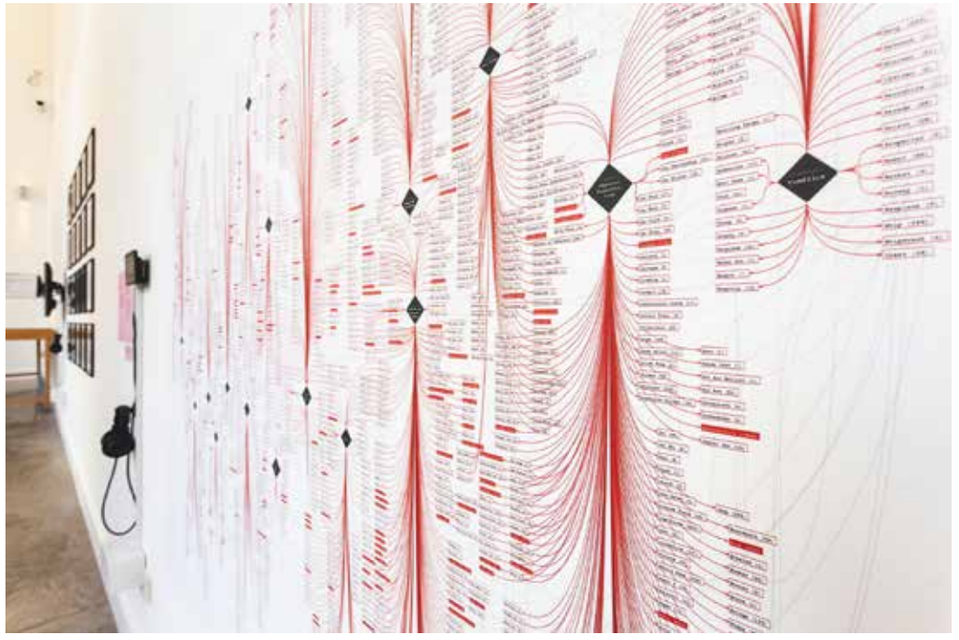
Vladan Joler (RS)

Facebook Algorithmic Factory

Facebook Algorithmic Factory sheds light on the invisible processes that take place inside the world's largest social network. Inside this black box, non-transparent algorithms are deciding what kind of content will become a part of our reality, what will be censored or deleted, which ideas will spread and what news gain most visibility. They are also defining new forms of labor and exploitation. Users are no longer clients. We only provide data, which serves as raw material for the production of digital profiles — a key commodity on internet stock markets.
Facebook Algorithmic Factory generates an enormous amount of wealth and power by creating a deep economic gap between those who own and control the means of production and their users, who often live below the poverty line. The layers of algorithmic data processing may conceal new forms of human rights violation, novel mechanisms for exploitation and manipulation that we no longer control. Our first step in fighting them back is to make them visible.

Vladan Joler and SHARE Lab / SHARE Foundation

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.



Vistoria And Albert Museum

Nye Thompson (UK)

The Seeker

The Seeker is a machine entity — a proto-AI — that travels the world virtually and describes what it sees. The project explores ideas of the emergent machine gaze and the hidden virtual power structures behind it. *The Seeker* travels the internet looking through compromised surveillance camera eyes and uses image recognition technology to interpret these visions. Named for Ptah-Seker, the artist/technologist god of the Ancient Egyptians, who created the world by speaking the words to describe it, this project looks at how the act of describing the world might establish a whole new worldview for machines and humans alike.

The Seeker is an exploratory, data-generating system. The artist analyzes its output and uses this to create further physical outcomes (artworks) such as the giant "drawing" *Words That Remake The World*. This drawing contains all the words and concepts that *The Seeker* has used to describe what it saw in the tens of thousands of locations it has "visited."

The development of this project was generously supported by Arts Council England.
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Joy Buolamwini (US)

Gender Shades

Joy Buolamwini and Timnit Gebru investigated the bias of AI facial recognition programs. The study reveals that popular applications that are already part of the programming display obvious discrimination on the basis of gender or skin color. One reason for the unfair results can be found in erroneous or incomplete data sets on which the program is being trained. In things like medical applications, this can be a problem: simple convolutional neural nets are already as capable of detecting melanoma (malignant skin changes) as experts are. However, skin color information is crucial to this process. That's why both of the researchers created a new benchmark data set, which means new criteria for comparison. It contains the data of 1,270 parliamentarians from three African and three European countries. Thus Buolamwini and Gebru have created the

first training data set that contains all skin color types, while at the same time being able to test facial recognition of gender.

Joy Buolamwini, Founder of the Algorithmic Justice League and Poet of Code
Buolamwini, J., Gebru, T.: "Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification." Proceedings of Machine Learning Research 81:1 — 15, 2018 Conference on Fairness, Accountability, and Transparency
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Birgitte Aga (UK), Coral Manton (UK)

Women Reclaiming AI

Women Reclaiming AI (WRAI) is a collaborative AI voice assistant and activist artwork made by a growing community of self-identifying women. Creating a platform for collective writing and editing, the project co-creates an AI that challenges gender roles.
WRAI is a response to the pervasive depiction of AI voice assistants gendered as women; subordinate and serving. It aims to reclaim female voices in the development of future AI systems by empowering women to harness conversational AI as a medium for protest.
You can speak to the evolving voice assistant at womenreclaimingai.com and see its visual representation (GAN — generative adversarial network) created from a DIY data set of images of the women participating and other women the collective find inspirational.

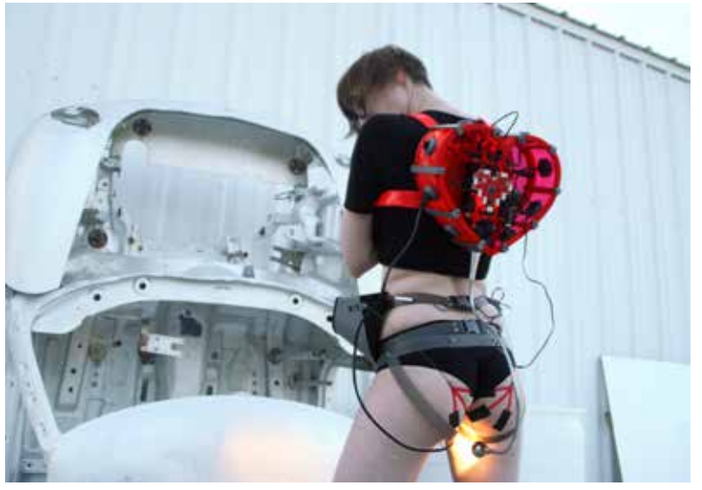
Women Reclaiming AI is created by Birgitte Aga and Coral Manton in collaboration with a growing community of self-identifying women. The project is funded by the Arts Council England and supported by Knowle West Media Centre, Intercity and i-DAT.
womenreclaimingai.com
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Caroline Sinders (US)

Feminist Data Set

Feminist Data Set is an ongoing multi-year art project that combines lectures, workshops, and calls to action to collect feminist data to create a series of interventions for machine learning. What is feminist data? Feminist data can be artworks, essays, interviews, and books that are from, about, or explore feminism and a feminist perspective. The creation of this feminist data set will act as a means to combat bias and introduce the possibility of data collection as a feminist practice, aiming to produce a slice of data to intervene in larger civic and private networks. This project is largely based on the idea that to remove bias within machine learning, the "removal of bias" itself has to be manifested into a "thing" to teach or sway the algorithms. By using workshops, the artist starts to define the parameters for feminist words, interactions, their definitions, their origins and, potentially, their creators.

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.



Mark Koch

Sarah Petkus (US)

SHE BON

A wearable platform for sensing and indicating human arousal

The *SHE BON* project is a collection of body augments which sense aspects of the wearer's physical state in order to communicate their level of arousal. Collectively, the systems that have been developed for this project make up a human-computer interface capable of orchestrating sensor input from the body in order to influence mechanical and electronic forms of performative output which express subtle aspects of the wearer's physical state in a manner that characterizes their sexual identity.
The primary goal of the *SHE BON* project is to promote a general dialogue about sexuality; one that is open, approachable, and able to have a positive impact on human social-emotional health at large. To achieve this, all stages of the project's development are documented and made public so that the practical engineering challenges the artist encounters during this process may also act as a catalyst or "gateway" for the greater dialogue about humanity's relationship with sexuality.

www.zoness.com

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Emanuel Gollob (AT)

Doing Nothing with AI

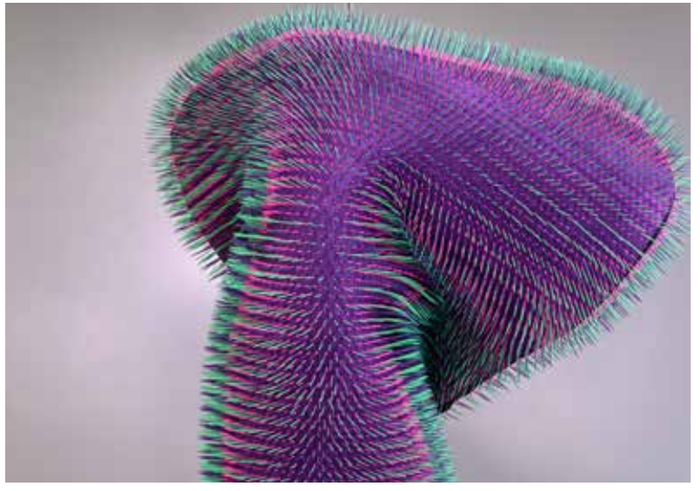
A neuroreactive robotic installation

In times of constant busyness, technological overload and the demand for permanent receptivity to information, doing nothing is often seen as provocative and a waste of time. However, enjoying a moment of inaction and introspection while letting our minds wander and daydream may be more productive than staying constantly busy. In order to promote a doing-nothing state in 2019, Emanuel Gollob and his team created a neuro-reactive installation, using live EEG-measurements and a real-time adapting robotic choreography. Over time a generative algorithm increasingly learns to move the installation in a way that best supports the user's mind-wandering process.

CORE TEAM: Emanuel Gollob (AT) — design & concept, Magdalena May (AT) — concept & research
ADVICE AND SUPPORT: Johannes Braumann (AT) Laboratory for Creative Robotic — robotic support, Dr Orkan Attila Akgün (AT) — neuroscientific support, Magdalena Akantisz (AT) & Pia Plankensteiner (AT) — Graphic Design

Supported by Vienna Business Agency. Parts of this iteration were produced at Design Investigations studio at the University of Applied Arts Vienna.

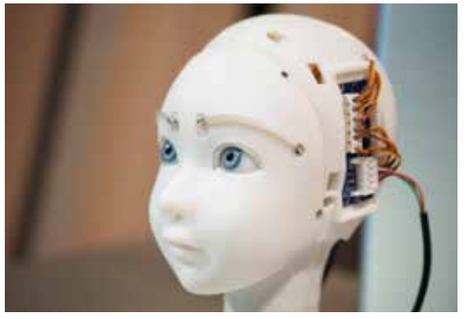
This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.



Takayuki Todo (JP)

SEER: Simulative Emotional Expression Robot

SEER is a compact humanoid robot developed through intensive research into the gaze and facial expressions of human beings. The robot is able to focus its line of vision on a certain point without being thrown off by the motion of its neck. Because of this, the robot seems to have its own intentions to follow people and its surroundings, and to pay attention to them. A camera sensor helps it to observe with an interactive gaze. The robot's expression can also be enriched by depicting its eyebrow curve with soft, elastic wire so that it gives the impression of emotions.



Ars Electronica

With technical support from Takanari Miisho, Yuki Koyama

This project is supported by the Japan Foundation as well as presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Jessica In (UK/AU)

NORAA — Machinic Doodles

How do we recognize objects when we draw them with lines and strokes? What rules do we use to draw in a particular order from one point to another? And can a machine be taught to learn to draw on its own, without being given explicit instructions? What insights does this provide into the human process of drawing?
Machinic Doodles is an interactive game installation that examines the collaboration between a human and a robot named *NORAA*, an artificial intelligence that is learning to draw. It studies how humans express ideas through strokes in a drawing, and how a machine can learn to draw using an artificial neural network.

Jessica In, 2018 (UK/AU)
jessicain.net
George Profenza (UK/RO), Sam Price (UK)

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Ilmar Hurkxkens (NL), Fabian Bircher (CH)

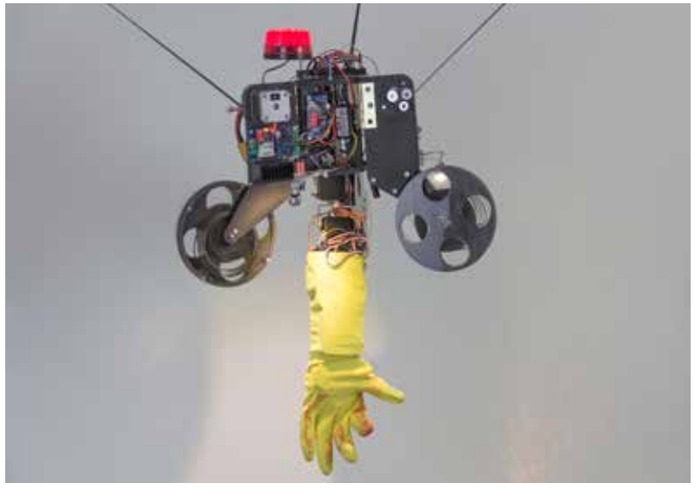
UngenauBot

The work *UngenauBot* combines highly developed robot technology with an everyday rubber glove performing banal activities. By deliberately exploiting empirical errors in robotic systems and artificial intelligence, this work demonstrates the limits of technology when things don't go according to plan. *UngenauBot* is suspended from three points enabling free movement in space. For interaction, it has access to various vision sensors, a speaker and a hand with a hygienic yellow rubber glove. The humanoid hand of the otherwise very technoid robot serves to establish an affective response in the viewer. In this installation, the *UngenauBot* will attempt to set a table with silverware.

The insufficiency in machine vision and robotic control systems generate unpredictable situations which render it a clumsy and spontaneous artifact. *UngenauBot* will recognize various tasks at hand, announce them over the integrated speaker and execute them. Various moments of inaccuracy will become apparent with which the audience can empathize. The questionable services of the *UngenauBot* expose the robotic system as equally ignorant and imperfect in the relation between human and robot.

Supported by Migros-Kulturprozent Digital Brainstorming

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.



Nicky Johnston

Oxfordians (UK, INT), Aidan Meller (UK), Lucy Seal (UK)

Ai-Da Robot Artist

Ethics of our Future Technologies

As the world's first ultra-realistic AI robot, *Ai-Da* is uniquely placed to help us think a little more deeply about art, creativity, and how our varied futures might look. As the world struggles to morph around a destabilizing environment and a rapidly changing technological landscape, the notion of identity when we collaborate so closely with machines and AI becomes increasingly urgent. As 'The Other,' *Ai-Da* reflects ourselves back to us through her drawing, performance art and collaborative paintings and sculptures that involve human, AI and digital inputs. George Orwell and Aldous Huxley's cautionary writings remain relevant — ethical discussions are needed to direct the development of new technologies in a direction that protects rather than exploits the vulnerable sectors of our world, including animals and the environment.

Creative director: Aidan Meller (UK)
Curator: Lucy Seal (UK)
Engineered Arts (UK), Salaheldin Al Abd (EG), Ziad Abass (EG), Adam Meller (UK), Aidan Gomez (CA), Charline Le Lan (FR), Alex Kafoussias (SE), Christian Johnstone (UK), Petra Cozianu (RO), Zoe Corsellis (UK), Javier Alba-Tercedor (ES), Marco Castellani (IT)

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Martin Hieslmair

Adam Harvey (US), Jules LaPlace (US)

MegaPixels

MegaPixels is an independent art and research project that investigates the ethics, origins, and individual privacy implications of face recognition image datasets and their role in the expansion of biometric surveillance technologies. The project aims to provide a critical perspective on machine learning image datasets, one that might otherwise be overlooked by academic and industry-funded artificial intelligence think tanks. Each dataset presented on this site undergoes a thorough review of its images, intent, and funding sources.

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Charlotte Jarvis (UK)

In Posse

In Posse is a work in progress. Artist Charlotte Jarvis is collaborating with Prof. Susana Chuva de Sousal Lopes in Leiden and Biotehna / Kersnikova Institute in Ljubljana to make the world's first "female" semen. The project is being developed in three parts — firstly, Jarvis is on a journey to grow spermatozoa (sperm cells) from her body. At the same time, she is developing a female form of seminal plasma (the fluid part of semen) using material donated by multiple women, trans and gender non-binary people. Finally, Jarvis is using the female semen developed for *In Posse* as part of a series of re-enactments of the ancient Greek festival of Thesmophoria. *In Posse* is a Latin term with a literal meaning of "before we are born." It refers to something which is possible, which has potential, but is yet to be called into existence. Jarvis and Prof. Lopes are striving for a form of technological, biological and creative activism.

Collaborator: Prof Susana Chuva de Sousal Lopes at the Leiden University Medical Centre; This project is supported by: MU Gallery Eindhoven and Kapalica / Kersnikova Institute; Video and Film support: Eleni Papazoglou and Miha Godec

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

Miha Godec

EMAP/EMARE

EMAP (European Media Art Platform)

EMAP (European Media Art Platform) annually awards production grants to outstanding European media artists and supports research, production, presentation and distribution of media art in Europe and beyond.
Aiming to enable European artists to collaborate on projects and create closer bonds between European media organisations, the platform was founded in 2017 and offers grants in 11 member institutions: Ars Electronica (Linz, Austria), Bandits-Mages (Bourges, France), FACT (Foundation for Art and Creative Technology, Liverpool, United Kingdom), IMPAKT (Utrecht, Netherlands), Kontejner (Zagreb, Croatia), LABoral Centro de Arte y Creación Industrial (Gijón, Spain), m-cult (Helsinki, Finland), Onassis Stegi (Athens, Greece), RIXC (Riga, Latvia), WRO Center for Media Art Foundation (Wroclaw, Poland), lead organisation: Werkleitz Centre for Media Art (Halle, Germany).
The EMAP program is scheduled for the years 2017-2021 and is the largest international platform of artistic exchange and residency projects for media artists in Europe.

EMAP is co-funded by the Creative Europe Programme of the European Union. *http://www.emare.eu/*

Quimera Rosa (ES/AR/FR)

Trans*Plant: May the Chlorophyll be with/in you

*Trans*Plant* is a transdisciplinary project, initiated by Quimera Rosa in 2016, that utilizes living systems and is based on self-experimentation: it is a process that involves a “human > plant” transition in various formats. The project juxtaposes disciplines such as arts, philosophy, biology, ecology, physics, botanics, medicine, nursing, pharmacology and electronics.

*Trans*Plant* aims to develop a project that involved in the current debates surrounding the Anthropocene from a perspective not based on “human exceptionalness and methodological individualism” (Donna Haraway). Instead, it addresses the world and its inhabitants as the product of “cyborg processes,” of “becoming with” (Vinciane Despret) and of “sympoiesis” (Haraway).

The greatest problem with the dominant ecology is that it is based on the notion of “nature,” a notion created historically to separate humanity from the rest of the universe and establish a colonial relationship. The binomial culture/nature structures an almost infinite list of other binomials found in modern Western thought: man/woman, white/non-white, straight/queer, science/witchcraft, adult/child, normal/abnormal... The second term of each binomial is associated with nature and is therefore subjected to the same regime of violence. Through the maximization of heterotrophy, a necropolitics is constituted that literally “consumes” everything on this planet. “Protecting nature” seems to be a bad idea... It is strange that we have come to accept that an individual, delimited by the skin, constitutes a living being, but the planet as a whole doesn’t. It is time to conceive of “ungridable ecologies” (Natasha Myers), or “un-greening the green” (Jens Hauser).
In order to be able to think about a non-anthropocentric ecology, we need to move from identities based on essences to identities based on relationships. A human> plant transition process that includes an intravenous chlorophyll protocol generates fears, fantasies, and judgments, which in turn open a debate about the identity system. A self-experimentation process is not an individual’s process, it is always a collective one. Obtaining a pure molecule of chlorophyll is as hard as getting testosterone from the pharmaceutical and biomedical industry or the legal and health system. All life is patented.

Miha Fras

Trans*Plant would not be possible without the different ecosystems of which it is part.

March 2016: Beginning of the Trans*Plant project, which aims to experiment, within the current environmental crisis, on a process that engages a body towards a human>plant transition. December 2017: First chlorophyll intravenous injection, at Kapelica Gallery, in Slovenia. March 2036: The annual earth resources are exhausted and we witness the final shutdown of the global Internet. December 2037: A bio-hacker community decides to connect a VPN to Mycorrhiza — the network that allows earth plants to exchange nutrients and information — in order to establish a symbiotic alliance with them and to try to reverse the situation.
*Trans*Plant*: *May the Chlorophyll be with/in you* is a mixed-media installation project that aims to present the work behind the *Trans*Plant* project.

Initiated three years ago, it combines biomedical research, performance and speculative fiction. It is a piece based on haptic and hybrid low-tech-nologies, where leftovers from the past and the future get entangled. Videos, written narratives, scientific excerpts, mycorrhiza interacting with the audience, and DIY/DIWO biotechnological materials are part of the elements that establish the connection between the theme and the transdisciplinary and experimental form of this lab installation.

With the support of: Hangar.org (ES), Emmetrop (FR), Bandits-Mages (FR), GeniAlis (FR).

The work was realized within the framework of the European Media Art Platforms EMARE program at Ars Electronica Linz GmbH & Co KG with support from the Creative Europe Culture Program of the European Union. Avec la Participation du DICRéAM — CNC

Amar Belmabrouk

Margherita Pevere (IT/DE)

Wombs

Wombs looks at my own female body, whose leaky materiality is entwined with environmental relations by the gesture of taking hormonal contraceptives. Slugs are hermaphroditic allies in the exploration of inner and outer ecologies of fleshy desire. In the installation, a custom-made extra-bodily organ hosts two cell cultures in a hybrid ecosystem. My own vaginal epithelial cells and slug egg cell share reagents and stage a dance of the two organisms at a cellular level. *Wombs* investigates the body as a biochemical cyborg: hormonal contraceptives modulate human sexual organs to prevent pregnancy, thus accompanying my own sexuality. Moreover, they inscribe my own experience into a biopolitical sphere, for, once released into the ecosystem through urine, they may trigger the endocrine system of other organisms. The work asks how they might affect hermaphroditic slugs, and wonders how slugs' sexual behavior might affect human bodies. In so doing, the piece prompts a critical re-thinking of the discourses on contraception and sexuality as a female-only, human-only experience enclosed in one's own body.

Biotechnological advisor: Gjino Šutić — UR Institute
Production manager: Josipa Vukelić, Jurica Mlinarec — KONTEJNER
Photography: Sanjin Kaštelan, Margarita Koši, Margherita Pevere
Video: Ivan Šardi

The project is part of Pevere's practice-based PhD research at Aalto University. Preliminary research at Biofilia Laboratory — Base for Biological Arts, Aalto University.

This project is realized within the framework of the European Media Art Platforms EMARE program at KONTEJNER | bureau of contemporary art praxis in collaboration with UR Institute, with the support of the Creative Europe Program of the European Union

Marco Barotti (DE/IT)

Clams

In nature, clams are detectors of pollutants; they serve as tiny filtration systems. Inspired by this natural phenomenon, Marco Barotti is now presenting his new work *Clams*, a kinetic sound installation triggered by water quality. Real-time data is streamed by a sensor and converted into an audio signal. The audio signal generates a live evolving soundscape which initiates the opening and closing movements of the *Clams* sculptures. Sound and motion unite to create an experience that allows the audience to see and hear the water quality in real time. The *Clams* sculptures are made from recycled industrial plastic waste. The artwork intends to raise awareness about water and plastic pollution.

Clams is a project realized by Marco Barotti within the framework of the European Media Art Platforms EMARE program at WRO Art Center with support of the Creative Europe Culture Program of the European Union.

Co-funded by: C-Takt, Oerol Festival, and Transnatural
Supported by: “In-Situ” water quality measurements and Dayton Audio
Many thanks to: Anna Anderegg for conceptual advises, Pim Boreel for Hydro4Live development

Joana Moll (ES)

The Hidden Life of an Amazon User

The Life, Lessons & Rules for Success by Jeff Bezos was purchased at Amazon on June 17, 2019. In order to purchase the book, Amazon forced the customer to go through 12 different interfaces made of large amounts of code. Overall, we were able to track 1307 different requests to all sort of scripts which equaled 8724 pages of printed code and 87.33Mb of data. Amazon’s business model is based on “obsessive costumer focus,” which entails the continuous tracking of customer behavior in order to amplify the monetization of the user. Thus, the 87.33Mb of code responsible for tracking user activity that were involuntarily loaded by the customer through the browser, relentlessly put Amazon’s core money-making strategy to work. Moreover, all the energy needed to load all this data was effectively unloaded upon the customer.

The piece narrates the journey of the customer within the labyrinth of interfaces and code that allowed them to buy Jeff Bezos’s book, while also revealing the mounting energy costs that were unwittingly paid for by the Amazon customer.

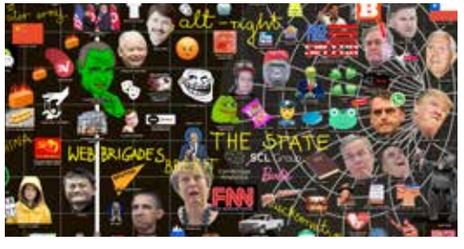
This work was realized within the framework of the European Media Art Platforms EMARE program at IMPAKT with the support of the Creative Europe Culture Program of the European Union.

DISNOVATION.ORG (FR/PL)

Online Culture Wars

The map *Online Culture Wars* is an overlay of hundreds of politicized memes, along with influential political figures and symbols. Taking the Political Compass as a framework, this cartography offers a symbolic representation of online ideological and political debates, and their growing polarization, politicization and radicalization orchestrated by different political and cultural influencers. It is designed as a discussion starter, intended to visualize and contextualize the ongoing online culture wars. The video *Online Culture Wars* focuses on the political instrumentalization of the tools, techniques, and infrastructures of the web, with particular attention to the social media influence ecosystem, and online manipulation of opinion.

Conception: DISNOVATION.ORG (2018-2019);
in collaboration with Baruch Gottlieb
With The Support Of: NRW-Forum Düsseldorf (DE), MU artspace Eindhoven (NL), Institut UTINAM Besançon (FR) (with José Lages), HMKV Dortmund (DE).
The Work was realized within the framework of the European Media Art Platforms EMARE program at m-cult with support of the Creative Europe Culture Program of the European Union.



MAEID — Daniela Mitterberger (AT), Tiziano Derme (IT/AT)

The Eye of the Other

Interspecies communication between humans and bats

The Eye of the Other delves into non-verbal communication between humans and bats, through the study, translation and manipulation of the bat's echolocation. This multimodal immersive artwork derives from the desire to transcend the limitations of our living experience by exploring the deeper meaning of mutualistic relationships and interspecies communication between humans and animals, juxtaposing the animals' gaze and the human gaze. It reflects on how digital live/streaming technologies and machine intelligence can be used to alter human senses and enhance new formats of communication and authorship, empathy and co-existence. The artwork lets the human and the non-human, the local and the remote collide and produces new cultural spaces, formed by the meta-domain of a new language. This topological turn foreshadows a possible future in which the clear borders of humans and others are blurred and a multi-species society might be formed. The gaze should not be understood as something one has or applies, but rather as a depiction of the relationship into which one enters.

Scientific staff: Dr. Ralph Simon — Animal Ecology — Ecological Sciences VU University Amsterdam, Andrea Reni — software developer.
Interface development: Ralph Simon, Andrea Reni, Daniela Mitterberger, Tiziano Derme

This project was realized within the framework of the European Media Art Platform EMARE program at Bandits Mages with support of the Creative Europe Culture Program of the European Union.

Birk Schmithüsen (DE)

Speculative Artificial Intelligence

Exp. #2 (conversation)

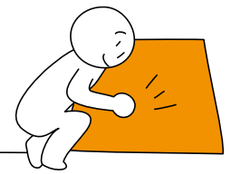
This work consists of a series of aesthetic experiments designed to make processes of artificial neural networks perceptible to humans through audiovisual translation. *Exp. #1* examines inner behavior during the prediction and learning process. In the experiment, a network is visualized by a light object, with the state of each neuron represented by a corresponding LED. *Exp. #2* questions an AI's capacity for empathy and purpose while communicating with a second AI. Both systems are embodied by a light or sound object and can receive the messages of the other. The spherical light object with a diameter of 80cm consists of a chaotic heap of 95m LED Stripe, a microphone and an embedded AI computing device. It can hear sounds and create images. The sound object in the form of a dodecahedron of black, opaque plexiglas with the same diameter is equipped with eight speakers, a camera and the second AI system. It can see images and play sounds. In the exhibition, the two systems are in an ever-changing audiovisual conversation.

Conceptual support by Artificial Intelligence Center, University of Oviedo at Gijón. 3D calibration of volumetric display by Felix Bonowski. Coding by Marcus Ding.

Realized at LABoral Centro de Arte y Creación Industrial in Spain within the framework of the European Media Art Platform EMARE program with support of the Creative Europe Culture Program of the European Union.

Additional production support by ArtesMobiles

THE PRACTICE OF ART & SCIENCE



The rapprochement, as it were, of art and science, the artistic exploration of new applications, is a key factor in the increasingly social dimension of new technologies in order to comprehend how reciprocal human-machine relationships and interactions among individuals and globally networked systems can not only be better understood but, above all, better designed. Since the inception of the Festival in 1979 by artist Hubert Bognermayr, scientist Herbert W. Franke and journalist Hannes Leopoldseder, art and science have always been a focal point of Ars Electronica. In 1996, the increasing interest in collaborations among artists and scientists resulted in the foundation of two pillars of learning, research and presentation: Ars Electronica Center as “Museum of the Future” and Ars Electronica Futurelab as “Laboratory for Future Innovations.” As a sort of melting pot, where different cultures of knowledge can — or should — mingle and discover their synergies, Ars Electronica has been a place for artists, scientists, researchers, designers and engineers to cooperate on multifarious projects for years. Based on a collaboration with CERN, which started in 2011, a plan evolved for a network of art and science residencies on a European scale.

Ever since its initiation, the European Digital Art and Science Network with the partners ESA, ESO and Fraunhofer MEVIS sparked interest from artists as well as institutions and continued to grow. This year *The Practice of Art and Science* is particularly focusing on collaborative projects in the European context and beyond, as well as interdisciplinary approaches. Crossing boundaries in all conceivable ways — the curiosity of the pioneer — has always been within the DNA of art and science.

g.tec medical engineering GmbH (AT)

Unicorn — The Brain Interface

The *Unicorn Hybrid Black* is a high-quality wearable EEG-headset for Brain-Computer Interface (BCI) applications to perfectly acquire brain waves. Developers, artists and makers are able to acquire and process brain signals, ranging from simple display of the signals, to design and control attached devices or interact e.g. with artistic installations, toys, computer programs or applications. Visit the installation and control a Sphero robot, create a painting or spell some text with the brain interface.

vog.photo

g.tec medical engineering GmbH (AT)

BR41N.IO Hackathon

The Brain-Computer Interface Designers Hackathon

A BCI provides a direct link between the brain and an external device. 20 years ago, BCIs could only spell or move computer cursors. Today, BCIs are being used in many different fields of neuroscience, such as motor rehabilitation for stroke patients, assessment of and communication with coma patients, control of devices for disabled people, cognitive training or neuromarketing. Machine learning, dry electrodes, wireless electrode caps, and other technologies are making BCIs more powerful and practical for a growing number of users.
The *BR41N.IO* Brain-Computer Interface Designers Hackathon Series has been created to show these current and future developments, and the unlimited possibilities of BCIs in creative or scientific fields, and brings together engineers, programmers, designers and artists. Each team must design and build a wearable BCI-headpiece that can measure brain activity in real-time to create any sort of interaction. The hacking projects use EEG electrodes and amplifiers, and challenge programmers to code an interface that enables them to control devices, robots or applications, post messages on social media, draw paintings, or a myriad of other applications by using their thoughts only. *BR41N.IO* also challenges creative minds to design a BCI headset with 3-D printers, handcrafted materials and sewing machines. Children are invited to create their own Brain-Computer Interfaces and can take their handicraft with them. *BR41N.IO* aims to promote awareness of artificial intelligence, life science, art and technology, and how these can merge into innovative and exceptional BCI systems.

BR41N.IO is organized by g.tec neurotechnology GmbH
BR41N.IO is sponsored by the IEEE Brain Initiative

BR41N.IO Linz 2018, vog.photo

mindBEAGLE ©g.tec medical engineering GmbH

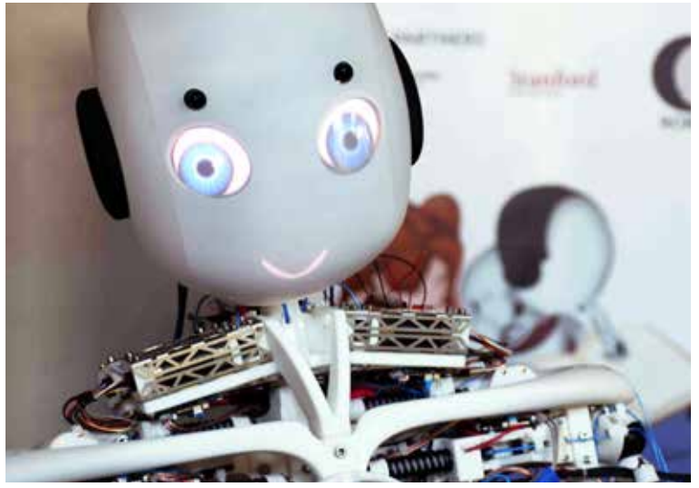
recoveriX ©g.tec medical engineering GmbH

g.tec medical engineering GmbH (AT)

Bugfix the Brain

Rehab Technologies for Medical Professionals and Patients

Imagine being able to think, hear, and feel — but not to move or communicate. The exhibition *Bugfix the Brain* focuses on patients who suffer from motor disabilities due to stroke or disorders of consciousness and shows state-of-the-art rehabilitation and assessment tools based on Brain-Computer Interfaces. Neurologists, physical therapists, caregivers and patients are welcome to test these brain rehabilitation technologies on themselves.
recoveriX is the first rehabilitation system for stroke patients that pairs mental activities with motor functions. For example, if a stroke patient imagines a hand movement, the BCI system gives a visual feedback through Virtual Reality and feedback through muscle stimulation at the same time. This fosters brain plasticity and patients learn to move hands again.
mindBEAGLE is a pioneering method that can be used with patients who are living with coma, unresponsive wakefulness syndrome, minimal consciousness or locked-in syndrome. *mindBEAGLE* uses auditory and vibrotactile stimulation to assess whether a patient is conscious. If patients are able to perceive stimuli given by the *mindBEAGLE* system, they might be able to communicate and answer Yes/No questions!
The *Unicorn-Speller* is an affordable Brain-Computer Interface that allows patients to write words and sentences just by thinking. This is an important tool for completely paralyzed people to establish communication.



Max Haarich (DE), Rafael Hostettler (DE)

Republik Užupis

Explore the Unthinkable

The Embassy of the Republic of Užupis to Munich is a one of a kind initiative that combines arts, technology and politics to promote innovations that are more accessible, more inspired and more ethical. The initiative focuses on artificial intelligence (AI) and its possible consequences for society.
With consulting, workshops, talks, and parties, the embassy brings together cutting edge AI engineers, rebellious artists and high-ranking policy makers. Besides ambassador H.E. Max Haarich, six consuls work for the initiative including the humanoid Roboy, who is responsible for naturalizations. This makes it the world's first artificially intelligent diplomat. The Užupis embassy is one of the rare arts-related initiatives actively engaging in international policymaking for AI. They are a partner of the German BMBF's Science Year on AI, a partner of the EU's AI Alliance and a member of the German Association of the UN. Is this serious or is this crazy? Definitely, yes!

Ryo Kishi (JP)

Anti Conductor

Struggle in the flow

Anti Conductor embraces the beauty of struggle. In our society, individuals tend to go with the flow of their environment. It's human nature because it's easier to survive that way. But it's also monotonous and boring. If no one tries to go against the flow, nothing is going to change. On the other hand, when someone tries to escape from the flow, they will definitely face the risks of being pulled back into the flow. Because society wants to maintain its structure. The image of an individual struggling in the flow is full of power and energy, even if the efforts might not pay off. It's simply fascinating to see an individual's attempt to break the norm of their environment, and wish for the revolution that could come from it.

Takayuki Hirai (JP), Yasuaki Kakehi (JP)

(un)shaped

This installation, named *(un)shaped*, utilizes bubbles in water as a medium. Pouring droplets into water gently from the top, bubbles are generated in it. This phenomenon is called an antibubble, which is a droplet encapsulated by a thin film of gas. Unlike normal air bubbles, antibubbles float slowly inside the liquid and often show iridescent surface reflections. In this installation, the amount of droplets from nozzles are computationally controlled. By pouring droplets, the antibubbles start to form various patterns underneath the water's surface. After inflating to a certain size, they leave the surface and float in the water, then disappear after a while. Through these periodic phenomena, continuous morphing from computationally controlled forms to organic ones, mediated by the environment, is shown.

Yasuaki Kakehi Laboratory at The University of Tokyo
This project is supported by the JST ERATO Project

Yuri Tanaka (JP), Pavle Dinulović (RS), Umut Kose (TR), Chris Bruckmayr (AT)

Particle Post

Letters from the Universe

We are all in a constant correspondence with the universe. It speaks to us ever so subtly, showering us with invisible remnants of our mutual distant past, across the magnitude of space and time. Yet in the infinitely grand scale of all things universal, one tends to neglect the infinitely small.
It is this omnipresent chronicle of the universe that is our most intimate connection to the everywhere and always, shared with us through the smallest of postcards and parcels. Within the journey of each traveling particle there lies a piece of a common history, a memoir of a voyage spanning billions of years, connecting us, in this very point in space and time, to the dawn of our universe.
Receiving cosmic muons (one of the fundamental particles constantly created by the interactions of the cosmic rays at the top of the atmosphere) through a scintillator detector, this postbox subtly emits sound and light as a direct consequence of every particle it detects. It is through this process that the implied aesthetics of the unperceivable are explored, as are the means by which it could be indirectly appreciated in different ways through the bodies and minds of humans.

This work is granted by Nomura Foundation, THE ASAHI SHIMBUN FOUNDATION, and JSPS KAKENHI Grant Number 19K13027

Kim Albrecht (DE)

Distinction Machine

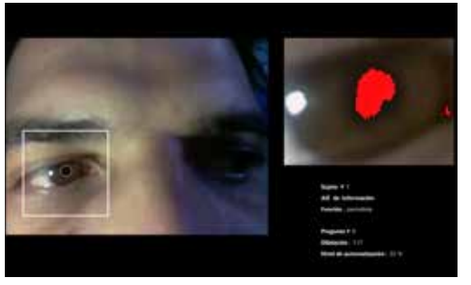
In the midst of exploring and understanding cyberspace, it is intriguing to ask about the boundaries of computation itself.
Ludwig Wittgenstein said the limits of our language define the limits of our world. But what are limits of the language of computation? And how are they defining our worldview?
This set of experiments asks the computer to perform a simple task, placing two differently-colored rectangles in the same position in a three-dimensional space. Since neither of the two will be facing the other, the machine will be confronted with the problem of which one to show. The decision for one color and against the other will take place at the lowest level of computation, in which electricity flows through the silicon circuits. The computer represents one or the other, but never an in-between. The vagueness of our world, its in-betweenness, cannot be computed. This certainty in the uncertain shines through on every level of mediation between the computer and ourselves.

Distinction Machine is a project by Kim Albrecht in collaboration with metaLAB (at) Harvard, which is a part of the Berkman Klein Center for Internet & Society.

Yonlay Cabrera (CU)

VOIGHT-KAMPFF

The project is based on a procedure for measuring the involuntary ocular changes that happen in a group of people, determined according to categories that correspond with the “Ideological Apparatus of State” (Louis Althusser) used by the Cuban Government. The people are submitted to questions that “stress-test” the normal values in order to determine to what extent they reproduce the ideal behaviors internalized by the ideological apparatus.



Direction and concept: Yonlay Cabrera Quindemil
Programming and hardware: Gustavo Viera López, Antonio Serrano Muñoz
Psychological advisor: Yunier Soca Hernández
Production and attendance: Yandy Sanabria González
This project was supported by Studio 21 Grant, Development Center of Visual Arts, Cuba.

Martin Reinhart (AT), Virgil Widrich (AT)

tx-mirror

The installation *tx-mirror* was created for the exhibition “Art in Motion. 100 masterpieces with and through media” at ZKM | Center for Art and Media Karlsruhe. It is a further development of the film technology “tx-transform” invented by Martin Reinhart in 1992.
As in earlier works by the duo Martin Reinhart and Virgil Widrich, familiar perception is questioned and expanded through intuitive interaction. Visitors can look at themselves in a magical mirror and explore the laws of a universe where time and space have been reversed.
The installation also pays homage to the Polish video artist Zbigniew Rybczynski, whose film *The Fourth Dimension* has inspired an entire generation of artists.

Concept: Martin Reinhart, Virgil Widrich
Programming: Matthias Strohmaier
Sound design of the film documentation: Siegfried Friedrich;
Thanks to Peter Weibel and Leo Coster
Produced on behalf of ZKM | Center for Art and Media Karlsruhe

STOCHASTIC LABS (US)

Stochastic Labs: Strange Temporalities

Can we continue to distinguish the future from the present? Should we? The rapidly accelerating impact of technology on our society, environment, and selves has, in recent years, left us questioning the boundaries between science and science-fiction, optimism and hindsight, the authentic and the fabricated, the familiar and the unimaginable. But what about the less perceptible boundaries, those strange delineations we draw unaware?

Over the past year, San Francisco Bay Area-based Stochastic Labs has convened a unique group of artists, engineers, scientists, thought leaders, and entrepreneurs to consider these questions through the production of artworks, prototypes, and social provocations. Drawing on the Bay Area's longtime culture of innovation, deep sustainability focus, and multi-generational commitment to independent thinking, these works ask the viewer to be present and future at once — a useful strategy, perhaps, for anyone navigating temporalities mediated by technology. The exhibition includes work by past and current Stochastic Labs residents including Paolo Cirio (Golden Nica recipient, Ars Electronica 2013), Lauren McCarthy and Alexander Reben, as well as pieces from the CRISPR (un)commons residency, which places Stochastic Labs artists alongside the world's leading genomics pioneers at the Innovative Genomics Institute at UC Berkeley.

Curator: Vero Bollow
Text: Vero Bollow
About Stochastic Labs:
Located in Berkeley, California, Stochastic Labs supports creators working at the intersection of art, technology and science, and conversations about the future. Residencies are granted on a rolling basis.
For more information visit *www.stochasticlabs.org*

Alexander Reben (US)

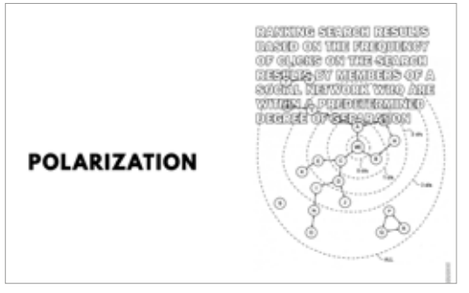
Selections from the Human-Machine Collaboration Series

In the age of machine learning, robotics, and technological dependency, questions of what it means to be human are reflected back to us in new ways by our synthetic creations. Issues of creativity, authorship, inspiration, and philosophy (which have traditionally been recognized as exclusively human traits) come into question as we find ourselves amongst ever more intelligent and capable machines. Works from the human-machine collaboration series explore these questions by using art as tangible philosophy.

Paolo Cirio (IT/US)

Sociality

This artwork documents over twenty-thousand patents exposing socially' hazardous information technology. In *Sociality*, Cirio has collected and rated inventions submitted to the U.S. patent office. He invited participants to share, flag, and ban these technologies designed to monitor and manipulate social behaviors. The patent images and data were obtained by Cirio through hacking the Google Patents search engine. Then he rated the patents and created thousands of compositions with images of flowcharts and titles of inventions, which were published on the site *Sociality.today*. The visual compositions on the website were printed in form of posters and a coloring book for informing on devices that enable discrimination, polarization, addiction, deception, and surveillance. The concept of turning patents into vehicles for regulations aims to exploit intellectual property law as a tool for democratic oversight. This work integrates both the dystopia surrounding technology and the utopia of democratic oversight with flowcharts of patents taking the form of documentary and protest art. With this problematizing piece, Cirio exposes evidence of social manipulation and questions the ethical, legal, and economic structures of such technological apparatuses. In the exhibition, the public confronts large-scale compositions with hundreds of images of flowcharts that abstractly invoke the complexity and magnitude of such uncanny plans to program people.



Lauren McCarthy (US), David Leonard (US)

Virtual Caring

According to AARP, almost 87 percent of seniors would like to stay in their home as they age. With millions of aging citizens, we are facing a crisis of care. When confronted with the prospect of caring for aging relatives, artificial intelligence systems like Alexa and Google Home can fill the need for care and stand in for the presence of family, friends, and medical providers. But viewing these systems as utilitarian devices obscures the human responsibilities they carry. Will they be able to serve as advocates for this population? *Virtual Caring* puts the viewer in the role of smart home, offering a lens into the ethical dilemmas that are rapidly being codified into artificial intelligence. Through interactive 360 video created from a real-life scenario, we begin to confront our relationship with AI partners at the end of life.

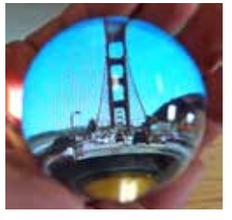
Kal Spelletich (US)

Organs Sound The Body: Artificial Flesh

With *Organs Sound The Body*, San Francisco machine-arts icon Kal Spelletich sets out to create "backup organs for an artist who has never had health insurance," positing a series of hybrid human organs (lungs, heart, kidneys, skin) as playful and reactive metaphors for survival, identity, agency, and responsibility in an era in which increasingly utilitarian values may overshadow technology's capacity for poetry.
A profound meditation on the healthcare crisis, these interactive works also serve as witnesses in the aging process.

JD Beltran (US), Scott Minneman (US)

Liminous



Liminous is a blending of the words "liminal" and "luminous." The word liminal is defined as "of, or relating to, a transitional process," or "occupying a position at, or on both sides of, a boundary or threshold." The word luminous is defined as "full of light; bright or shining, especially in the dark." Using iconic analog forms, sculptural lenses and the moving image, the *Liminous* series explores, expands upon, and blurs the boundaries of cinema, time, light, past, and future.

Chris Kerich (US)

Piles

Piles is a durational video performance piece about bodies. It consists of a collection of over 22 hours of video recordings, livestreamed on Twitch, of the piling up of dead or unconscious bodies in seven different video games. The piece programmatically switches between and juxtaposes these videos, calling attention to how different video games conceptualize, and enforce, their inherent views on death and the body.

Joel Simon (US)

Ganbreeder

Ganbreeder is a massively collaborative online image-making tool powered by generative adversarial networks. Ganbreeder approaches creativity as an explorative dialogue between human, computer, and community. Thousands of users have collaborated on millions of images, each of which results from many individuals contributions.

www.ganbreeder.app

Steven Thompson (US)

Reciprocus

An interdisciplinary exploration of the philosophy of mathematics, collective wisdom, and group intelligence, these works bring the surreal to the surface of the mundane while asking us to consider our interstellar nostalgia and other quintessential questions of the human condition.

Artivive (AT)

ARTIVIVE @ STOCHASTIC

Is Augmented Reality offering a new narrative for artworks? How might artists use this invisible, digital layer to extend creative possibilities? How will viewer interactions within this layer shape the future of the public and private experience of art? In this exhibition, *Artivive* considers these questions together with Stochastic Labs artists… and festival goers.

Jonathan Foote (US)

Skycolor

The *Skycolor* project explores the digital capture of real experience. Specifically, we are attempting to capture the quantifiable as well as the ineffable qualities of California daylight as observed through the window of Stochastic Labs over the course of a summer.

We are experimenting with the temporal and luminous aspects of capturing and reproducing light, visualizing temporal data, and investigating what perceptual qualities digital sensors will destroy, and what qualities they can enhance.

CRISPR (un)commons

To date, the conversation around CRISPR has largely focused on its exceptional potential to cure challenging diseases such as HIV and malaria or doomsday scenarios of epic proportions.
Meanwhile, the scientists developing this radical and compelling technology face a much more nuanced set of investigative and social concerns. This year, a select group of Stochastic Labs artists have been given an unprecedented opportunity to work alongside the very scientists who pioneered CRISPR at UC Berkeley's Innovative Genomics Institute, as they continue to explore the groundbreaking topics that will shape the future of this critical field — and the world as we know it.

Dorothy Santos (US)

Press 1 to be Connected

Press 1 to be Connected presents the telephone as a medium for bio-surveillance and the transmission of biometric data. Phones have been used for decades by clinicians and pharmaceutical companies to collect data on subjects and track drug inventory through electronic data capturing systems such as "interactive voice response systems." This work represents a novel form for interactive storytelling in which the participant can listen to the path of a specific narrative related to our genomic futures.

Alison Irvine (US), Andy Cavatorta (US)

Automation #1 and Automation #2

Inspired by the punched cards of a Jacquard loom, *Automation #1* punches patterns of holes into paper. The underlying data are the genetic sequences most likely to be modified in future humans.
Automation #2 uses a Jacquard loom to automatically weave the data patterns from these genes into long tapestries. The pieces explore the convergence of CRISPR gene-editing technology, machine learning, and automation.

Sheng-Ying Pao (TW)

CRISPR and the Art of Paper

Meet *CRISPaper*: paper made from CRISPR-altered crops. *CRISPaper* revisits the ancient Eastern craft of paper-making in light of current bioengineering techniques developed in Western labs. As the research and design of CRISPR-altered crops currently aims for sustainable agriculture in the developing world, the artist asks us to consider what that notion of sustainability might mean for each of us by drawing on the fragility of paper as metaphor.

Space Exploration Initiative

Per aspera ad astra — 50 years after the Moon

50 years after the Apollo 11 lunar landing, we are seeing another strong push for space exploration: from new and renewed space programs in developed and developing countries to innovative technologies and commercial services from private industry. Along the way, cultural production for outer space becomes crucial for humanity as we expand beyond the earth-bound. In the past, the desire for exploration and expansion had a profound impact on how we imagined planetary futures. What shall we imagine now? In this exhibition, six projects from the Space Exploration Initiative of MIT Media Lab are asking the same question and bringing possibilities to the (im)possible space: All the projects were successfully deployed and performed in a zero-gravity parabolic flight last year. They are hopes beyond solutions, imaginations, more than facts. Our effort addresses outer space as a critical territory that must be inhabited—imaginatively, artistically, scientifically and collaboratively.

Curator and author: Xin Liu (CN)

ARTWORKS:

Xin Liu (CN): **Medusae — From Deep Sea to Deep Space**

Harpreet Sareen (IN): **Fluorovine**

Manuel Muccillo (IT), Valentina Sumini (IT): **Space Human**

Alexis Hope (US): **Space/Craft: Exploring Sculpture in Zero-Gravity**

Maggie Coblentz (CA): **Food for Earthlings**

Nicole L'Huillier (CL), Sands Fish (US), Thomas Sanchez Lengeling (MX): **Telemetrons: A microgravity orchestra --- Instrument 1: Núcleo, instrument 2: Satélite, instrument 3: Monolito**

Uwe Rieger (DE/NZ), Yinan Liu (NZ), arc/sec Lab (NZ)

LightWing II

LightWing II creates a mysterious sensation of tactile data. In this interactive installation, a kinetic construction is augmented with stereoscopic 3D projections and spatial sound. Flexible carbon fiber rods hold a large transparent membrane in tension. A light touch sets the delicate wing-like structure into a rotational oscillation and enables the visitor to navigate through holographic spaces and responsive narratives.
LightWing II is the latest project in a series of immersive installations by the arc/sec Lab for Cross Reality Architecture and Interactive Systems. The research lab is based at the Architecture Department at the University of Auckland. With a focus on intuitive user interaction, the Lab investigates new design solutions through the fusion of material and digital information.

Sound design by Kyung Ho Min. Contributions from Yan Li, Jacky Zheng, Kathy Yuan and Zane Egginton. Supported by the University of Auckland

CARISSMA — Center of Automotive Research on Integrated Safety Systems and Measurement Area Technische Hochschule Ingolstadt (DE)

Smart Traffic — Augmented Cyclists meet Automated Vehicles

Automated vehicles promise to increase safety, but pose a new challenge for vulnerable road users like pedestrians or cyclists. How can we integrate unprotected humans in traffic systems that are controlled by intelligent transportation systems, and how can someone communicate with automated vehicles when there are no human drivers? This installation from CARISSMA/THI combines a driving and a bicycle simulator and allows visitors to become part of futuristic smart traffic systems, while participating in a real scientific experiment. Emerging study results are analyzed in real time and presented on large screens with the aim of making safety research comprehensible and accessible throughout the exhibition.

THI

CARISSMA — Center of Automotive Research on Integrated Safety Systems and Measurement Area Technische Hochschule Ingolstadt (THI): Philipp Wintersberger (AT), Anna-Katharina Frison (DE), Tamara von Sawitzky (DE), Andreas Löcken (DE), Stavros Tasoudis (GR), Martin Nothhelfer (DE), Andreas Riener (AT)

SAFIR — Safety for all — Innovative Research Partnership on Global Vehicle and Road Safety Systems
MenschInBewegung
SAVe — Funktions- und Verkehrssicherheit im automatisierten und vernetzten Fahren

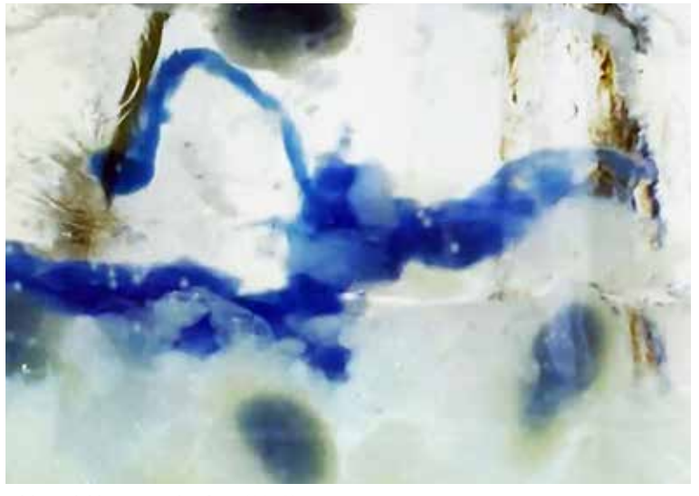
FASHION AND TECHNOLOGY

Fashion & Technology, University for Art and Design Linz (AT)

In the Lab: Processing Fashion

With its inhumane and environmentally destructive production methods, fast fashion has long since surpassed all boundaries. Fashion & Technology offers alternatives to the system with new, sustainable processes. The participatory workshop situation *In the Lab: Processing Fashion* aims to make them visible and tangible.
Material development, shaping techniques and design processes that take place before product solutions, are the focus of attention. The Fashion & Technology students' examples range from a reinterpretation of traditional craft techniques through biochemical kitchen experiments to the emergence-and death-of digital bodies. In a laboratory situation in POSTCITY, these projects are playfully and seriously investigated.
Fashion & Technology is a bachelor's and master's program for contemporary fashion design at the Art University Linz.

Fashion & Technology / University of Art and Design Linz
www.ufg.at/fashion



Miriam Eichinger, *Nonkonform* (2019)

FUTURE MATERIALS

How could the materials of tomorrow look? Today we are conducting research on intelligent (synthetic) fabrics or dreaming of materials that know our needs and adapt to changing situations and circumstances. Against the backdrop of increasing resource scarcity and poor working conditions, sustainable and socially responsible production is an important issue. *Future Materials* is dedicated to giving visitors an insight into the latest developments in the field of material research, which must fulfil a wide range of conditions as well as ecological standards and plays a vital part in finding creative solutions to these questions.

AnotherFarm (JP)

Triaina: Model A

Triaina is an ongoing large-scale art project that utilizes design and technology to create sustainable ecosystems that integrate man-made forms with nature.
Historically, culture and technology have always stood in dichotomy with nature. This project aims to create man-made future ecosystems in which humans can establish a symbiotic relationship with nature. Using a material made from concrete and α-amino acids developed in a collaboration with Tokushima University, we have created sculptures that are designed to be placed on the seabeds of coral reefs to promote growth of microalgae and marine flora. Preliminary research has shown that such materials placed effectively in reefs can help revive coral ecosystems by bringing back marine animals and other organisms that feed off the algae and α-amino acids emitted from the concrete sculptures. In this installation, we exhibit one model of the structures we plan to deploy in seabeds across several locations around the world.

This project is supported by Tohokushinsha Film Corporation and Tokushima University.

Yoichi Ochiai (JP)

The Form of Digital Nature

Perspectives of Digital Nature I

Yoichi Ochiai defines “Digital Nature” as a new perspective on nature, composed of digital media. In Digital Nature, our current norms of physical and recognition abilities are transcended. Extremely enhanced computation and resolution abilities become part of daily life. The humanity of the future may live in Digital Nature, where the very concepts of nature, artificial objects, gravity and time are overturned.
Here, the artificial printed butterfly and dead butterfly are exhibited in the same installation. These digital mimicries of nature show the alternative to our nature and perception.

Developed in collaboration with TOPPAN co.ltd

Yoichi Ochiai (JP), JST CREST xDiversity Project Colleagues (JP)

xDiversity Project

Life and Death in Digital Mimicry

This project aims to explore AI-assisted human-machine integration techniques for overcoming impairments and disabilities. By connecting assistive hardware and auditory/visual/tactile sensors and actuators with a user-adaptive and interactive learning framework, we propose and develop a proof of concept of our *xDiversity AI platform* to meet the various abilities, needs, and demands in our society. Our final goal is a social design and deployment of the assistive technologies towards an inclusive society.

JST CREST xDiversity (Yoichi Ochiai, Tatsuya Honda, Yusuke Sugano, Ken Endo and other colleagues)

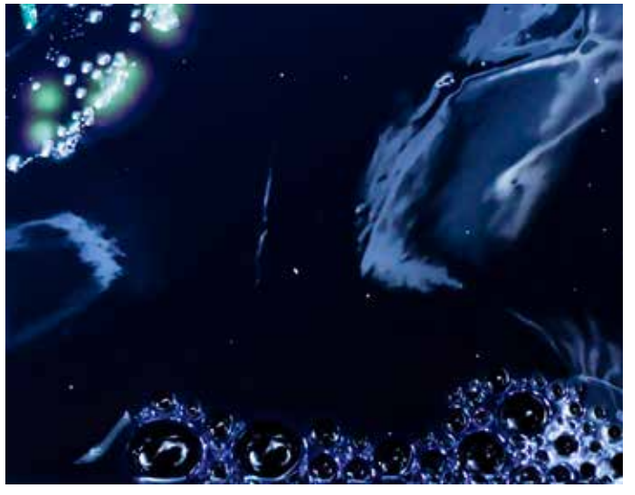
Natsai Audrey Chieza (UK), Karl Aspelund (US)

Mutupo

Origin stories of a multi-planetary diaspora

In the coming century, humans will become a space-faring species, forming settlements on other planets, even traversing the solar system as wandering nomads. Advancing technologies for inter-planetary habitability to enable new market prospecting underpins current goals to achieve low earth orbit to the moon and Mars by 2033. Energy, water, food and material security — innovations developed for extreme conditions “out there” — are set to be generators of wealth and utopian earthly futures.
Seventy-two countries have a space program, while only the government space agencies NASA, CNSA, and RFSA possess human space flight capabilities. Meanwhile, the private sector is propelling advancement. Urgent questions arise: who gets to colonize the life beyond Earth, and what does it mean for those ideas to seed those human futures? Is it possible to dream of other worlds beyond those presented to us through a privatized “cosmos Imaginarium”?
To challenge conceptions of this frontier space is to contest received wisdom of where such explorers might come from, and how, decoupled from Nature and isolated from humanity, they ultimately wish to become. Culture becomes a critical mode of engagement and survival. *Mutupo: Origin stories of a multi-planetary diaspora* explores the theatre of space through a new envisioning of space nomadism and its emergent cultures. We begin with speculative mythologies inherited from DNA: the most ancient yet prescient origin text.

The project has been developed in collaboration with Karl Aspelund, PhD, University of Rhode Island, (US).



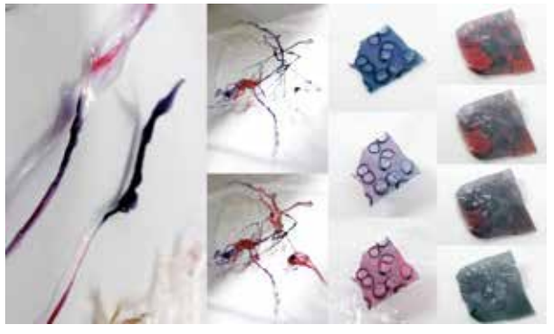
Primitive Labs Biodesign (US)

Organic Primitive Bioplastics

Transforming Objects into Information Displays

Subtle, overlooked everyday interactions with objects carry the potential to transform how we engage with the world. An umbrella is the interface to the rain and climate; a store-bought apple is the interface to the transnational food system; your skin is the interface to your body's health. As Internet of Things further extends digital life to objects and environments, *Organic Primitive Bioplastics* challenges endless data accumulation and memory by posing an ephemeral paradigm for interacting with objects, driven by organic intelligences.
This installation presents a library of smart bioplastics that give objects a "voice" to communicate with us, by converting chemical inputs into human senses — changing color, odor, and form in response to fluids. Artifacts made from the materials act as information displays which provide a glimpse into a new material reality, a world where everyday objects mediate the ecological signals they're part of, and come to life to communicate with their owners.

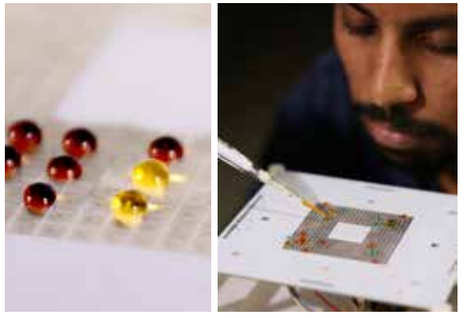
The objects were created in collaboration with artists from the Object Prosthetics workshop at the Microsoft Garage Art Factory. This work has been supported by Stochastic Labs and the MIT Media Lab. Early research was conducted in collaboration with Emma Vargo, Serena Pan, and Yasuaki Kakehi. Additionally, we'd like to thank our past research advisors David Kong, Neri Oxman, Pia Sorensen; and our friends Ivan Syseov, Jake Bernstein, Laia Mogas-Soldevila, Dhruv Jain, and Judith Amores, for the feedback they've provided throughout the research process.



Udayan Umapathi (IN/US)

Programmable Droplets

Water is the medium that carries chemical and biological information. It is fundamental for the survival and evolution of life. From walking in the rain to working in a laboratory — water is ever present. It is also safe for humans to touch and consume. Our goal is to use this natural medium, to represent data through calm, ubiquitous computing interfaces that leverage the user's intuitive knowledge of the world. Hence, we have created the *Programmable Droplets* system that can use droplets in our environment and program them for information manipulation and human interaction. To illustrate how droplets in our living environment can become interactive, we have created a device that can be integrated into various everyday objects, to function as information display, to help make art, enable play and display messages. The *Programmable Droplets* system utilizes the technique of "electrowetting on dielectric" (EWOD).



This technique enables a set of primitive operations, such as precisely translating, morphing, merging, and splitting multiple droplets simultaneously. While these techniques have been previously applied to biological automation by other researchers and our own group, we have now started applying these techniques to create water-based computer interfaces.

Hannes Möseneder (AT), Agnes Hofstätter (AT), Steffanie Painsith (AT), María José Molina (CO)

Polytronics

A smart symbiosis of polymers and electronics

The last decades have seen an increased momentum and buzz around the idea of a connected world.
The evolution of technologies such as the Internet of Things, in which objects are embedded with electronic systems in a sophisticated network that enables the collection and exchange of data, is disrupting the way we live.
Greiner, as a leading global manufacturer of plastic products for a wide range of industries, explores the application of those new technologies. This exhibition presents a sample of 5 different mockups: products manufactured by Greiner which, in combination with electronic components, have the potential to sense and act

according to inputs gathered from their environment. These new features allow communication between products, systems and devices, providing an enhanced user experience that goes beyond the materiality of the product itself.

Greiner Technology & Innovation (GTI)

IMMERSIFY

Immersify — cutting edge tools for the next generation of immersive media

Immersify is a European research project that started in October 2017, connecting the Ars Electronica Futurelab with four partners from all over Europe (Poznan Supercomputing and Networking Center, Spin Digital Video Technologies GmbH, Marché du Film — Festival de Cannes and Visualization Center C).
In order to create media that is as immersive as possible, the expertise of the partners is diverse and includes video codecs, infrastructure, film distribution and high resolution displays. The project, situated right at the intersection of artistic vision, scientific research and technological development, is set to continue until 2020. During this year's festival, the ongoing progress of Immersify is presented in a series of demos developed by artists like Tadej Droljc who premieres *Singing Sand 2.0* and BBC's *The Great Pyramid in 3D* from the series Ancient Invisible Cities. Also taking place at Deep Space 8K, is a 8K live streaming demo that stretches the limits of what is technologically possible today. Lastly, PSNC is presenting an ambisonic audio installation at the main festival location, POSTCITY, that offers a glimpse into their experiments with 3D-audio in a binaural domain.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 762079.

Singing Sand 2.0, Tadej Droljc at Deep Space 8K, Photo: Robert Bauernhansl

Wojciech Raszewski (PL), Jan Skorupa (PL), Eryk Skotarczak (PL), Leszek Nowak (PL)

Immersive Ambisonic Audio

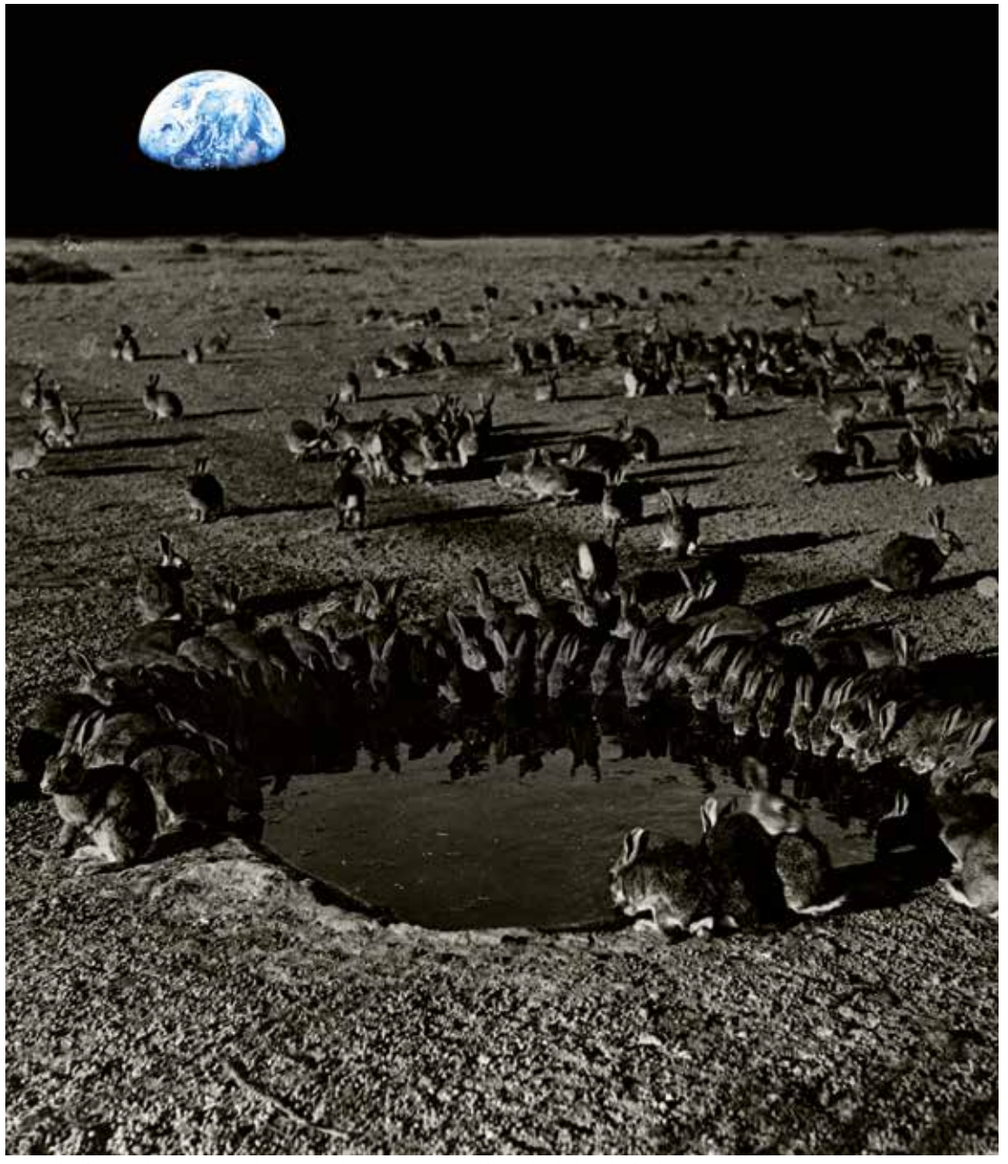
Immersive Ambisonic Audio is a space built for development in the area of immersive sound. The project began with experimental recordings of the jazz band *Anomalia* made at PSNC in the New Media Laboratory. All sessions were registered using ambisonic microphones, 8K and 360° cameras. The demo is a combination of 3D ambisonic audio and VR reality, which gives participants a unique experience.
The installation is built of 24 independent loudspeakers, which come together to create a sphere. Visitors have the opportunity to stand in the center of the area, wear VR goggles and take part in two different music sessions. The first session is a modern jazz song played by a septet called *Anomalia*. The second piece is a contemporary music composition for live electronics, Tibetan bowls, and a string quintet composed by Jan Skorupa.

Immersify/ PSNC: Maciej Głowiak, Wojtek Raszewski, Jan Skorupa, Eryk Skotarczak, Leszek Nowak; Anomalia: Kacper Krupa — Tenor Saxophone, Krzystof Kuśmierek — Soprano Saxophone, Patryk Rynkiewicz — Trumpet, Adam Kurek — Trombone, Fryderyk Szulgit — Guitar, Stanisław Aleksandrowicz — Percussion, Piotr Cienkowski — Double bass; String quintet: Kasia Stróżyk — Violin, Zuzanna Remiorz — Violin, Julia Polowczyk — Viola, Wiktoria Różycka — Cello, Filip Szymański — Double Bass, Marta Kaca — Conductor; Immersify project partners: Poznan Supercomputing and Networking Center, Spin Digital Video Technologies GmbH, Ars Electronica Futurelab, Marché du Film — Festival de Cannes, Visualization Center C

Pawel Rybarczyk

Pawel Rybarczyk

SpaceEU



A Touch Of Home © WE COLONISED THE MOON, Hagen Betzwieser (DE), Sue Corke (UK)

ABOUT spaceEU

spaceEU is an exciting space outreach and education project which aims to spark the interest of young people in STEAM (Science Technology Engineering Arts and Math), and to encourage them to consider space-related careers. The project inspires and broadens young minds, develops a sense of European and global citizenship, and through our shared human relationship with space, aims to foster long-term partnerships between people from different cultural backgrounds and countries.

space-eu.org

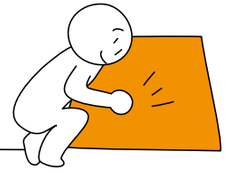
At this year's Ars Electronica Festival, you will be able to see the interactive *spaceEU* exhibition as well as corresponding events and workshops. The same exhibition will be shown in 10 different countries from December 2019 to October 2020. Find out more about events, collaborators, and the European connection on the website.
ars.electronica.art/spaceeu

Exhibition Artists: Sarah Petkus (US), WE COLONISED THE MOON (DE/ UK), Nuotama Bodomo (GH/US), Eva Rust (CH)
Exhibition Partners: Sentinel-hub EO-Browser, ESA Apps,
Exhibition Co-design Manager: Laura Welzenbach
Architecture: Gerald Moser/ Wunderkammer and Zirup — Architektur & Design
Storyline/ Writer: Niamh Shaw
German Translation: Theresa Apweiler
Graphic Designer: Rory McCormick
Tech Advisor: Bildwerk
SpaceEU principal investigator and coordinator: Pedro Russo
With contributions from: Suzana Filipecki Martins, Ryan Williamson, Grace Darcy, João Dias, Cristina Paca and Veronika Liebl
The exhibition was developed by Ars Electronica in close collaboration with Science Gallery Dublin and Leiden University.
spaceEU partners: Leiden University, Ars Electronica, Ecsite European Network for Science Centres & Museums, EUN Partnership AISBL European Schoolnet, Science Gallery at Trinity College Dublin, Ellinogermaniki Agogi , Ciência Viva, Cité de l'espace, Parque de las Ciencias, Universum® Bremen, SCIENCE IN, New Space Foundation
spaceEU project has received funding from the European Union´s Horizon 2020 Framework Program for Research and Innovation under grant agreement No. 821832

EARTH SEEN FROM SPACE © Hagen Betzwieser

Chimponauts and Astrocats © Eva Rust (CH)

SySTEM 2020



SySTEM 2020 Round1 @ Ars Electronica Center 2019 © Martin Hieslmair

SySTEM 2020 is an EU research project lead by Science Gallery at Trinity College Dublin. It tackles scientific literacy and STEM education of children and teenagers. It will support our future citizens in a world of fast-evolving science and technology. *SySTEM 2020* focuses on science learning outside the classroom and mapping the field across Europe. We evaluate a number of transdisciplinary programs to design best principles for educators and examine individual learning ecologies by piloting self-evaluation tools. This study will also map practices in 19 EU countries, including in-depth studies in 8 of these countries. The input of 9 — 20-year-old learners from various backgrounds, including those from geographically remote, socio-economically disadvantaged, minority and/or migrant communities, will be a core part of the project.
Within three years several workshops will take place at the Ars Electronica Center and the Ars Electronica Festival to explore the learning of 9 — 20-year-olds outside schools and universities. At this year's festival, you will find SySTEM 2020 collaborating with CREATE YOUR WORLD, the festival within the festival. Check out the following CREATE YOUR WORLD events and be part of *SySTEM 2020*:

Human Cyborgs
one shot
SIA Social Intelligence Agency
Camera 4D Jugendbegegnungsprojekt
Campus at Ars Electronica Festival

Find out more about the SySTEM 2020 and the events at Ars Electronica Festival online:
system2020.education/get-involved
ars.electronica.art/system2020/
ars.electronica.art/u19/
SySTEM 2020 Partners: Science Gallery at Trinity College Dublin, Ars Electronica, Waag Technology & Society, Aalto University, Ecsite European Network for Science Centres & Museums, Bloomfield Science Museum, Kersnikova, Centre for Promotion of Science, Museo Nazionale Scienza e Tecnologia Leonardo da Vinci, Parque de las Ciencias, NOESIS, Technopolis, Science Gallery London, TRACES, Raumschiff, EMBL European Molecular Biology Laboratory, Tom Tits Experiment, MUSEIKO, Fundação da Juventude, ZSI, LATRA
This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 788317

Photos: Martin Hieslmair

DIGITAL THEATRE

Fragments |a digital Freischütz, CyberRäuber (DE)

European Theatre Convention

Theatre in the Digital Age

The digital shift changes how we create, share and monetize content, including theatrical works. Where does contemporary theatre fit into our digital world? And what conditions must be met for digital innovation in theatre? The European Theatre Convention (ETC) has set Theatre in the Digital Age as a core pillar of its program for European Theatres. Through research and experimentation with digital technologies, ETC aims to enhance theatrical live experience and to offer meaningful reflection of its possibilities and boundaries. This year for the third time, Ars Electronica and ETC collaborate in a symposium with discussion, a hands-on VR workshop by the CyberRäuber and their *Fragments | a digital Freischütz*, a virtual reality opera in four episodes, co-produced by ETC members Landestheater Linz and Badisches Staatstheater Karlsruhe.

Founded in 1988, ETC has become Europe's largest network for public theatres with around 40 venues from more than 20 countries. As an artistic platform for creation, innovation and collaboration, ETC initiated the project *European Theatre Lab — Drama goes digital* in 2016.

The ETC project *ENGAGE: Empowering today's audience through challenging theatre* is co-funded by the Creative Europe Program of the European Union.

CyberRäuber (DE)

Fragments | a digital Freischütz

Opera up close, eye to eye with the main characters: Max must prove himself with a masterly shot to gain the hand of Agathe, the head forester's daughter, and so become his successor. Doubting his skills as a marksman, Max accepts the help of Kaspar, who sold his soul to the devil, to cast seven magic bullets: six of them hit anything the shooter wants, the last one will be directed by the devil...

In the VR installation, the audience encounters the protagonists closer than has ever been possible in a real theatre — and in surreal spaces: Max in a mountain where the rocks look like him, his beloved Agathe in a two-tiered forest, her best friend Ännchen in a maze, and evil counterpart Kaspar in a tunnel of thorns in outer space. The four distinct episodes show fragments of a classical masterpiece, following no linearity or chronology, inviting us explore, to stroll, observe and even influence the experience.

Fragments is a co-production with Badisches Staatstheater Karlsruhe and Landestheater Linz, funded by Kulturstiftung des Bundes (German federal cultural foundation). Composer Micha Kaplan provided additional scores influenced by the original material.

Concept, direction, realization: CyberRäuber (Marcel Karnapke, Björn Lengers)
Composition, sound design: Micha Kaplan
Dramaturgy: Deborah Maier
Production: Eva-Karen Tittmann
Max: Matthias Wohlbrecht
Agathe: Ks. Ina Schlingensiepen
Kaspar: Ks. Konstantin Gorny
Ännchen: Agnieszka Tomaszewska
Brautjungfer: Camelia Tarlea
Musical direction (recordings): Johannes Willig
Chorus direction (recordings): Ulrich Wagner
Badische Staatskapelle
Badischer Staatsopernchor

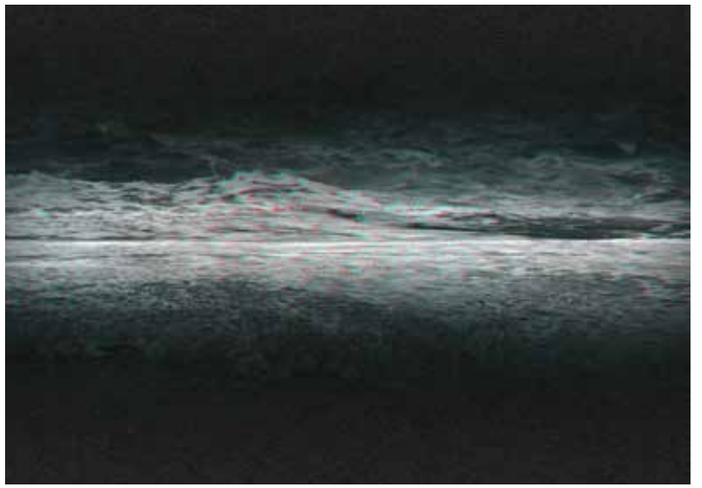
Fragments |a digital Freischütz, CyberRäuber (DE)

DEEP SPACE 8K

The Ars Electronica Center offers its visitors something that can not be found anywhere else in the world: 16 x 9 meters of wall and another 16 x 9 meters of floor projection, laser tracking and 3D-animations make the Deep Space 8K something very special indeed. Furthermore, Deep Space 8K presents challenging infrastructure to media artists.

As they go about adapting existing works and, above all, designing installations custom-made for this space, they're entering artistic terra incognita.
The position of visitors amidst the projection surface and participation by them call for a well-thought-out aesthetic composition and concepts for the resulting dynamics.

Deep Space 8K — Ars Electronica Center, © Ars Electronica / Christopher Sonnleitner



Ulf Langheinrich (DE)

NOLANDX

Installation, 2019

NOLANDX is an audiovisual composition. Patterns synchronized in sound and image are organized along a cyclic basic structure. The image planes are the aesthetic nucleus of the work, along with algorithmically generated noise and lines as well as recordings of ocean waves. This referential source material is significantly transformed by slit-scan and other interventions on the time level — all time sequences are shifted. Everything is in a state of increasing transformation. The image and image-flow manipulations are like steep filters, not independent of the material fed into the filter, but significantly transforming it. The pictorial space appears gelatinous, sometimes crumbly, diffusely hyper-sharp, a pulsating, stereoscopically black-and-white space, glassy, dark. Qualities such as elasticity, viscosity, depth and temperature describe this space.

Audiovisual composition: Ulf Langheinrich (DE);
Time-gradient software: Nicolaus Völzow (DE);
Research software environment: Matthias Härtig (DE);
Research hardware environment: Dirk Langheinrich (DE);
Production: EPIDEMIC (Richard Castelli, Chara Skiadelli, Florence Berthaud) (FR), ART VAN BORS (NL), ARS ELECTRONICA (AT); Supported by Landeshauptstadt Dresden, Amt für Kultur und Denkmalschutz (DE), Gemeente Waadhoeke (NL); Thanks to Lucie and Herman Homan, Gunter Neumann, Jip and Wies Noest, Gelske and Ytzen van de Werff, Martin ter Schure

Sonar Flux is part of the AIxMusic Festival Program

Kaoru Tashiro (JP), Ouchhh (TR)

Sonar Flux

A Real-Time Generative Installation Piano Performance

PIANO SOLO WORKS

1. dreamSequences — Lukas Neudinger (9-10min)
2. Comme l'harmonie du soir — Kenji Sakai (2min)
3. A flower's dream — Claude Ledoux (3min)
4. Saveurs de Ciel — Claude Ledoux (9min)
5. Blue in Green / Green in Blue — Kenji Sakai (11min)

"Innovativeness" is Kaoru Tashiro´s approach to her performances. Besides her classical recitals in various cities in Europe, she has been invited to perform at the festival of contemporary music «Ars Musica» in 2012 and in 2016 in Brussels. Kaoru has been the dedicatee of the piano Etude "Comme l'harmonie du soir" by the Rome Prize winner, Kenji Sakai, which she will perform amongst other pieces in Deep Space 8K.
The piece "Blue in Green / Green in Blue" by Kenji Sakai is written for the victims of the Tsunami in Fukushima several years ago, when the composer heard the responses of local children to an inquiry asking: "What do you miss most?". One reply was: "I miss the blue sea and the green field".
The visual performance of Ouchhh reacts according to the sound and reflects qualities such as focus and attention or emotions, among other things. What if matter is nothing but notes coming out of a vibrating string? According to superstring theory, all matter in the world is made up of one thing: vibrating thin strings. These strings, which vibrate at different resonances, bring everything into existence in the known universe. Matter consists of small strings. When these strings are pulled in a certain way — just like a violin or guitar string — they create a frequency. Therefore, the pitches/notes occur. We have become aware of the existence of the little notes that these superstrings create, and we realize that the universe is a symphony, and all the physical laws of the universe fit these superstrings. Ouchhh takes inspiration from the notes that exist in the universe while microstrings vibrate (Subatomic Particles) in real time and define the melodies created by the notes as "Matter" and symphonies of these melodies as "Universe."

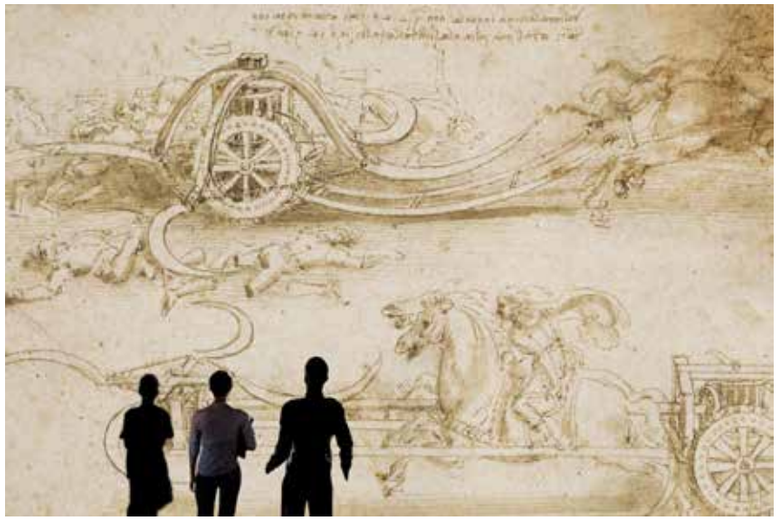
Virgil Widrich (AT), Martin Reinhart (AT)

tx-reverse 360°

A space time cut through cinema

What is behind the cinema screen? What if the forces of unlimited imagination penetrate through the canvas into our reality? What if the auditorium dissolves and with it the familiar laws of cinema itself? In a way never seen before, *tx-reverse* shows this collision of reality and cinema and draws its viewers into a vortex in which the familiar order of space and time seems to be suspended. Back in the 1990s, Martin Reinhart invented a film technique called "tx-transform," which exchanges the time (t) and space axis (x) in a film. 20 years after Martin Reinhart and Virgil Widrich used this film technique for the first time in a short film (*tx-transform*, 1998), they deal once again with the question of what previously unseen world arises when space and time are interchanged, and in just the right setting: a cinema at full 360°. At the Babylon Kino in Berlin, they filmed about 135 actors with the OmniCam-360 and calculated the installation *tx-reverse 360* for the ZKM from this material.

Concept and direction: Martin Reinhart, Virgil Widrich; music and sound design: Siegfried Friedrich; Omni-Cam-360: Jana Pape, Danny Tatzelt, Christian Weissig; tx-transform technology: Martin Reinhart; DOP: Martin Putz; production assistants: Elias Wolf, Moritz Woll; sound: Bastian Orthmann; set photos: Alexander Grenniglo; programming: Matthias Strohmaier; post production consulting: Leonard Coster; post production: Bernhard Schlick; retouching: Patryk Senwicki, Dominic Spitaler, Peter Várnai; cinema technology: Bernd Rohde; cinema organ: Anna Vavilkina; violin: Serkan Gürkan; violoncello: Konstantin Zelenin; singing, voice: Marlene Umlauft; voices: Ira Prodeus, Oleg Prodeus; sound mix: Georg Tomandl/Sunshine Mastering; VR Spatial Audio Mix: Thomas Aichinger, scopeaudio; VR post production: Axel Dietrich, vrisch; thanks to: Roberta Bianchini, Judith Bihr, Eva Dertschei, Christian Dürckheim-Ketelhodt, Timothy Grossman, Susanna Kraus — IMAGO, Ingrid Truxa, Peter Weibel; shot at Babylon Berlin; production: Virgil Widrich Film- und Multimediaproduktions G.m.b.H.;© 2019, Distributor: Sixpack Film (short film), Lemonade Films (VR version), supported by Federal Chancellery Departement for the Arts (AT), City of Vienna (AT), Duerckheim Collection (DE), Produced in cooperation with the ZKM | Center for Art and Media Karlsruhe (DE), *www.widrichfilm.com*



Leonardo da Vinci, Studi di carri d'assalto muniti di falci, c. 1485 (penna e inchiostro bruno acquerellato con tracce di punta metallica su carta). ©MiBAC — Musei Reali — Biblioteca Reale, Torino; Photo by Ernani Orcorte

Franz Fischnaller (IT)

LSF-500 — Project

LEONARDO: SHAPING THE FUTURE ... 500 Years of vision

Immersive digital exhibit, showcasing Gigapixel images in 8K, up to 28350x40160 pixels, made of over fourteen of Leonardo da Vinci's works comprising among others: the universally renowned *Portrait of an Old Man* (also known as the Self Portrait of Leonardo), the *Head of a Young Woman* (Study for the Angel in the Virgin of the Rocks), often described as the "Mona Lisa of drawings," the notable manuscript, *Codex on the Flight of Birds* (18 pages with studies and 167 drawings), donated by Theodor Sabachnikov to King Humbert I in 1893, containing Leonardo's drawings of flying machines, including the ornithopter, a flying machine with flapping wings, and the *Hidden Portrait*, Leonardo da Vinci's alleged self-portrait discovered under one of the pages of the *Codex on the Flight of Birds*.
Through the *LSF-500 Project*, the audience experience an immersive journey through Leonardo's prodigious polymathic research and visions in art, science and engineering.

Curator+ Concept: Franz Fischnaller; Project Partners and collaborators: Ministero dei beni e delle attività culturali, Istituto Centrale per il Restauro e la Conservazione del Patrimonio Archivistico e Librario (ICRCPAL), Rome, Italy; Director: Dr. Maria Letizia Sebastiani; high-resolution photographs (Gigapixel) of Leonardo's works presented through LSF-500 Project in Deep Space 8K during the Ars Electronica Festival 2019 (AEC),are courtesy of ICRCPAL. Photo credits: © Alfredo Corrao — IRCPAL/ MiBAC, *www.fotobeniculturali.com* and T.E.A.; "PROGETTO OPERE DI LEONARDO" of the Istituto Centrale Per Il Restauro e la Conservazione del Patrimonio Archivistico e Librario; Musei Reali Torino, Torino, Italy; Director: Dr. Enrica Pagella; the Photographs (3000x2000 and 300 dpi) of Leonardo's works + Renderings and image simulations delivered for press release and website of Ars Electronica Festival 2019, are courtesy of of MiBAC — Musei Reali — Biblioteca Reale, Torino. Photo credits: ©copyright of MiBAC — Musei Reali — Biblioteca Reale, Torino, Italia. Photo by Ernani Orcorte. The 14 Leonardo's original works showcased in the LSF-500 Project are ©copyright of MiBAC — Musei Reali — Biblioteca Reale, Torino.The collection, preserved in the Royal Library, rarely shown to the public, consist of thirteen works purchased by King Charles Albert in 1840, dating from the period between 1488 to 1515 and the manuscript, Codex on the Flight of Birds, donated by Theodor Sabachnikov to King Humbert I in 1893.

Franz Fischnaller (IT)

LSI Project

THE LAST SUPPER INTERACTIVE — Art and Mathematics in the Renaissance

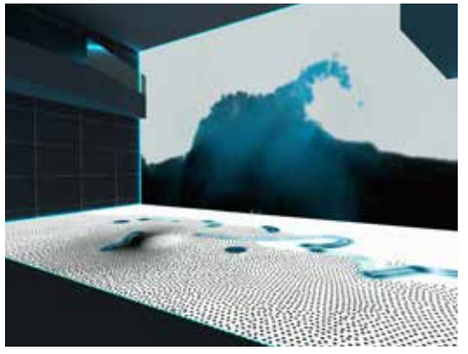
LSI is an immersive experimental digital narrative and virtual storytelling in 8K, based on *The Last Supper* (Italian: *L'Ultima Cena*), a late 15th century mural painting by Leonardo da Vinci located in the refectory of the Convent of Santa Maria delle Grazie in Milan.
Articulated in eight scenes, *LSI* enables the audience to visit the painting from multiple viewpoints and perspectives and explore its details in high-resolution. Alberti's Theorem Virtual Tool (ATVT), an augmented virtual immersive interactive learning device, was designed ad hoc for *LSI* to gain a better understanding of how the linear perspective was used and applied by Leonardo in the painting.
Likewise, visitors can penetrate the dimensional layer of the fresco and be virtually transferred "inside." *LSI* not only draws the visitors "into" the Last Supper scene, but also into the historical context where Leonardo created his masterpiece. Visitors can "travel" through immersive point cloud visualizations combined with the 3D simulation of the architectural complex of the Dominican monastery of Santa Maria delle Grazie where Leonardo painted *The Last Supper* between 1494 and 1498.
Laser scanning (in/out) of the architectural complex of the Dominican monastery of Santa Maria delle Grazie — never done before — was carried out by the Department of Mechanics of the Polytechnic of Milan for the LSI project.

Author: Franz Fischnaller; Project Parters and Teams: INSA Rennes, Institut National des sciences appliquées de Rennes, France, Université de Rennes 1, 35000 Rennes, France, INRIA, institut national de recherche en sciences du numérique, France, IRISA, Institut de Recherche en Informatique et Systèmes Aléatoire, UMR CNRS 6074, France, Prof. Valérie Gouranton, Univ Rennes, INSA Rennes, Inria, CNRS, IRISA, Dr. Ronan Gaugne, Univ Rennes, Inria, CNRS, IRISA, Mathieu Godineau, Univ Rennes, ESIR, Inria, CNRS, IRISA, CINECA — Cineca InterUniversity Consortium, 40033 Bologna, Italy, High Performance Computing Department- SuperComputing Applications and Innovation; Antonella Guidazzoli: Head of Visual Information Laboratory Visit Lab; Silvano Imboden: MD in Computer Science and technical pipeline supervisor; Daniele De Luca: Virtual Heritage CG Generalist and 3D Artist; Politecnico di Milano 20158 MILANO, Italy (Polytechnic University of Milan) Department of Mechanics Computer Vision and Reverse Engineering Lab. — Prof. Gabriele Guidi Laura Micoli, PhD, Umair Shafqat Malik; HALTADEFINIZIONE® is a brand of Franco Cosimo Panini Editore S.p.A.
41124 Modena, Modena, Italy; the ultra-high definition image of the Last Supper supplied by Haltadefinizione, leading company in photographic acquisition of works of art in Gigapixel and 3D. LSI project research and part of the development is based on the highest-ever definition photograph of Leonardo's Last Supper (16 billion pixels), that's 1,600 times larger than images taken with a 10-megapixel camera. A high-resolution scan by HALTADEFINIZIONE in collaboration with the Italian ministry of culture. Bingqing Dong, Visual Artist.

Roman Divotkey (AT), Nora Loimayr (AT), Christoph Schaufler (AT),
Wolfram Weingartner (AT)

Liquidus

Liquidus is an interactive, physics-based fluid simulation that turns Deep Space 8K into a playful laboratory to explore various properties of liquids and gases. From familiar substances such as water under normal Earth conditions, to seas of liquid methane on Saturn's moon Titan, or even melted gummy bears in zero gravity, *Liquidus* provides an environment to collectively explore fluids in context. Data for the physics calculations are processed and visualized in real time and are also utilized to create a soundscape that supports the overall visual experience.



Quantum Reboot

Andrea Aschauer (AT), Jeremiah Diephuis (US), Juergen Hagler (AT),
Wolfgang Hochleitner (AT), Georgi Kostov (BG), Gabriel Mittermair (AT)

Deep Quiz

Deep Quiz transforms the Ars Electronica Center's Deep Space 8K into an interactive TV-like game show. Audience members can simply step onto the stage and compete against each other in a test of knowledge, featuring content from 40 years of the Ars Electronica Festival.
In addition to standard multiple-choice questions, there are also dynamic quiz activities such as collecting relevant virtual objects. The application combines physical exercise, group dynamics, and learning as an exciting, playful assessment performance that entertains the audience with one central question: just how much do you know?

Playful Interactive Environments

Monica Vlad (RO) with guest Johanna Falkinger (AT)

Che si può fare?

AV live performance, opera, noise music

When noise music and classical opera meet: Monica Vlad is an experimental audio/visual artist who creates a noise composition based on opera using a live soprano voice interpreted by Johanna Falkinger. The structure is based on three different arias sung by her although these arias were not originally composed for this opera. Similar to the system of an Aria di Baule — a so-called suitcase or insertion aria — the singer is choosing the arias to be sung. In addition, the sound artist Monica Vlad changes the orchestral accompaniment to electronic noise and the classical instruments are replaced by analog machines. The arias, however, are interpreted by the soprano as original.
The theme of this performance is based on feelings of melancholy, sadness, fear of loss, meditation and anger and how music can be used to express and release these emotions.

Monica Vlad and Johanna Falkinger, 2019
http://monicavlad.com/

Suyang Kim (KR), Dieter Stemmer (AT), Marlene Reischl (AT), Christian Philip Berger (AT)

Eruptions

Emotional outbursts and eruptive climaxes dominate this program both musically and visually. A stormy half hour is to be expected, as a whirlwind of large-scale projections and emotionally intense music whizzes through the Deep Space 8K of the Ars Electronica Center.

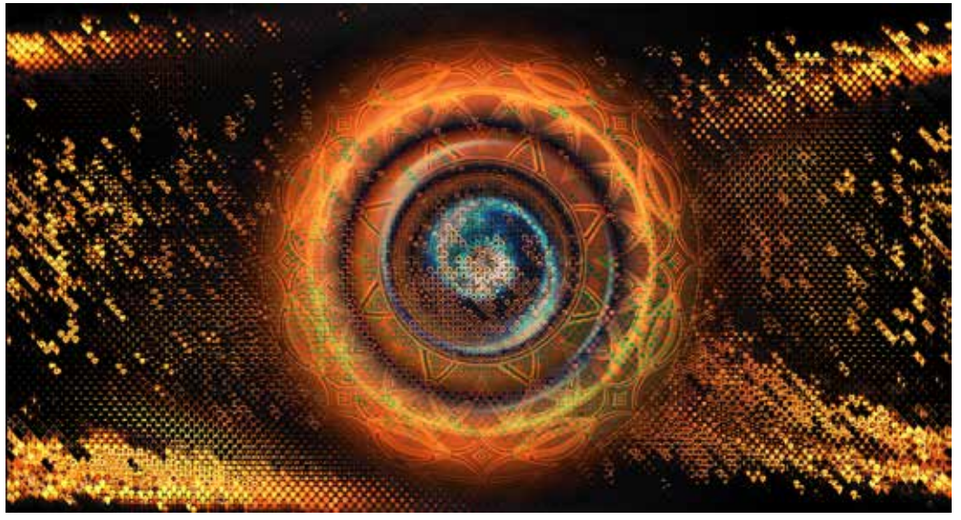
Andreas Röbl

Suyang Kim, Dieter Stemmer

MUSIC PROGRAM:

Béla Bartók: *With Drums and Pipes* from *Out of Doors*
Fazil Say: *Night*
Christoph Willibald Glück: *Dance of the Blessed Spirits* from *Orpheus and Eurydice*
Franz Schubert: *Elf King*
Astor Piazzolla: *Oblivion*
Astor Piazzolla: *Libertango*
Aram Khachaturian: *Sabre Dance*

Music: Suyang Kim (KR), Dieter Stemmer (AT) — piano
Visuals: Marlene Reischl (AT), Christian Philip Berger (AT)



Quantum Logos by Mark Chavez

Mark Chavez (US), Ina Conradi (SG), Tate Chavez (US),
Bianka Hofmann (DE), Bob Kastner (AU)

Quantum Logos

Quantum Logos is an immersive, reactive audio-visual experience that explores the basics of quantum theory as expressed through cultural archetypes. Using state of the art, real-time animation techniques, we attempt to shed new insights on fundamental natural phenomena, affirming questions that scientific observations compel concerning the nature of existence.
The media artist duo Mark Chavez and Ina Conradi teamed up with sci-art producer and developer Bianka Hofmann and science communicator Bob Kastner to form the art-sci collective Quantum Travelers.
The collective aims to use cultural metaphors to artistically describe ambitious and crucial scientific concepts, with an emphasis on describing scientific insights in Quantum theory.

Valentina Cinquini (IT), Andrea Ummarino (IT), Federico Perinelli (IT),
Raphael Schuster (AT), derkleinstePrinz (ES)

384

MUSIC AND VISUAL IN REAL CREATIONAL FLOW EXPERIENCE

384 is a project that combines live music with interactive visual projections. The group is composed of four musicians and a visual artist. In every performance, the interaction is always new, with a different visual artist, who brings their own artistic expression. The concept is built upon extemporization, using live improvisation — both musical and graphical. What you hear is a complete improvised performance in real time, based on the idea of no boundaries, building up the music together, listening and answering one another. What you see is being virtually created and controlled by the visual artist, who is improvising too, interacting with the music.
Nobody, not even the artists, can tell what is going to happen. Every performance is unique and unrepeatable. A tribute to being part of a unique creative artistic experience.

Andrea Ummarino: electric guitar
Federico Perinelli: electric bass
Raphael Schuster: drum kit and electronic pad
Valentina Cinquini: electric celtic harp
derkleinstePrinz: visual artist

Christian Motz

OMAi GmbH (AT)

Markus Dorninger (AT), Matthias Fritz (AT)

Tagtool im Deep Space

For more than ten years, house facades and stage sets all over the world have been illuminated with spontaneous pictures that are painted and animated live. Responsible for this are members of the Tagtool community, united by an alternative vision of digital art. They work on the street or in the theatre instead of in front of the screen, jam like jazz musicians, and search for new forms of visual expression. During the Ars Electronica Festival 2019, an interactive production by selected artists will be presented at Deep Space 8K. The installation is the result of a recent residency of Tagtool artists from around the world. Together, they will create an impressive work of art specifically for Deep Space, with many details and everything in motion. The audience can also take part in the design on site.

OMAi GmbH (AT)

Julian Pixel Schmiederer (AT), Gregor Franz (AT), Johannes Rass (AT), Lara Rabitsch (AT)

PRESSURE

Experimental Film

Pressure is an underwater experimental film project, developed, produced and realized by an ambitious team of very young filmmakers from Ortweinschule Graz.
Between the pulsating city and the stagnation of the people, a young man is looking for his place in society. *Pressure* shows his journey from the drug-ridden nightlife to the exploitative music scene. Everywhere his search takes him, he faces restrictions, compulsions and pressure. His journey ends when he starts questioning everything he fought for while hitting rock bottom.
To show all this, we chose to let the action take place underwater so that the main character is literally floating through the environment. The story is told by a poem-like monolog and the emotions are expressed through the body language of the protagonist.

Written and directed by: Julian Pixel Schmiederer; Director of photography: Gregor Franz; Produced by: Julian Pixel Schmiederer, Lara Rabitsch; Edited by: Johannes Rass; Unit production manager: Ines Handler; 1st Assistant director: Sarah Steinhäusler; Underwater assistant director: Felizitas Wasner; 1st Assistant camera: Johannes Rass; Grip, lighting: Max Kollreider, Eliam Laupert; Set dressing: Darius Petrovic; Safety diver: Ben Jancsy; Supported by: Stadt Linz, Pädagogische Hochschule der Diözese Linz, High Pressure Group, Ars Electronica, ATG Graz, Banana Rental, Peter Dopplinger Filmgeräteverleih, Ton & Bild Medientechnik GmbH, Stöger Kameras Gmbh, Viteka & Lorenz OG

VH AWARD

The *VH AWARD's* purpose is to uncover promising but relatively unknown Korean artists creating media art. It seeks to support the art-making process of these young, talented media artists but to also help them gain international recognition. To guarantee a fair evaluation, all award winners will be selected by highly celebrated curators from both Korea and other parts of the world. This will also facilitate the creation of fruitful, global connections between potential award winners and well-known curators.

In addition, the *VH AWARD* will introduce a new genre of media art to the public. This new genre centers on innovative ways of communicating information, which ultimately promote a more tightly knit field of art.
In order to showcase Korean media art in an optimal manner conducive to garnering global attention, the finalists will have the opportunity to display their works of art through the spectacular media-wall, located at the Hyundai Motor Group University — Mabuk Campus.

Youngkak Cho (KR)

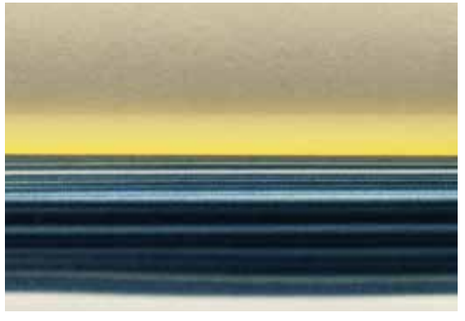
Highway like A Shooting Star

Highway like a Shooting Star explores the idea of roads as witnesses to civilizations, and the most innate of human systems. The artist presented an AI machine-learning algorithm with diverse depictions of roads, which in turn created a work completed through intervention of the other, without a human emotive presence. By hypothesizing the process and outcome where machines or technological systems become leading bodies in a future society, the artist beckons visitors to consider what roles and significance human beings will embody in this not-so-distant future.

Dongjoo Seo (KR)

A Thousand Horizons

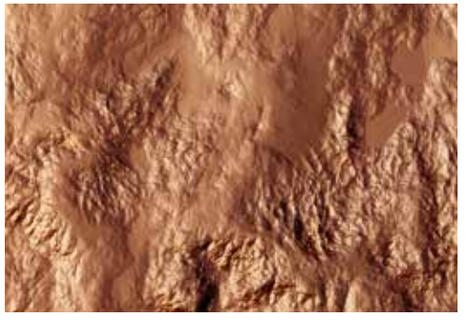
A Thousand Horizons combines CG and the repetitive page-turning of a book, captured through an unfamiliar perspective. Through the constantly expanding and changing horizontal landscape of the symbolic time of "day," it explores the digital and analog media's temporal, spatial, and material properties, metaphorizing human reason, action, and interaction. It poses questions about the being between macro — micro, external — internal, conceptual — abstract, real — fantasy, nature — artificial, body — mind, captivating visitors into a synesthetic experience.



최찬숙 Chansook Choi (KR)

BLACK AIR

Black Air deals with the human dichotomy in engaging with the land that we occupy, and the critical responses to it. The human need for development, driven by modern rationalism, creates an austere dichotomy with rigid boundaries and stratification to everything. The others in that dichotomy are unable to own land, and become border-crossing nomadic beings. Through such an approach, the artwork redefines the earth as a subject of connected empathy, as well as the founding platform of humanity, and not so much an object of possession.



Poznan Supercomputing and Networking Center (PL), Spin Digital Video Technologies GmbH (DE), Ars Electronica Futurelab (AT), Marché du Film — Festival de Cannes (FR), Visualization Center C (SE)

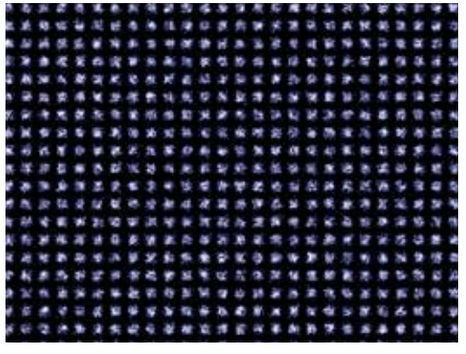
Immersify

Immersify is a European Research & Development consortium funded by the EU's Horizon 2020 program, connecting the Ars Electronica Futurelab with four other European partners to research the next generation of immersive media. At the 2019 Ars Electronica Festival, *Immersify* presents selected works at Deep Space 8K.

PSNC (PL)

Poznan Cathedral 3D

Immersify partner PSNC has scanned the Gothic Cathedral in Poznan with laser technology, using the FARO Focus 3D X330 Scanner, and created a point cloud composed of approximately 2 billion points. Using specially designed software, a number of high-resolution clips were generated, ranging from 8K to beyond 16K. The clips can be shown in 2D or 3D, as well as in partial and full 360-degree panoramas.



Theresa Schubert (DE)

Immersive Minimalism

Immersive Minimalism is an 8K video environment based on a custom Cellular Automata (CA) system. The generative video shows surprisingly complicated behavior that appears when all 33 million pixels on screen act as individual interacting agents within a set network. *Immersive Minimalism* uses CA to investigate modes of perception through creating video scenarios between geometric abstraction and minimalism. The work was created as part of a STARTS residency at PSNC.

ARRI (DE)

Pandarama

ARRI´s *Pandarama* shows a 360° pilot production for the ARRI Omnicam panorama camera system. Exploring the technical possibilities of the recently developed system, the video shows 360° content filmed at the Panda Research base in Chengdu, Huangguoshu Waterfall, and Guizhou.

Timestorm Films (DE)

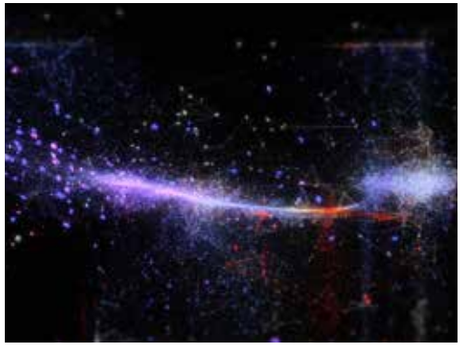
Island in the Sky II

Timestorm Films, known for its use of cutting-edge technology for time lapse videos, will present a state-of-the-art sequel to *Island in the Sky*, showing stunning landscapes of La Palma. Shot in native 8K 60fps, this film tries to showcase future display and video technologies.

Tadej Droljc (SI)

Singing Sand 2.0

Singing Sand 2.0 is the newest iteration of Tadej Droljc's experimentations with abstract stereographic 3D computer graphics, rendered in 8K for the first time. The piece is an immersive, audio-visual experiment in which the movement of particles is sonified in real-time, affecting the color- and soundscape that envelopes the audience.



Immersify 8K Live Streaming Demo

The *Immersify 8K Live Streaming Demo* will premiere a real-time transmission of 8K content in the immersive environment that is Deep Space 8K. The encoder and decoder functionalities that are necessary for such an ambitious streaming demonstration have been developed in the context of the European research project *Immersify*. *Immersify* partner Spin Digital is providing flexible and high-performance software 8K playback on PC platforms with the software player Spin Player, while the Advantech VEGA encoder platform and streaming via public internet complete the setup. Lastly, Deep Space 8K at the Ars Electronica Center provides an impressive media environment for the pioneering demonstration. In collaboration with NHK Technologies, a live stream will be demonstrated from Japan to Linz, and with PSNC, an 8K stream from Poznan in Poland to Deep Space 8K, each with special content.

Tom Mesic

BBC Studios

BBC Studios (UK), ScanLab Projects (UK)

The Great Pyramid in 3D, From the BBC Series Ancient Invisible Cities

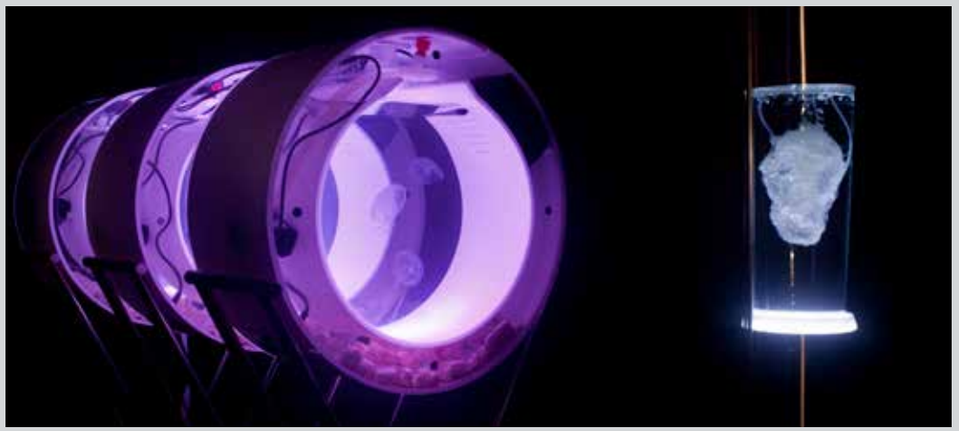
The Great Pyramid in 3D, From the BBC Series Ancient Invisible Cities explores possibilities of virtual archaeology by scanning and digitally rebuilding historical architecture — in this case, the Great Pyramid of Giza. In this unique form of presentation, visitors can choose between different paths to explore the ancient structure, moving interactively in a 3D environment with stereoscopic 360° video at 12K resolution.

The experience is enhanced by a specially created soundtrack and live expert commentary. The contents were adapted for Deep Space 8K by the Ars Electronica Futurelab in the context of *Immersify* by creating a Unity 3D application, allowing users to move interactively in the three-dimensional space and to freely control their field of view. Thus, interactive elements are woven into the storytelling.

ARS ELECTRONICA GALLERY SPACES

Since its successful launch three years ago, the Gallery Spaces Program, deliberately written in the plural, has brought a large number of international galleries and collections with their different positions on digital art to the Ars Electronica Festival. But there is more to it than showing digital art represented by galleries — it is above all about the changing conditions of creating and marketing art under the impact of digitalization. New tools and technologies result in a multiplicity of novel approaches, methods and developments within the arts, which need proper platforms for representation not only with respect to the present.

Hence, discussing and finding strategies to preserve the variety within the art sector for future generations is a key aspect of the Ars Electronica Gallery Spaces.
This is addressed both in the curatorial concept of the exhibition and the discursive program with workshops and talks. Due to its continuous work and experience in the production and presentation of media art and digital art since 1979, as well as the remarkable exhibition areas of POSTCITY, Ars Electronica is the ideal environment for an exchange among collectors, exhibitors, artists and other parties involved or interested in this field.

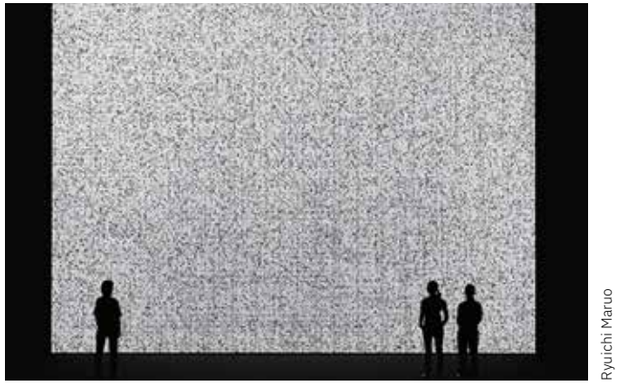


Miha Fras

P3 Aurelia 1+Hz / proto viva generator by Robertina Šebjanič

Courtesy of Cibrian Gallery

Eclipse II, Félicie d'Estienne d'Orves (GR/FR)

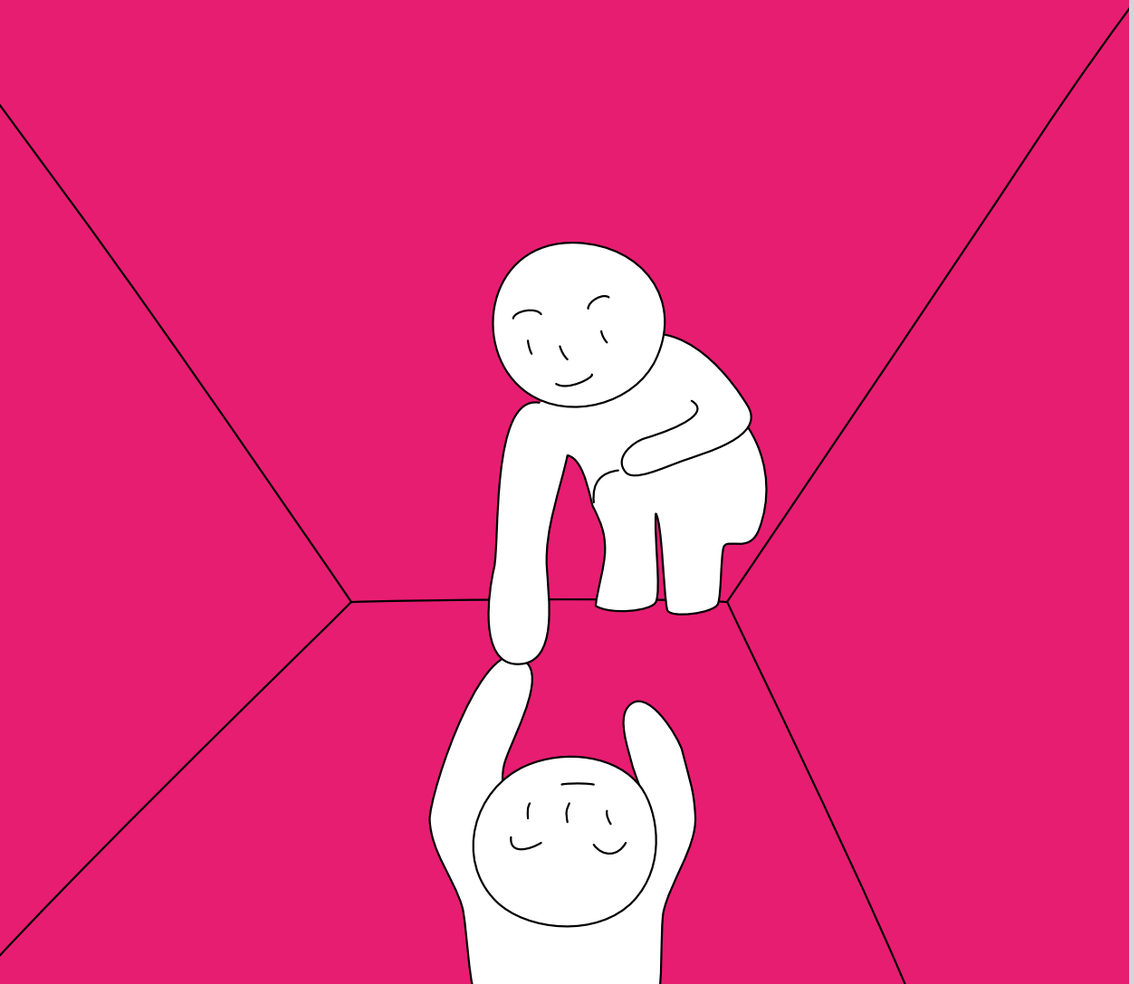


Ryuichi Maruo

data.tron, Ryoji Ikeda (JP)

Estuary Fire Poem still 2, Robert Montgomery (UK)

AIxMUSIC



Gerfried Stocker (AT)

AIxMUSIC

Encounters in the uncharted territories between human creativity and mechanical perfection.

The AIxMusic (AI meets music) Festival is organized by Ars Electronica and the European Commission as part of the STARTS initiative, DG-Connect and many partners from industry, academic research as well as art and education organizations. It is a hybrid a music festival and an AI conference, of a philosophical symposium and a Start-Up presentation.
It engages with art and music to demonstrate and discuss the latest achievements of AI research with respect to their potential impact on our lives.

THE MAIN GOALS OF THIS NEW FESTIVAL PROGRAM ARE:

- bringing together artists, creators, computer scientists, philosophers, industry people, policy makers
- exploring the complex and fascinating relationships of man and machine, culture and technology.
- celebrating human spirit, creativity and ingenuity which finds its expression in arts as well as in science and technology.
- to better understand the upcoming disruptions and forces that will result from new developments and the increasing presence of autonomous digital systems.
- to develop the necessary skills and strategies to stay ahead and in control of the ongoing changes in particular related to new applications of machine learning in many areas of our daily lives.
- to comprehend and strengthen the synergies and potentials of STARTS (Science Technology and Arts) collaborations as a source for discovery and innovation.
- to initiate new ideas and new alliances towards a specifically “European way” for a culture and humanity driven development of AI technologies and applications.

Creativity, the ability to give birth to new and unexpected forms of expression, to go beyond repetition and modification of what already exists, is often seen as an ultimate frontier only possible for the human mind.

- Will machines be able to create compelling works of art or ingenious scientific theories?
- What are the differences between repetition, interpretation, industrial creation and original creation?
- Will we be able and willing to appreciate it in the same way and depth that we appreciate art created by humans?
- How will AI and humans work together? How can AI serve humans best, empower not replace?

Discussing these questions is a powerful approach not only to the cultural and societal implications of AI but to a wider understanding and evaluation of the enticing potentials and possible threats of AI.

The high flying goals and expectations of AI are not only scientific and technological challenges but also cultural ones. Like no other technology before, AI is already causing a lot of controversy and calls for regulation in its very early stages. This comes in a moment where we also see a growing skepticism towards new technology and the immense power of a few industry giants. And it concerns not just some far ahead future of AI, it concerns us right now for the introduction of next generation social media, digital assistants and self-driving cars, smart cities, IoT, digital health care, etc. etc.

Success in the global competition of AI-based services and products will not only depend on technical features and specifications; to a large extend it will also be an issue of trust, confidence, and successful social and cultural implementation.

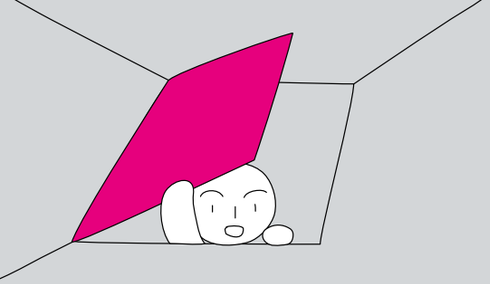
- How and where can we gain the insight and expertise necessary to master these cultural challenges?
- How can we start and conduct the necessary dialog with society?
- How can we ignite inspiration?

Moving into an era where we no longer just use technology as tools but essentially start to live together with it, we need to address these issues. Seducing people with marketing and advertisement won't do the job, we have to go deeper and we have to start now.
That's the crucial point of this new model of collaboration between artists, engineers, industry and society.

WHY MUSIC?

- Music throughout the centuries has always been a forerunner and early adopter of new technologies, has always been a close associate of mathematics and natural sciences. From Pythagoras' Chords, the first wind-driven organ which is attributed to Hero of Alexandria, the music machines from the Islamic Golden Age, to Johannes Kepler's "Harmonices Mundi" (published exactly 400 years ago and developed during Kepler's time in Linz) and further on to 20th-century artists like composer and architect Yanis Xenakis.
- Inventing and building musical instruments has always required the application of new materials as well as the latest improvements in craftsmanship and manufacturing. It was often also a field of fierce battles for patents and commercial licenses.
- New instruments inspired and challenged composers to create in new ways, to rethink music in contemporary and visionary ways, leading innovation beyond their artistic realm. Think of the pianoforte in J.S. Bach's time, or Beethoven who composed for the just-invented Panharmonikon. Then come the Theremin, the Trautonium, the Illiac Suite (the first computer composed music from 1957) , Bob Moog's analog synthesizers or the computer generated sounds and sampling of our days music industry.
- Mathematical and algorithmic principles have always played a big role in music creation - fromm voice-leading in Western counterpoint, to Schönberg's 12-Tone music and computer music.
- The music industry - which went totally digital quite a while ago - is already one of the hot areas for practical applications of today's ML technologies (just think about the importance of recommendation systems)
- But music has also always kept its strong roots in history and tradition and has provided a sanctuary and refuge for the emotional and spiritual needs of people.

Automatic Music Generation with Deep Learning, Ali Nikrang (AT), © Yazdan Zand



THE BIG CONCERT NIGHT 2019

The „Mahler-Unfinished" Project

In cooperation with the Bruckner Orchestra Linz

Since 2003, the collaboration with the Bruckner Orchestra has been an integral and unique part of the Ars Electronica Festival. It is a collaboration that makes it possible not only to perform interesting works each year, but also to develop unique artistic projects that bring together a wide variety of orchestral music, electronic music, robots, dancers and digital images. An essential aspect of the concert nights in the Gleishalle was and is the unique space itself, with its significant acoustics and "wild" backdrop. But the large-scale projections and live visualizations have also become a special characteristic, along with the artistic staging with industrial robots and machines. This year, an AI system will also be involved for the first time.

The Big Concert Night 2019 is the third major project to be developed and performed with Markus Poschner as principal conductor of the Bruckner Orchestra.

After Bruckner's 8th Symphony and Berlioz's *Symphonie Fantastique*, the Big Concert Night will now focus on the last and unfinished work by Gustav Mahler, his 10th Symphony.

The concert begins with "Mahler Remixed," by Christian Fennesz, one of the main protagonists of the Austrian electronic music scene, who has already been involved with Mahler in 2011 and has transformed various samples from Mahler symphonies into tonal and musical material for his live performance. Towards the end of this first part, Markus Poschner will improvise on the piano and, together with Christian Fennesz, build a bridge from electronics to the orchestra's performance and into the second part of the evening. Johannes Braumann and the Ars Electronica Futurelab will continue a collaboration with dancer and choreographer Silke Grabinger, which began last year, to bring to life a human-puppet-machine system in which Silke Grabinger will interact artistically as solo dancer with a configuration of six Kuka industrial robots. Amir Bastan, Peter Freudling and Stefan Mittlböck-Jungwirth-Fohringer are also involved in the development of this human-machine choreography.

The movements of the robots slowly coming to rest and the fading of their characteristic engine noises are then replaced by the striking initial motif of the viola in the third part of the evening, and the orchestra starts Mahler's symphony No. 10. The viola motif, the first ten notes of which were entered into one of the currently most powerful machine learning systems (MuseNet from OpenAI) as a starting theme, then begins again seamlessly, as a further movement, so to speak. The result of the machine learning system, which premieres at the end of the evening, was taken over completely unchanged and has been orchestrated by Ali Nikrang and Markus Poschner. This year, Akiko Nakayama from Tokyo will come to POSTCITY for the live visualizations of the orchestra, the Berlin artist Lillevan will visualize the electronic part of Christian Fennesz.

Mahler 10:10 — Challenging the AI

Unfinished" — the concept was and still is a challenge: not so much in the sense of finishing, but to think ahead and reinterpret. Especially in the second half of the 20th century, many artists tried their hand at this open legacy at the end of a musical and historical epoch.

Today, in the 21st century, it is of course particularly appealing to take on the challenge again with the latest technical possibilities — not to imitate or improve Mahler, but to measure our artistic approaches as well as our technical possibilities against it. The path to new possibilities of expression always leads through the transformation of what has shaped us before, is always testing the limits and exploring what evolves from it.

Ali Nikrang, AI expert at the Ars Electronica Futurelab, computer scientist, composer and pianist (graduate of the Mozarteum Salzburg) has developed an AI-based adaptation of the significant viola theme at the beginning of the 10th Symphony especially for the *Mahler Unfinished Project*. For this purpose, he worked with Musenet, currently the most powerful GPT-2-based machine learning system for musical applications from OpenAI. The first ten notes of the original melody were given to the system as well as stylistic parameters according to which the AI system then composes any number of new interpretations. Ali Nikrang selected one of these compositions and then orchestrated it again "by hand" without any changes.

A project by Ars Electronica and Bruckner Orchestra Linz
Orchestra: Bruckner Orchestra Linz, principal conductor: Markus Poschner; Electronics: Christian Fennezs; Artificial Intelligence: Ali Nikrang, Musenet OpenAI; Human-machine performance: Johannes Braumann, Silke Grabinger, Ars Electroncia Futurelab, Peter Freudling, Stefan Mittlböck-Jungwirth-Fohringer; Live Visualizations: Akiko Nakayama, Lillevan, Amir Bastan, Supported by Yamaha

Uncertainty and Wonder

Comprehending the age in which we live is not an easy undertaking. We are frequently unable to see the forest for the trees. In 1910, Vienna — at the time the seventh-largest city in the world and the fourth-largest in Europe — was already a metropolis of two million people. Which it will be again soon. Emperor Franz Joseph still ruled over a multinational state, Gustav Klimt was leaving his indelible mark on art nouveau, Arthur Schnitzler was provoking theater scandals, Max Winter was writing the first social reportages, and Sigmund Freud was conducting groundbreaking work in the interpretation of dreams. Vienna was a "Silicon Valley of thought" (Allan Janik) and in the midst of a major upheaval, as was the entire epoch. "You alone know what it means," noted Gustav Mahler above the conclusion of his unfinished Symphony No. 10, a reference to his wife, Alma. A serious marital crisis had accompanied the composition of the work, leading Mahler to consult Freud at the end of August 1910 in the Dutch spa town of Leiden. Arnold Schoenberg believed that in Mahler's "ninth," which at the end falls silent in a pianississimo, the composer no longer speaks as a subject. But this "subject" then reappears in the subsequent symphony fragment in a highly expressive manner: the last gasp of an "ego"? The composer died the following year, and the Tenth Symphony can be seen as the soundtrack to his lovesickness—"With all the horrors of this time in it," as Alma Mahler wrote in a letter. The work reflected the state of matters at the time. The Adagio we will hear today begins with a recitative-like "swan song" by the violas, which also played the final gesture of the Ninth Symphony. They are entrusted here with a fresh start: the end contains the beginning; the downfall holds within it the departure into yet unknown terrain. "Against orientation, stability and knowledge—uncertainty and wonder," as the Spanish sculptor Eduardo Chillida wrote.

Text: Norbert Trawöger — Artistic Director Bruckner Orchestra Linz

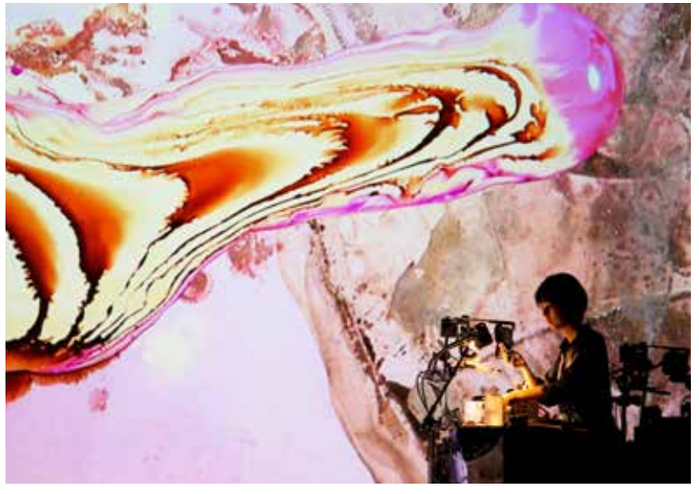
KUKA robot, © KUKA Deutschland GmbH

Akiko Nakayama (JP)

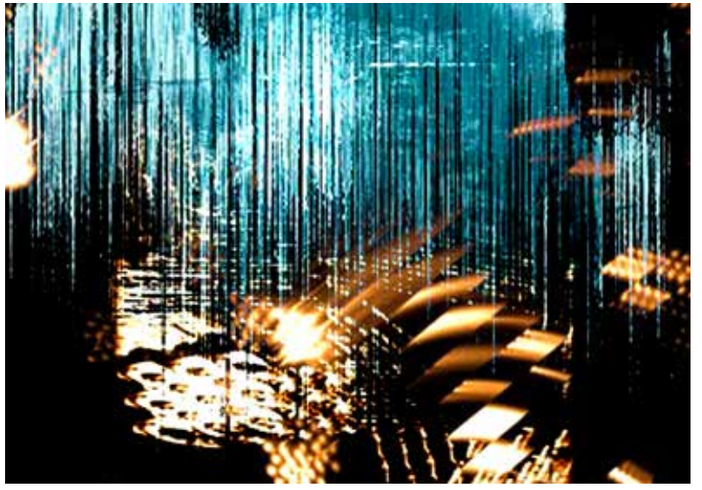
Alive painting for Bruckner Orchestra

Alive painting is a live performance of dynamic, changing pictures and sounds. During the performance, people concentrate on the beauty of blending paints, as well as the philosophical meanings of colors, shapes and movement. This is the second appearance of *Alive painting* with the Bruckner Orchestra. The entire body feels the joy and dynamics of music created by the Bruckner Orchestra. The audio-visual element unites the musicians and audience in one larger-than-life artistic experience.

Technical Assistant: Masaki Fukui



Haruka Akagi



Christian Fennesz (AT), Lillevan (SE/IE)

Mahler Remixed

Austrian guitarist, composer, and electronic musician Christian Fennesz is recognized as a key figure in the electronic music scene today. His wide international reputation has been consolidated through his substantial contribution to a new musical expression. Within the last 10 years, Fennesz has collaborated with many musicians, filmmakers, and dancers such as Ryuichi Sakamoto, David Sylvian, Keith Rowe, Mark Linkous of Sparklehorse, and Mike Patton. At this year's Ars Electronica Festival, Fennesz will perform *Mahler Remixed*, which was initially recorded live at Radiokulturhaus, Vienna by Christoph Amann, in May 2011. Together with visual artist Lillevan he will re-contextualise samples taken from Gustav Mahler's symphonies.

AIxMUSIC
ST. FLORIAN/POSTCITY

Rupert Huber at the Mamorsaal of Stift St. Florian during an event at Ars Electronica 2006

Volkmar Klien (AT)

Cumulus — Stratus

A Composition for a Peal of Bells

Volkmar Klien lets St. Florian's bells swing and produce aural shapes in the sky around the abbey with the assistance of AI-based pattern-recognition and interpolation. The shapes emerge and morph to melt back into homogenous sound fields covering everything within earshot. They then subside, to give way to distinct sonic formations from above.

Composition: Volkmar Klien

Rudolf Perner

Johannes Novohradsky

Daniel Feyerl

Hermann Nitsch (AT)

organ recital

“for me, the organ is the suitable instrument to realize the music of the orgy-mysteries-theater. my music makes use of long drawn-out tones, uses sound blocks, cluster arrangements, roaring tutti-structures, tonal and dissonant up to noise superposition. everything that strings, woodwinds, brass and synthesizers do in an orchestra, i can do through the organ. at the same time i can produce shrill sounds and meditative tonal arrangements. i can revel in keys as well as wedge myself in dissonances. the force of the birth of galaxies reminds me of the sounds of spheres that permeate the universe. the singing noises (or the music) that cause the orbits of the heavenly bodies reach us. the sonorous and rushing sound of the spherical harmony of the universe becomes audible. the firmament of Johannes Kepler, interspersed with radiant music, is perceived.”

supported by NITSCH FOUNDATION

Quadrature (DE)

Fantasie#1

Audiovisual performance for radio telescope, artificial intelligence and self-playing organ

Outside of the venue, a radio telescope is streaming all incoming data live. The received electromagnetic waves are transferred to an audible frequency range. Electronic noises fill the air. Algorithms transcribe the noise of the skies into midi notes; they are sent to an electronic apparatus which operates the organ. Various selection and filtering processes (e.g. specific artificial intelligences) are applied in a determined order, serving as a basic score and dividing the piece into three chapters. A set of parameters allows it to respond live to the incoming signals, using both the radio telescope and the AI as musical instruments. On the floating canvas above the stage, the sounds turn into abstract images. Little by little, neural networks take control over the organ and seek out familiar harmonies in the otherworldly noises. Ideas of melodies evolve as the artificial intelligence begins to fantasize about familiar tunes in these alien sounds. In collaboration with Christian Losert.

Thanks to Sebastian Müllauer for the telescope and Klaus Holzapfel for his Orgamat; software: HDSDR for receiving telescope signal, MaxMSP for creating MIDI and usage of AI, VVVV for visuals and general control; created as part of the fellowship program #bebeethoven, a project by PODIUM Esslingen on the occasion of the Beethoven Anniversary 2020, funded by Kulturstiftung des Bundes.

Quadrature

SkyBürhaus

Ryuya Amao

Pianist: Francesco Tristano (LU), Flutist: Norbert Trawöger (AT), Violinist: Maria Elisabeth Köstler (AT/DE), Researcher: Akira Maezawa (JP; Yamaha Corporation)

Dear Glenn, — Yamaha AI Project

Yamaha Corporation will be taking part in the upcoming Ars Electronica festival in Linz Austria from September 5 to 9, 2019. With the support of the Glenn Gould Foundation and pianists, Yamaha is pursuing the development of the world's first AI piano solution capable of analyzing and playing in the style of a human pianist while interacting with human musicians in a music ensemble, achieved by training the AI with a combination of both automatic analysis of Glenn Gould's recordings and expert musicians' skills. During Ars Electronica, the AI will be playing in the style of Glenn Gould in real-time to provide an experience of co-creation between an AI pianist and a human ensemble. Yamaha will demonstrate the AI through a concert performance featuring three pieces in the Basilica of the St. Florian monastery on the afternoon of September 7, together with a flutist and violinist from the Bruckner Orchestra, and renowned pianist Francesco Tristano. Additionally, a session will be held, where industry executives will be discussing the theme "Exploring the future of music through the use of artificial intelligence in music performance." Yamaha will also be exhibiting at the POSTCITY where they will display the AI piano together with a documentary film of the project itself.

Yamaha Corporation

This project is supported by
Glenn Gould Foundation
Bruckner Orchestra Linz
Dentsu Inc.
IBM Japan

Maki Namekawa (JP), Dennis Russell Davies (US)

Piano Performance

At this year's festival the renowned pianist Maki Namekawa will perform several pieces by different composers solo as well as together with her husband Dennis Russell Davies.
In the solo part of the performance she plays three pieces by the dutch pianist and composer Joep Beving, whose music has been brought to the attention of a wide audience by the streaming platform Spotify. He has released three albums — *Solipsism*, *Prehension* and *Henosis.*
Joined by Dennis Russell Davies, the duo performs the two pieces *Hymn to a Great City* and *Pari Intervallo* by the much-noticed Estonian composer Arvo Pärt, who is a well-known representative of "New Simplicity". *Hymn to a Great City* was originally composed for two pianos and will be played in a piano four-hands version transcribed by Russell Davies.
The program is rounded of by three piano four-hand pieces of György Kurtág's *Piano Transcriptions of Bach's work*.

The presentation of this performance is supported by Yamaha Corporation.

Reeps One

Reeps One x Dadabots ft. Second Self AI (Live Performance)

Second Self is an art and science collaboration between Reeps One, Dada Bots and the E.A.T. program at Nokia Bell labs. The collaboration is a live performance piece designed to integrate machine learning and generative audio as a practical artistic tool and to raise awareness about machine learning beyond the academic, technological and engineering demographics through the medium of film and performance.
Reeps One grew up using his relationship with AI to develop his abilities as a tournament chess player. Today, machine learning allows us to develop "opponents," "collaborators" and "mentors" in nearly any form of hyper-specialism as long as there is a suitable data set for training. Chess neural nets, using a large dataset of games by expert players, are trained to probabilistically predict the next moves an expert would make. Whereas our vocal neural net, using a large dataset of voices recorded by Reeps One, was trained to probabilistically predict the next millisecond of raw audio.

Reeps One (Creative Director / Artist) — UK
www.reeps100.com
Dada Bots (Machine Learning) — US
https://dadabots.com/
Simon Waldron (Director) — UK
h*ttp://lonelyleap.com/*
Domhnaill Hernon (E.A.T. Program Nokia Bell Labs Director) — US
https://www.bell-labs.com/programs/experiments-art-and-technology/
Nokia Bell Labs (Sponsor)

Klaus Sonnleitner (AT)

Organ Music in the Field of Tension Between Inspiration, Compostition and Improvisation

Klaus Sonnleitner's organ concert takes the audience from Johann Sebastian Bach and Wolfgang Amadeus Mozart to French sound worlds and improvisations in the spirit of Anton Bruckner.

Tomi Mesic

Weiping Lin (AT/TW)

Bach Hauer Scelsi Cage

Weiping Lin presents four different compositional approaches by composers who, in their individual ways, reflected on questions of musical order and its relation to the wider contexts of human existence.

Johann Sebastian Bach (1685 — 1750)
Präludium
Loure
Gigue
(from the Partita No. 3 in E major, BWV 1006, 1720)

Josef Matthias Hauer (1883 — 1959)
Zwölftonspiel "Tanz für Violine Allein"
(Dance for Solo Violin) 1954
Zwölftonspiel für Violine Allein mit
einer Zwölftonreihe von Dr. Emil Weidinger
(Twelve-tone Piece for Solo Violin with
a Twelve-tone Row by Dr. Emil Weidinger)

Giacinto Scelsi (1905-1988)
L'âme ouverte (1973)

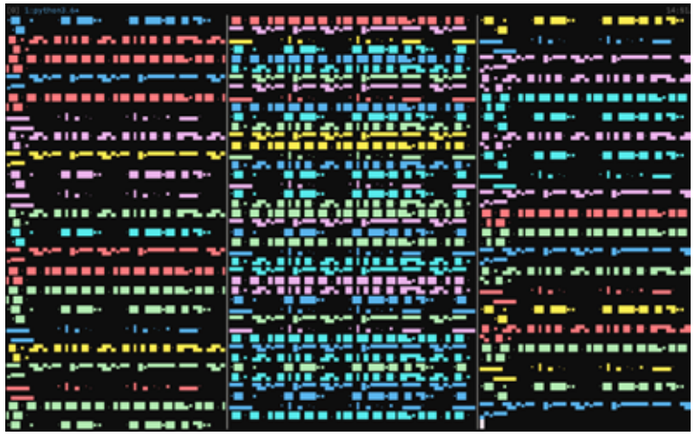
John Cage (1912 — 1992)
Freeman Etude No. 12 (1977 — 80)

Tomomi Adachi (JP), Andreas Dzialocha (DE), Marcello Lussana (IT)

Voices from AI in Experimental Improvisation

Voices from AI in Experimental Improvisation is an attempt to improvise and interact with a computer software which “learns” about the performer’s voice and musical behavior. The program named “tomomibot” is based on artificial intelligence (AI) algorithms and enables a voice performer, Tomomi Adachi (human), to perform with his AI learning independently over time from his past performances.
The project is not only a musical experiment with a non-human performer, but also an undertaking to make computer culture “audible.” The performance raises questions about the logic and politics of computers in relation to human culture.
“tomomibot” is a software based on a sequential neural network. It decides which sound to play next based on which live sounds it has heard before. The software was designed and developed by Andreas Dzialocha. Experimenting with AI sound synthesis algorithms, the developer Marcello Lussana generated a large database of sounds that sound like Adachi.

Supported by Musikfonds e.V. and Initiative Neue Musik Berlin e.V.



Andrea Fichtel

Ensemble Vivante (AT)

The tenor duets of Claudio Monteverdi

The Ensemble Vivante presents the dramatically charged vocal music of a contemporary of Kepler, offering works whose texts reflect the turbulence, innovation and discovery of their time through their depictions of nature and humanity. Monteverdi’s music vividly translates both the harmony of the world and the harmony of the spheres. His tenor duets present an especially vibrant cosmos within his oeuvre. Writing for two equal voices, he constructs a series of wholly differentiated rhetorical positions: moving in synchronicity or shadowing one another; declaiming through dialogue; sparring in their vocalization of inner states of mind as two souls in one breast; or melting into a singular voice that speaks from one mouth.

Tore Tom Denys & Erik Leidal — tenors, Anne Marie Dragosits — harpsichord, Daniel Pilz — Viola da gamba & Baroque guitar, Reinhild Waldek — Baroque harp

Anne Tetzlaff

Jennifer Walshe (IE), Memo Akten (TR)

ULTRACHUNK

What are the implications of using your voice to improvise with a neural network? Composer Jennifer Walshe and artist Memo Akten present *ULTRACHUNK* (2018), a neural network trained on a corpus of Walshe's solo vocal improvisations. Here, Walshe wrangles with an artificially intelligent duet partner — one that reflects a distorted version of her own improvisatory language and individual voice.
For one year, Walshe engaged in a daily ritual of performing solo improvisations in front of her webcam, collecting hours and hours of both video and audio material. Akten created a number of neural networks — including GRANNMA (Granular Neural Music and Audio) — which was trained on Walshe's improvisations. In the performance, GRANNMA navigates the hypersphere, generating ca. 20 frames of video and 44,100 16-bitsamples of audio per second in real time. The video and audio are neither sampled nor processed — every single frame and sound is generated live, constructed from the fragments of memories in the depths of the neural networks. The original and virtual Walshe inhabit the Uncanny Valley together, singing in duet, improvising, listening and responding to each other.

ULTRACHUNK was commissioned by Somerset House Studios with the generous support of the Case Foundation.

Wolfgang Mitterer (AT)

GRAND JEU 2

Konzert für Orgel und Electronics

In *Grand Jeu 2* the large Bruckner organ in the monastery St. Florian is extended and superelevated by a second, electro-acoustic instrument. This multiplies the tonal possibilities, the typical organ sound is modified and mixed with unheard sounds. The resulting textures can be condensed with cluster playing and semi-improvised organ playing techniques to form massive auditory events. The piece is "half-composed". This approach makes it easier to respond to the specific register and playing possibilities of the existing organ. *Grand Jeu 2* is a journey from György Ligeti's *Volumina* (1962) to the 21st Century.

Julia Stix

Roberto Paci Dalò (IT)

Tenebrae

A solo concert for clarinet (and bass clarinet) that works with the very special acoustics of the Marmorsaal at Sankt Florian, playing with its reverbs and multiplying the seemingly monodic instrument. It is a clarinet rich in technical features and timbres, which sometimes makes a timbral memory appear, borrowed from practices and memories of electronic musical culture. A meditation evoking many musical forms from the Gregorian to the style of composers such as Claudio Monteverdi and Carlo Gesualdo da Venosa. Tenebrae (Latin for "darkness") is a religious service of Western Christianity held during the three days preceding Easter, and characterized by gradual extinguishing of candles, and by a "strepitus" or "loud noise" taking place in total darkness near the end of the service. *Tenebrae*- has been created for Ars Electronica Festival.

Ambra Galassi

Music, clarinet, bass clarinet: Roberto Paci Dalò
Production: Giardini Pensili, Ars Electronica Festival
Created for Ars Electronica Festival 2019. World premiere

Ali Nikrang (AT)

Automatic Music Generation with Deep Learning

Fascination, Challenges and Constraints

In recent years, there has been a great deal of academic interest in applying Deep Learning to creative tasks such as generating texts, images or music, with fascinating results.

The research interest in these generative models is based on the assumption that producing new, similar data is only possible by learning some essential understanding of the nature of the input data.
Technically speaking, Deep Learning models can only learn the statistics of the data. Thus, they often can learn relationships in the data that human observers have not been aware of, and can therefore serve as a new source of inspiration for human creativity.
This workshop focuses on current technical approaches for automatic music generation. We will also discuss questions like: What makes musical data so special? What are the structures that only occur in musical data? What can artists, scientists or music enthusiasts expect from these models? To what extent do listeners accept music composed by AI?

The presentation of this performance is supported by Yamaha Corporation.

Ali Nikrang (AT), Michael Lahner (AT)

Looped Improvisation

Can improvisation be looped? We use *Piano Genie* for real time improvisation of piano music with a pre-recorded looped input. *Piano Genie*is a creative AI application developed as a part of Google's Magenta project that maps an input consisting of 8 units to 88 keys of a piano in real time. It is based on a technology called LSTM (Long short-term memory), a type of artificial neural network for learning and recognizing patterns in sequences of data. After training, *Piano Genie* can predict the next note based on user input along with the previously played musical content. However, because of this second condition, the same input can produce a completely different output at each playback.
We generated several short sequences that are played as input in a loop. As a result, the application will continue to create new outputs despite the same input.

Piano Genie: Chris Donahue, Ian Simon, Sander Dieleman (Magenta, 2018)

Martina Claussen (DE)

Interactions II

Voice and sound recordings, together with sound objects, weave a "sound carpet" which provides the basis for an electroacoustic journey. These textures act as a sort of humus for voices, from which they repeatedly emerge in fragmented form. Associations of the most diverse kinds and unexpected connections are evoked.

Markus Gradwohl

Rupert Huber (AT)

Origenesis: Spatial Piano Improvisation Inspired by Mountain Formation

Origenesis happens when plates of the Earth's crust move and collide or crumple; the result of which may be a new mountain. When two continental plates collide, one subducts under the other. My piano improvisation represents this process by putting sound to the formation of an imaginary mountain.
Two scales collide and eventually create a new high point. I developed a piano technique that corresponds directly to the surroundings, the space and the sounds around me. It is somehow more of a dialogue than a monologue.

The presentation of this performance is supported by Yamaha Corporation.

Larry Hirshowitz

Jérôme Nika (FR), Rémi Fox (FR)

C’est pour ça

Saxophone Improvisation Concert (IRCAM)

In “digital lutherie,” artistic collaborations are inseparable from the technological aspects. This is why Rémi Fox has been involved since the very beginning in the creation of the DYCI2 generative agents developed by Jérôme Nika. The name of the duo, *C’est pour ça* [That’s why], is a nod to its early days, when the performances were intended to be didactic rather than purely creative, focused on tests and demonstration. This “digital lutherie” has now reached a stage of maturity sufficient to serve as a basis for a purely musical research, combining “meta-composition” and free improvisation: composing the “musical memories” of improvising agents, the structures underlying their musical discourses, their listening and reaction mechanisms, and allowing the form to be generated by pure interaction. *C’est pour ça* develops an electronic aesthetic while seeking to preserve the organic character of the summoned “memories” (traditional choirs, spoken voice, saxophone playing modes…).

Muku Kobayashi (JP), Mitsuru Tokisato (JP)

SHOJIKI “Play Back” Curing Tapes

Rewinding curing tape with a motor. The performers use a switch to control the rotation direction of the motor and its ON/OFF. Each time the tape is rewound on to the motor axis, it makes peeling sounds and continuant sounds. Magnetic tapes, such as cassette tapes, play back sound through magnetic heads when they are rewound from one axis to another. The performance of Shojiki analogically connects the two movements of “Rewinding a magnetic tape” and “Rewinding a curing tape.” The magnetic tape, which is a sonic reproduction medium, is coated with a powder that can be magnetized, called a “magnetic substance;” on the other hand, curing tape is coated with an “adhesive agent.” Sounds can be recorded, played back and erased on magnetic tapes many times, and on the other hand curing tapes are made for temporary adhesion, and therefore can be taped on and peeled off several times. Just as the magnetic substance on the magnetic tape wears down and degrades, the adhesive agent on the curing tape also becomes weak after long use. Shojiki refers to the physical characteristics of sonic reproduction mediums from this coincidental tie between the two different tapes, and “playback” curing tapes.

Thanks: Makoto Oshiro
Supported by Japan Media Arts Festival (Organized by the Agency for Cultural Affairs, Government of Japan)

Ryoichi Kurokawa (JP)

Ittrans_ctx

Silent diptych video installation developed originally from the series of diptych prints *Ittrans (2018)* inspired by “laminar–turbulent transition,” the process of a laminar flow becoming turbulent is not yet fully understood scientifically.
The print piece is expressed before and after transition on each panel, while the animation presents its constant by displaying each non-transitional motion respectively in parallel. Since the original print works were created as static images, context was animated afterwards. Images generated based on the detected feature point of captured natural plant life are split into a diptych, and oppositional algorithms (order/disorder behaviors) are applied to those images. Vertical/linear movement representing laminar flow is applied on the right-side image, and on the left side one random motion/step is applied as turbulent flow. It shows confrontational evolutions presented as laminar and turbulent flow: unidirectional and chaotic motion.

Concept, direction, design: Ryoichi Kurokawa
Producer: Nicolas Wierinck
Coproduction: K11 Art Village, Wuhan (CN)
Produced by Studio RYOICHI KUROKAWA
Courtesy of the artist

Leonhard Schmidinger (AT), Fabian Homar (AT), Vladimir Petrov (BG/AT)

Bruckner Percussion plays Xénakis

Iannis Xenakis (1922-2001) composed *Okho* for three djembe players. The premiere took place on October 20, 1989 on the occasion of the Paris Autumn Festival.
Using the West African djembe and his mathematical and stochastic composition technique, Xenakis succeeds in creating a tribal modernism. Our interpretation deviates from the original instrumentation and makes use of an extended percussion setup of the kind Xenakis himself uses in his solo piece *Rebond B* for percussion.

Alex Braga (IT)

A-MINT

Artificial_Music_Intelligence_

A-MINT is a metaphor for a sustainable future, where man and machines work together in perfect symbiosis to cross a frontier that man alone could not dare. *A-MINT* is a new kind of adaptive Artificial Music Intelligence, the first one of its kind capable of cracking the improvisation code of any musician in real time and improvising with him or her. It is a new organic and lively form of contemporary electronic music, creating music and video along with the execution, without any preset pattern, pitch or bpm. The futuristic real-time electronic orchestrations, enhanced by generative video projections, rewrite the rules of live electronic music, and plunge the audience into a unique experience, always different because of the impulses and interpretations of the Artificial Music Intelligence A-Mint, a trip into the unknown and unexplored territories and boundaries, made of new sounds, technology, images, energy, sweat, heart and soul.
A-MINT is the first artificial intelligence to enter conservatories and musical institutions as a proper instrument studied alongside the traditional ones. Braga is the first artificial music intelligence teacher with his masterclasses in Conservatorio Santa Cecilia in Rome, University Pompeu Fabre in Barcelona and Conservatorium in Brussels.

A-MINT is a project by Alex Braga, coded by Professor Francesco Riganti Fulginei and Antonino Laudani of the University ROMATRE, in collaboration with !K7.
The project is supported by Italian Ministry of Foreign Affairs, ITMAKES, Maker Faire European Edition, Conservatorio Santa Cecilia.
The presentation of this performance is supported by Yamaha Corporation.

Keiichiro Shibuya (JP), Eizen Fujiwara (JP), Justine Emard (FR)

Heavy Requiem — Buddhist Chant: Shomyo + Electronics

Keiichiro Shibuya is a composer and musician based in Tokyo and Paris. He is collaborating across various disciplinary fields, producing work with scientists, visual artists and dancers.
The Japanese Buddhist chant form known as *shomyo* has a 1200-year history, ranking it together with the West's Gregorian chant as one of the genre's oldest living forms.
This will be a unique collaborative performance of integrated electronic and traditional Buddhist music.

Keiichiro Shibuya

Shomyo (chanting of Buddhist priests): Eizen Fujiwara
Computer, electronics: Keiichiro Shibuya
Visualization: Justine Emard

Yishu Jiang (AT)

Johann Sebastian Bach: Suites for unaccompanied cello

The Bach cello suites played in the performance are structured in six movements each: prelude, allemande, courante, sarabande, two minuets or two bourrées, and a final gigue. The Bach cello suites are considered to be among the most profound of all classical music works.

Thomas Gorbach (AT)

The Vienna Acousmonium

A vibrating instrument to create ephemeral dynamic motion sound sculptures

Acousmatics (*acousma* in Greek means "aural cognition") is the cognitive science of listening; a listening to listening. To make this possible, unheard sounds and compositions are projected through an orchestra of loudspeakers: the Acousmonium. Over the past ten years, Thomas Gorbach and Marco Schretter have developed *The Vienna Acousmonium*, a unique setting of loudspeakers, hardware and control units that allow the projection of *oeuvres* as concerts or permanent sound installations. Accompanying this development, Gorbach invented a specific interpretive technique: ephemeral dynamic motion sound sculptures — a method for the spatial distribution of intrinsic sonic space information.

In cooperation with Ars Electronica and IGNM-O.Ö.

Stefan Tiefengraber (AT)

WM_EX10 TCM_200DV TP-VS500 MS-201 BK26 MG10

2015/19 — multi channel audio/video noise installation and performance

Unexpected and uncontrollable analogue signals are altered and bent by the artist to create an audio/video noise-scape. The used electronic devices, such as "Walkmans" and "Bontempi" keyboards, are usually designed for very specific purposes. The artist goes beyond the limitations of predetermined functions and generates sound and video through short circuits produced with wet fingers on those opened devices. The resistance of the skin and the conductivity of the human body in combination with the components of the circuits modify the sound.
Additionally, found home recordings, which were rescued from disposal and destruction, are used to create an interplay between the recorded voice and random atmosphere sounds on the backside of the tape. Feedback and rewinding alter the text on the psychological development of children.
There is no prior modification of the used devices. Pre-recorded (installation) or live audio signals, audible through speakers, are sent directly to CRT monitors mounted on the speakers, visualizing the signal in flickering and abstract shapes and lines in black and white to create a time-based sculpture.

www.stefantiefengraber.com
Speaker: Maria Tiefengraber
"So denken Kinder. Einführung in die Psychologie der kognitiven Entwicklung," written by Usha Goswaml

Werner Jauk (AT)

AI-Pop. Walking *sound-knowledge*-base

hedonic post-digital body-culture: “backlash” towards an emotionally intelligent “auditory culture”

It is the bodily experience of sound that determines its structuring: sound brings the body in motion leading to e-motion generating sound — interaction leads to a collective and collectivizing dynamic soundstream of being “communis.” Participants enter an ever “new” sound environment; its “affordance” excites e-motion, by this sound. Despite a semiological concept of “information transmission,” sound stimulates “communication.” Sonic performative interaction communicates by the expression of the meaning of the sound / the motion to the body and the stimulation of “emotional contagion.” Basically, it is “intensity” that is the meaning of sound to the body. The concept “sound-gesture” describes / explains this process. Its mediatization, the coding of its “picturing,” brought up the “sight” of musical structuring as “relational thinking” — “forward back” media technologies close to the body allow immediate bodily structuring for every body. Analysis of this kind of motion is the analysis of emotionally “intelligent” experience — this knowledge base generates an emotionally intelligent system, “popular” music: AI-Pop for every body. Being a paradigm of structuring environments based on the “needs” of the body, the entrance into the sound-environment is a structuring entrance into post-digital media-worlds: Because of the transgression of the mechanistic paradigm in digital culture it is a “backlash” to the hedonic nature of media-culture as “auditory culture”.

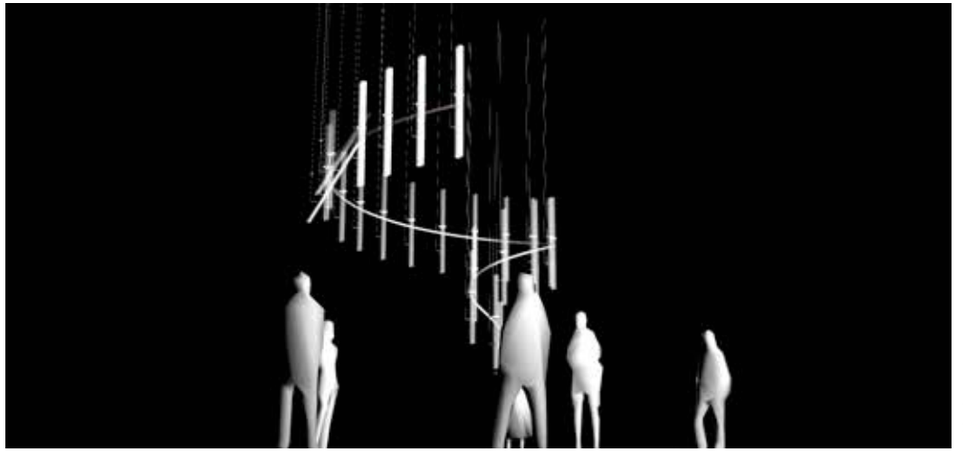
Thomas Grill (AT)

Mutual Understanding

We are witnessing two acoustic agents incarnated by large horn loudspeakers as they incessantly exchange acoustic codes. Based on models of human vocalization, they develop their vocabulary independently from a natural language. In their ongoing discourse, they follow a common goal: to maximize the beauty of their own vocal expression. The concept relates to an experiment by the Facebook AI team in which chat bots were given the task of optimizing their language for negotiation efficiency. The language soon became impossible for human eavesdroppers to interpret.

Mutual Understanding expands on this experiment, treating it as an aesthetic problem, investigating the possibility space of language and its technical measurability.

Supported by the Austrian Science Fund (FWF), project AR445-G24.



Mikhail Mansion

Yasuaki Kakehi (JP), Mikhail Mansion (US), Kuan-Ju Wu (US)

Soundform No.1

Soundform No.1 is a minimalistic soundscape and kinetic art installation that transforms heat energy into a poetically evolving, spatiotemporal composition.
Sound is created thermoacoustically by activating heating elements inside quartz glass tubes. As the glass warms, a nickel-titanium spring reacts, pulling the cylinder upright. At the correct angle, airflow becomes unrestricted, and a thermoacoustic phenomenon, known as a Rijke effect (named for the professor who discovered the phenomenon in 1859), creates an audible tone. The tone is a product of the glass tube’s length and diameter, combined with the rapid change of temperature in the air column.
Through a modulation of heat, light and motion, *Soundform No.1* creates an ever-changing atmosphere of Zen-like tonal patterns and visual effects.

This project is created by the artist collective Natura Machina, and is supported by University of Tokyo, JST ERATO Project, UC Berkeley CITRIS Invention Lab, UC Berkeley Jacobs Institute for Design Innovation, and by Transmission Arts LLC.

Volkmar Klien (AT)

Anschwellen — Abschwellen

A performance apparatus

A slightly elevated and imposing neo-gothic clock occupies the center of a space, ticking steadily. Over the course of several minutes, it slowly unfolds the unexpected splendor of a huge crown of peacock feathers while increasingly flooding the room with sound.
Fully erect, the clock dominates the space for a while to then subside; its feathery crown sinking in front of it.
Eventually all elements return to their home positions so that another cycle of automated self-augmentation, of algorithmic art referencing basic bodily functions and dominant behavior can commence.

Volkmar Klien

Volkmar Klien concept & production
Hannes Köcher motor control, sensor system
Jakob Posti production assistant, feather expert

Dmitry Morozov / ::vtol:: (RU)

Umbilical Digital

Umbilical Digital is kind of a farm where a special algorithm devotes itself to raising “digital living creatures” such as Tamagotchis. The system monitors their condition and takes on all tasks that are required for maintaining their “life” and keeping their “spirits” up. The simulation of pressing keys makes the system seem like a person who is taking care of the digital creature: it exists as if it has been “raised” by a human hand. By observing the behavior of the “organisms,” the algorithm continually learns and changes itself. All processes are printed out in real time by a small thermal printer, creating a sort of “chronicle” of the farm that offers a comprehensible record of the history and development of the colony.

Commissioned by LABORATORIA Art&Science Foundation (RU) for the exhibition Daemons in the Machine, 2018

Volkmar Klien (AT)

Das audiovisuelle Archiv

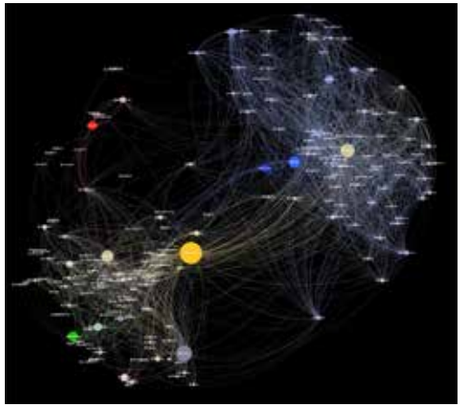
The *AV archive* presents not only a collection of sounds and images, but an entire system to put things into proper order; sonically as well as visually. It is comprised of archival cards with analog audio tape on their backs organized in folders and boxes as well a dedicated reading apparatus, the *Lesegerät*.
The archival cards connect images (drawings, scores, etc.) to short recordings of related sound accessible only through AV archive’s proprietary *Lesegerät*. The connection between the sonic and visual here is purely poetic. The analogue version of the AV archive is counterpointed by a digital version on snark.art’s blockchain-based platform entitled *Sometimes a Thousand Twangling Instruments*.

https://snark.art/1000-twangling-instruments
Volkmar Klien: concept, audio, imagery
Ing.Thomas Holota: prototyping of the ”Lesegerät” (*http://holota.at/*)
Jakob Posti: production assistant, image processing
Snark.art: implementation of player app, blockchain-based production platform (*https://snark.art/*)

Vladan Joler (RS)

Critical Cartography: Unauthorized Blue Prints

Governments, political actors and companies are now experimenting with more sophisticated ways (harder to detect and document) of exerting internet control and disturbance in the information flow. The aim of this analysis was to explore (and visualize) some of the forms and methods of interventions that various political actors or power structures have been using to control and conquer various online spheres. Here we mostly focused on hidden, indirect actions, interventions by unknown actors, companies without visible ties to government officials, political troll armies and troll lords and “artificial” entities.
This map is based on a 5-year internet monitoring process and over 400 different cases of violations documented and analyzed by the Share Foundation. Though different methods represented in this map are observed in our local context, we believe that they are also being used worldwide in similar forms. This map is an attempt to interconnect most of those issues into one map, one possible narrative, one possible reading of those processes.



Koray Tahiroglu (FI/TR)

NOISA

Network of Intelligent Sonic Agents

NOISA, the Network of Intelligent Sonic Agents, is an interactive music system that monitors the performer's actions and provides autonomous and non-intrusive counteractions. In this co-creative music performance, intelligent sonic agents are designed to support the music performance by providing responses that encourage and maintain the communication and motivation of the performer with the *NOISA* system. The sonic agent is an entity in each *NOISA* instrument that learns relationships between sonic agents, performer and musicscape. Each sonic agent has a machine-learning model for predicting and adapting its behavior during the performance.

Regression algorithms, which use a tree model to derive the predicted parameter value from decisions and branches, lead to predictable and representative behavior based on the learning data. The *NOISA* project elevates people's creative thinking, engages them in investigation, and contributes in positive ways to the co-created arts with machine learning and AI.

This project is supported by Aalto University — Department of Media SOPI research group — and Academy of Finland (project 319946). We acknowledge the work of Valtteri Wikström, Thomas Svedström, Niklas Pöllönen and Juan Vasquez in this project.

Institute of Computational Perception, Johannes Kepler University (JKU) Linz (AT)

Computers that Learn to Listen

AI x Music Research at the Institute of Computational Perception, Johannes Kepler University (JKU) Linz

This video demonstrates some results of scientific research in the field of AI and Music being carried out at the Institute of Computational Perception at Johannes Kepler University Linz (Austria). Based on the latest advances in machine learning, our computers learn to "listen to" and "understand" music, recognizing beat and rhythm, instantly identifying music pieces from a few played notes, following pianists and whole orchestras live in the concert hall, and learning to read music directly from images. Demos are shown of autonomous drum robots and other kinds of musical companions that turn music pages for pianists, provide synchronized scores to concert audiences, and accompany soloists. In a final video, we use a MIDI theremin to control expressive aspects of a piano performance in real time.

The scientific research behind these demonstrations was supported by the Austrian Science Fund (FWF) in the form of a Wittgenstein Prize (2009) to Gerhard Widmer, by the European Union (7th Framework Program, project 601166 "PHENICX"), and by the European Research Council ERC (Horizon 2020 Program, ERC Advanced Grant project 670035 "Con Espressione").

Wiener Sängerknaben (AT), Gerald Wirth (AT)

The Neuromusic Education Simulator (NES) Project

Revolutionizing Music Education

In cooperation with developmental psychologists and pedagogues, Professor Gerald Wirth developed his engagement-centric teaching methodology — the Wirth method — aiming at constant high-level student attention. Through neuronal networks activated when using movement to support teaching and through repetitions with variations, contents are sustainably stored in the long-term memory. The teachers constantly react to student performance by changing teaching actions and focusing on improvement rather than failure, which keeps the students' attention at a high level and helps them experience immediate success. The use of NES based on the Wirth method and applying VR & AR allows teachers and students to practice, gain experience and receive feedback. This also implies the detection of such talents or deficiencies as ADHD.

This project is funded by Musikpädagogische Forschungsstiftung der Wiener Sängerknaben, Vitznau and supported by Prof. E. Vanecek (University of Vienna), Prof. L. Jäncke (University of Zürich), Prof. V. Kumar (Athabasca University Canada), Prof. T. Parsons, (University of North Texas), Prof. K.Rubia (Kings College London).

Lukas Beck

Domhnaill Hernon (US)

Nokia Bell Labs

Nokia Bell Labs Experiments in Art and Technology (E.A.T.) present an interactive experience fusing music and image. Continuing in a long line of works around the theme of "Making Visible the Invisible," audience members will experience two different pieces.
In one piece users' movements are captured by a camera and processed through the Bell Labs Motion Engine. The motion engine employs advanced machine vision and video analytics to discern invisible patterns of movement in nature. These natural movements are transformed into audio-visual experiences that convey the hidden patterns of music in all natural movement.
In the second piece, the audience will experience the limitations of how we use our voices today and explore the hidden creative potential of AI.

In our collaboration with Reeps One (leading vocal experimentalist) called *We Speak Music Reeps* we create an AI digital twin called Second Self. We expose the hidden potential of AI to augment our creative existence and the hidden capability of the human voice to enable new forms of human connection.

Jean Beauve (FR)

0W1 Audio

D5, the first IoT Speaker

0W1 Audio is a music-tech start up that designs IoT audio platforms. We have partnered with Sacha Lakic to craft beautiful portable audio systems that deliver incredible natural sound. The D5 series are the 21 Century Music Box, a fresh and new approach to music speakers. “Sound is the vehicle while music and applications are its fuel.” We have two pending products: the D5 Master and the D5 Slim. We are also designing

OEM/ODM IoT audio systems and we have a working proof of concept for the automotive industry that has been very well received by the Innovation Team of the PSA Group.

The D5 project is a collaborative partnership between Sacha Lakic Studio and 0w1 audio technological expertise.

Taishi Fukuayama (JP)

Amadeus Code

Amadeus Code is a songwriting assistant powered by artificial intelligence. The mobile app provides the user with unlimited topline melody inspiration on top of various chord progressions, quickly creating sketches of new musical compositions. The purpose of the app is to remove the user’s personal frame of reference and enable collaboration with a machine capable of extending the human creator’s creativity.

https://amadeuscode.com/

Florian Richling (AT)

ForTunes

Music creators have become the fastest-growing force in the music ecosystem. *ForTunes* sets out to be a one-of-a-kind multi-platform notification and analytic service for artists, producers, and bands to improve decision making and optimize career planning. *ForTunes* is an all-in-one insights app for a new generation of music creators.

Supported by Vienna Business Agency, AWS, Speedinvest

ForTunes

Oleg Stavitsky (RU)

Endel

Personalized adaptive soundscapes that help you focus, relax, and sleep

Vika Bogorodskaya

Endel is a technology that creates personalized sounds to reduce stress, increase focus and improve sleep and is supported by science. The sounds are generated in real-time based on various inputs such as one’s location, time, heart rate and cadence collected through one’s phone. *Endel’s* technology currently exists in various forms such as iOS and Android apps and an Alexa Skill, with tvOS and a standalone Apple Watch app coming soon. In addition, it will soon be integrated into various hardware and platforms in mobility, hospitality, retail, workspaces, etc., with endless applications.

Endel is a Techstars Music 2018 company, it was founded in 2018 as the brainchild of a Berlin-based team of developers and artists. Investors include the Amazon Alexa Fund, Avex Inc., Powerhouse Capital, Waverley Capital, Plus 8 Equity Partners, Kima Ventures, Impulse Ventures, Major Lazer’s Jillionaire, and the world-famous DJ La Fleur. We will put up a poster with a QR-code and a promo code for all visitors to get a free 1-year subscription for all participants.

Cooperation partners: Amazon Alexa Fund, Techstars Accelerator, Coca-Cola, Warner Music, Avex Inc.

Aleksey Igudesman (DE/AT), Julia Rhee (KR/US), Dominik Joelsohn (DE/AT), Ivan Turkalj (HR/AT)

Music Traveler

Search. Book. Play.

Music Traveler is a peer to peer platform that helps musicians host or book a space all in one place. Our team created this product with the belief that nobody should have to spend hours looking for a space just to create magic with music! Musicians shouldn’t have to get into music school just to be able to access and experience a practice room. Use of professional gear, instruments, recording studios, and concert venues should be easy and affordable for everyone. We understand how stressful it can be to find a rehearsal room when touring and traveling the world as an artist. *Music Traveler* reduces these barriers to make your life easier. Save time, energy, and focus on creating and sharing your music with the world instead!

We are working together with several partners like Steinway in Austria, the United Nations, Wiener Konzerthaus and the Musikschulen der Stadt Wien. Our project is supported by the Vienna Business Agency. Music Traveler is endorsed by John Malkovich, Hans Zimmer, Billy Joel and many other notable artists on the Advisory Board.

Anthony Moore (UK/FR), Siegfried Zielinski (DE)

Calculated Sensations

7 Stations in a Deep Time Travel through the Sonic World: an Expanded Lecture

The world of music, of sound, can be represented as a never-ending tension between the poles of calculation and sensation. Mathematics and precision determine what we can hear, just as unbridled imagination enriches it. Moore and Zielinski unfold this world in 7 different rooms of the St. Florian Abbey, each of which is dedicated to a theme — in short texts, experimental sounds and dialogues. Their expanded lecture is an invitation to travel in a time machine, a movement through the depths of acoustics and hearing. The media archaeologist and the musician, as well as sound researchers, tell of Chinese cooking pots as archaic instruments for tuning, of Pythagoras, Francis Bacon's Atlantis and Athanasius Kircher's compositional apparatuses from the early modern period. They also address variants of an art of combining initiated by the Catalan monk Ramon Llull, which deeply influenced composers such as John Cage or Arnold Schönberg.

Renata Schmidtkunz (AT)

Conversations with Renata Schmidtkunz

Renata Schmidtkunz hosts three panel discussions in the summer refectory, prominently featuring Josef Penninger, Sophie Wennerscheid, Oliviero Toscani, Amanda Cox, Markus Poschner, Aza Raskin and others. The topic is dedicated to the role of science and research, which initially had to confirm a religious view of the world, then was subordinated to economic rationality, and now, in the dawning age of AI, is reorienting again. Social acceptance in relation to current AI research will be discussed.
Another focal point of the panels will be the new artistic possibilities opening up due to AI applications, which also lead to a variety of novel business models or issues with copyright regulations.

Dialogues at St. Florian

The large discussion rounds are supplemented by a series of dialogues, which take place throughout the day at different locations of the monastery. In an open conversation between two experts, in which the audience can get involved at any time, various aspects and problems are addressed in depth and background information on individual projects, applications as well as research work is offered.

Harald Ehrl (AT)

Guided Tour through the Monastery St. Florian

The guided tour gives a brief insight into the inner life of a monastery. Each room of the monastery has its own special meaning in the life of the monastic community. The Memoria, the tomb of the martyr Florianus, is located in the crypt below the imposing high altar of the splendidly furnished collegiate church, a room that is regarded as the "foundation of piety" by the community. Without any decoration or pomp, the naked stones refer to the simple and clear confession of this man: "I am a Christian." The oratory is the prayer room of the religious family. Three times a day the praise of God is sung together. The religious father Augustine points out that what the mouth prays should be reflected in the heart and in action. Two large windows from the oratory make eye contact with the basilica. Above its main entrance is a quote from the Prophet Isaiah: "I will give them joy in my house of prayer." The library, a rich treasure of knowledge collected and printed over centuries, is even called a "holy house" by the title of the entrance door. Those who enter are astonished at the enormous volume of books, as we are astonished at the unmanageable amount of knowledge available to us today. The "virtual" ceiling fresco portrays the virtues, showing us how we can deal with knowledge in a "virtuous" and useful way.

Volkmar Klien (AT)

Total Optimization and Defiance

About artificial intelligence and musical composition

Automated data collection and processing with machine learning is about to introduce fundamental changes into societal forms of communication. The widespread application of these new technologies leads to tectonic changes in the structure of human societies, which have already progressed quite far.

While it may not seem obvious at first glance, music, and more particularly music composition, is a very suitable field for dealing with these very shifts and reflecting upon them. Music as a form of communication, as the most primordial form of *social media*, influences the human communities where it unfolds in multiple ways and, at most times and for most people, in an unthematic way, i.e. without being reflected in its operation. It is precisely because music is rarely in intellectual focus and can touch the listeners' hearts without language that it is so efficacious. Music creates virtual and hybrid worlds for us to inhabit. In contrast to visual media, it is unrestrained by boundaries and intrudes on us physically: synchronizing, arranging, influencing, motivating.

The musical avantgardes of post-war Europe were dealing intensively, both in theory and practice, with these aspects of music against the backdrop of their relatively new role in mass media. In this respect, this tradition makes for a rich background for questioning new AI-based communication technologies.

For new technical possibilities cannot simply be regarded as neutral extensions of the previous tool box. Any tool will always change the world of its users. And with the possibilities at our disposal to interact with our environment, our perception of the world as our space of possibilities is changing.

The Avantgardes — economical-technical vanguard and the traditions of artistic avantgardes

The compositional avantgardes in the fields of electronic and computer music were, until very recently, acting in close contact and constant exchange with those of technology. Composers were deeply involved in the development of electronic musical instruments and computer music programs from the very beginning. In the meantime, the worlds seem to have separated. The area where most research approaches in AI and music come from, Music Information Retrieval (MIR), appears to be a project of the computer sciences, a branch of information retrieval, rather than an artistically motivated quest for new compositional possibilities. One reason for that could surely be that the concept of an artistic vanguard may appear slightly anachronistic these days. Generally speaking, the age of artistic promises of salvation seems to be over, and it is the proponents of data capitalism who are now being cast in the role of futuristic preachers. In that regard, today's technology prophets are the true successors of the Futurists. The fact that the manifestos[1] of the 20th century avantgardes are just as full of "disruptive" rhetoric as today's TED talks and product presentations is one of the parallels between the tech sermon and the avantgarde manifesto. While artistic avantgardes definitely regarded themselves as "disruptive," they still differ fundamentally from those of data business; for they never saw themselves as "optimized" according to defined procedures. As examples for disruption without intended optimization, Tristan Tzara's "Manifest Dada 1918,"[2] Mladen Stilinovic's "In praise of laziness,"[3] H.C. Artmann's "Der poetische Akt"[4] or Pauline Oliveros' "The Poetics of Environmental Sound"[5] could be mentioned.

1 | Asholt and Fähnders, *Manifeste und Proklamationen der europäischen Avantgarde.*
2 | Tzara, *Manifest Dada 1918.*
3 | Stilinović, *In Praise of Laziness.*
4 | Artmann, *Acht-Punkte-Proklamation des poetischen Actes.*
5 | In: Oliveros, *Software for the People, Collected Writings 1963-80.*

Music & Math, Structure & Order

European music history and theory have been characterized from the very beginning by a closeness to mathematics. Numerological reminiscences, strict harmony, hopes for the revelation of transcendental structures of order in and through music permeate various textbooks of composition. In honor of this occasion we should mention Johannes Kepler's *Harmonices Mundi*[6], published in Linz in 1619, although it is not a music textbook per se.

Regardless of this there is hardly any thoroughly formalized compositional practice in existence. Even the much-quoted serial works of the 20th century are small in number, and the formal methods applied within them vary tremendously from work to work. There can be no talk of a single, established form of serial composition.

Still, based on serial approaches, we can spot some of the aspects that distinguish the current projects emerging from AI research from the traditional approaches in the field of formalized or automatically generated (generative) music. In very broad terms, a transition can be observed from rule-based to data-based approaches. In serialism, at least some attempt was made to establish the most rigid relation of the note pitches and durations to the structure of the compositional whole by a defined set of rules, therefore providing it with a substantiation. In the approaches that are founded in Big Data, the structure of the generated signal is the result of databases from which correlations between the single datasets, for example compositions, can be inferred. For Big-Data informed approaches in automatic generation, interpretation and sorting of music, the focus is not on explicit rules for composition, arranging, theory of harmony or interpretation, but on the data of musical practice. This practice of human music making is to be thought of in a very broad way. Its data traces reach from written scores and audio recordings of musical works to the data of their reception, and to all imaginable sorts of data that can be brought into context by its collectors (position data, surf behavior, status messages, health data, etc.) Music has never confined itself to a set area defined as musical (the score, mere numeric relations or singing), but was always embedded in the social and political whole of human existence. Particularly with regard to music and AI, it is essential to keep this embedding of music in the diversity of societal and individual execution in mind.

Music making? Composing? Machines?

From the composer's perspective, very concrete questions are to be raised about the fundamental basics and the concept of art with regard to quite a few AI-based music projects of the global data economy. However, the eventual appearance of machine-based autonomous musicians in composition, improvisation and interpretation will shed new light on old questions, prompting us to rethink what was already implicitly accepted. For the question of whether a robot, i.e. a software, can make music or compose also implies the question of what it actually means to make music and compose. To quickly anticipate one point: From the viewpoint of art, composition certainly does not confine itself to the production of new music pieces along established and defined expectations about what music is supposed to be and the role it is supposed to play.

Music making?

In this context, reflecting on music is less about pieces of music, or works, but rather a matter of pondering about music making, for music ultimately can only exist as human activity.

Music making (and therefore composing) means forming communities and designing complex, highly dynamic societal structures of human interaction.

6 | Kepler, Johannes. *Harmonices Mundi Libri V.* Linz: Johann Planck, 1619.

In the very beginning, music probably amounted groups of humans singing together, all at the same time and place. Along with the differentiation of musical media techniques far beyond human singing, from bone flutes and drums to mechanical musical instruments to the present digital music-making forms based on loudspeakers and networks, the result is a richness of possibilities to participate in music-making communities that can be selected relatively freely. Headphones and networks allow us to feed ourselves our choice of soundtrack.
Music today has a broad scope/range of roles available, which it can perform according to the specifications and needs of the recipients. Few of them are close to art or mathematics. Music is listened to for recreation or distraction, it serves as a portable habitat and is also used — apart from innumerable other fields of application — as self-medication and horizon putty. The right kind of music performs miracles over the weekends in the clubs around town in propping up the young employees of banks and industries for another week of high performance at the office. It is here that the possibilities and promises of the automatic generation of musical signals and optimized delivery to consumers can most easily be foreseen. All data that correlate or can be correlated with music of the consumers can be included, ranging from consciously chosen playlists and concert visits to reading lists of books, motion patterns and accompanying habits of consumption.

Composing?
The question of what it means to compose or create art is relatively easy to answer at first, if "creating pieces of music" is deemed a sufficient answer. But this would also mean ignoring the obvious impossibility of finding an ultimate, all-encompassing answer to this question. For all conceptual difficulties in the question of "composition" are simply packaged into "music pieces" and are shifted away from the defined problem area. "Music pieces" can be, for the sake of focusing on AI-based music generation, very well defined as signals used by humans as music in a purely pragmatic sense. For the development of algorithms to automatically generate music along established patterns, such a pragmatic definition would be entirely sufficient. From an artistic point of view, this approach remains of course problematic, since the really interesting things tend to happen where majority appeal in everyday musical practice is not exactly the norm.
Therefore, the issue of defining or narrowing down the process to be automated (artistic creation) will already raise fundamental problems. Asking, "What would qualify artistic activity as such?" is totally different from asking how things, or signals conforming with established notions of artworks, could be automatically produced. Art is not a matter of product development within set boundaries, but reflection, politics, and action in the free field.

Machines?
Music making once meant (and in some cases still does mean) gathering in a space for collective activity. Even when somebody sang or played on his/her own, the produced sound was a direct product of bodily acts and only audible for those within earshot, i.e. immediate proximity. Music notation, requiring quite an amount of skill and knowledge both in recording and reception, was the first person-independent medium to transmit music in time and space. Transmission and recording of sound expanded the size of the music making communities enormously in time and space. Human activity leaves audible traces in music, which can be given longevity by media technology, becoming repeatable and portable. The music-making community as such, of course, will not resurge again in technical playback, but a convincing sonic image can be read from the record disk or sound file, even if it will always remain a sort of shadow existence. In these realms of the shades, musicians soon were able to leave sonic traces with the aid of synthesis that no human or mechanical activity could have ever borne. Sampling then allowed us to overlay and construct several music shadow worlds to create new sonic realms. Seen this way, an automatically generated music piece is not only a new sound object, a new sequence of certain pitches in time, but the emulation of traces of communal human activity that has never happened in that form. A topic that with regard to social media — with its fake news, bots and nudging techniques — has already gained broad attention and even broader application.

Hybrid communities, substitutes, asymmetries
In music that we find developments similar to those discovered in other forms of human communication: a transition from *in situ*, via *in print* and *on air* and *on line communities* toward *hybrid* and *substitute communities*. These new possibilities in designing the music-making community result in completely new forms of music making, that — like the technical developments themselves — have to be mostly thought of as embedded within the amenities of data capitalism. The ideal appears to be the delivery of music optimized by the aid of AI, which is totally directed towards the individual consumption needs of the customer. Involving previous habits of listening, seeing and consumption, physiological data (heart and breathing frequency, sexual activities, menstruation cycles. etc.) and information pertaining to the general social and psychological situation can be gathered in order to choose the ideal musical soundtrack, to modify it accordingly or even to generate it anew. By way of dynamic feedback with millions of user behavior profiles (on turning the volume up or even down, will body movement or heart frequency synchronize with the playback?), the technology of playback can be optimized further without the need of conscious verbal feedback by the listeners. Symbolic layers thus appear in the shadow and from the observation of unreflected practices.
Music as an art form shaping communities is always a hierarchical construct with specific interpersonal relations. Listeners engage with each other and the common rhythm, whether dancing or not, and are able to celebrate both a loss of control and a sense of unification with the whole. Media technologies such as notation, amplification and forms of telepresence (from radio to streaming) expand the reach of the common rhythm and harmonies. Music automatically generated by AI technology promises an automatic, "individualized" remote control of music-making communities from the outside. Music making always happens from the first-person perspective. Music is created in participation, otherwise it stays sound, or in the worst case, noise (as in the case of the bass from the neighbor's party). Music making (active or passive) means a lack of distance, whereas observation and data collection are the opposite. AI-based measurement techniques see music always only from an external perspective, while the listeners, i.e. customers, of AI based, automated playback remain in the first-person perspective, an ideally undetached participation. The recipients experience participation in a community, but are actually surrounded by a media feed. The effects, motivations and functionalities of this global playback and substitution machine are left consciously in the dark. Embedded in surveillance capitalism and financialization of all human relations, music can now more than ever sing paeans to the new rule, not only underscoring shifts in power, but even contributing to them, if those exposed to it will perceive an expression of the purest of hearts, testimonies of free, individual artistic needs. Music has always had aspects of distant masturbation (somebody plays guitar on a stage and a group of people feel enchanted/*cozy*), but now whole new possibilities of cynical music are looming on the horizon.
With the measurement of all activity, there is a fundamental asymmetry in the view of things. The customers are running alone in a forest and have to put up with the worm's-eye view, while everybody's motion patterns are recorded somewhere in the control center, where the positions of the trees are also dynamically adapted and underscored by haunting chords. The asymmetries in information flow and design authority in hybrid digital worlds are also a central topic in the context of AI and music.
The problematic part, therefore, is not the substitutional character of the playback worlds per se (in a certain sense music, theater and film always had this element), but the inherent shifts of power structures. At the transition to a total clientele, industrially optimized music will strengthen the individual belief in immediate, personal and free experience. It is thus acting as a lubricant for economic and political shifts. For music is potent. It is not without reason that it can traditionally be found not only in the proximity of rite and mathematics, but also close to narcotics and sexual intercourse. The question of whether an AI is "making music" is therefore similar to the one of whether a sex robot is having sex or not. For the interacting human on the opposite side in each case, this can be answered with yes, but the whole affair seems rather multilayered in nature.

Musical total optimization

AI technologies with their data collections can be used as a wind tunnel of sorts, by testing musical projects in the stream of the recipients in order to be developed and further optimized. The real-time observation of the music-making community in their habitat facilitates the construction of an ideal ergonomic musical signal that adapts dynamically to the conditions; bodily and culturally shaped to fit the conduct of everyday life, non-thematic and hence all the more informative[7]. Such optimized music can be dynamically tailored to the respective situation and person. Whereby the methods of individualization only concern the surface which is shown or pretended to the customers. The algorithm of the machine performing this part-individualization of a single one of millions of transmission channels is configured to be as universal and general as possible.

This musical optimization follows the business models of the data economy, often with the aim of tying up the customers' attention for as long as possible, since music with its power over humans seems particularly well-suited for the subtle influencing of purchase decisions. The intended role of this dynamically generated music appears to be one of a soundtrack to the simultaneously generated parallel world from the transmission with all its asymmetries included. The more "individualized" the playback, the less it will be perceived as a form of conformity and can thus support this process even more efficiently. For within this hierarchy, the chimera of individuality only exists via the playback channel to the consumer. This kind of individualization acts in fact as a great normalizer, revealing itself as a lethal enemy of the individual act.

Those of us who view music also as an art form won't be able to avoid seeing this form of optimization and individualization critically. Since before there can be optimization, we must clarify what has to be optimized, and how. The suspicion seems obvious, that activities with exact predefined aims would rather be services than artistic work. But the claim that art should be something higher, something more precious or abstracted, should be avoided; rather we should state that it is something entirely different. Art is always called upon to engage with its conditions and cannot settle for the implementation of specified requirements.

Challenges to the Avantgarde

All this by no means implies that computer-aided approaches for algorithmization and automatization of compositional activities were artistically uninteresting on principle. It's rather about coping as a composer with these possibilities on a fundamental level, before integrating them as magical tools into everyday activity otherwise unchanged. With that, there is no contest between "real" art and AI to be heralded. It is instead about making them more fruitful for each other, precisely by confronting technical-economical optimization strategies with artistic, hence political, aims. Art always also means defiance and self-asserted independence from established role ascriptions and (musical) conventions. The compositional research work of musical avantgardes cannot limit itself to the expansion of sonic space or musical material. Its aim has to be to develop a constantly evolving understanding of musical, social possibilities within the equally ever-changing techno-political environments. Machines, whether made of soft- or hardware are — even if the marketing departments of the companies keep harping on terms like "self-learning" and "autonomous" — made, constructed and operated by humans with specific interests. This is why a discussion of these technologies can only be meaningful in a wider economical-political context and it is consequently not enough to review the output of AI composers on a purely aesthetic level (e.g., "are the chord progressions convincing?").

Composing of and composing in magical worlds

With the complexity of musical instruments and compositional tools, on the one hand the musical possibilities are expanding, but on the other hand so are the number and power of preliminary decisions that are being made in their conception and delivered with these tools. Even the contemporary softwares for music production that are not yet advertised with AI buzzwords have reached a level of complexity that is hard to master. To keep these programs operable, the view is directed, and users are guided along designed interfaces. Virtual theater props and stage elements from the metaphorical repository of "music" are digitally shifted to keep the view on the intended surface.

Every interaction with software always implies interactions with the engineers who dynamically provide an interface, a playground, and whose assumptions and preconceptions about compositional work characterize the possibilities of the tools in a fundamental way. Within the explicit and implicit templates, the customer can certainly be creative. They have it nice and easy, as long as they perceive music the same way the "industry" does. This is not just the case with software-based implements, but is part of the idea of tool and instrument manufacturing. The piano, Western music theory turned into an apparatus, is characterized by preconceptions about what music should be and solidifies these notions for further generations. Compositions for piano are *qua definitionem* almost always in equal temperament and forgo vibrato and glissandi. Software-based instruments are lacking the physical restrictions of the piano (and of all other traditional instruments), but shape, if commercially successful and widespread, at least as much the conceptual spaces of the artists that are growing up and working with them. We are using and trusting machines every day, without an understanding of their functionalities. (Semi-) automatic composition programs are about to introduce this return to magical worlds also into artists' ateliers and studios. One hopes, swipes, iterates and chooses from suggestions that have appeared in inexplicable ways. We interact with "superordinate" or "basal" secret rules, which we hardly dare to claim influence over. We act supported by and actually in the service of algorithms and rules of the companies who provided us with these tools. Following some of these orders — neither made, nor understood, but invariably already preauthorized by us — seems as a quasi-mystical practice in a data-capitalistic context.

The poetic act in the mass of data

The sheer masses of recordings, those traces of human music making, require automated ploughing through the digital shadows of a sonic chaos, which often was originally created as an expression of the purest of hearts. The poetic act and the musical moment may easily appear in this context, as if they were mere instances of formal classes in the sea of data references, as if the concrete act were deemed secondary to the abstract order. The artwork finds itself at the position of a dataset, classified on the basis of its role in societal practices.

Art, however, happens open-ended and those pursuing it won't know beforehand, what it is that they are doing. The concrete sound, the concrete act in the totality of its relations is not describable in formulae, nor is it repeatable. This remains a valid statement, despite the potential of every sound nowadays to be measured, classified and repeated ad libitum lays ground to the possibility of informing storage media automatically in a similar fashion.

Unberechenbarkeit + Sinnfreiheit

Art is the place where the implicit aspects of every-day life can be parenthesized consciously, cropping and thematizing them. The artistic act as a jump out of self-evidence remains beyond formalization and is — carried by individual anarchism — at the same time an act against the stereotyping and the vanishing of the concrete, the individual in accepted and implicitly supported ontologies and hierarchies. It can open spaces of possibilities outside established practices, which are nowadays often already molded in rules executable and controllable by machines. 'Sinnfreiheit' is a wordplay based on the homonymy of the words for meaning and perception (*Sinn*) in German as well as the strange relationship between freedom to create meaning and the freedom from (i.e. lack of) defined meaning. This liberation from the imperatives of personal and societal habits and norms has always come at the price of confronting fundamental absurdities, where the included freedom to create (new) sense on one's own may appear as a cold

7 | I suppose that in these optimization loops the suppository or the cavity dowel will emerge as ideal musical forms.

comfort at first. Every allowance of doubt is at the same time an attack at authorities.
Unberechenbarkeit, which translates literally to 'incomputable' denotes not only unpredictability, but also waywardness, erratic and rogue behavior. In a world of total capture everything remaining or wanting to be unforeseeable hence incalculable becomes problematic ("*does not compute...*").
Regarding the possibilities and demands of AI-aided (self-)optimization, an aesthetic and artistic self-positing that does not merely consist of choosing one of 10 different surfaces provided for the individualization of the big One, becomes more important than ever. Art and music are not only part of the good life, but a method to formulate and answer our questions about the good life, time and time again. Questions about how and in which company we'd like to make music are eminently political.
Contemporary musical reality is in a fundamental way characterized by technology. The localisation in and synchronization of most AI research with the game rules of big capitalism may complicate common accesses between AI and compositional avantgardes, and it is not easy to imagine *big data*, the basic nutrient of every AI, independently from *big business*, yet a mutual discourse is both important and promising.
That data and correlations regarding music are now available to a hitherto unimaginable extent, opens up possibilities to completely new, previously unheard musical practices and means in no way that artists from now on will see the zenith of all artistic realization in the apex of the Gaussian bell curve of standard distribution. Nor is it an obligation to abuse the data and tools of machine learning for the cynical "nudging" of the customers towards a certain consumption or voting behavior. A data-rich approach to musical composition instead offers possibilities for a well-founded critique of existing (artistic) practice with all its implicit preconceptions. People surround themselves with and live in technology, construct realities with constantly renewing strata of synthesized sensory stimuli. AI in the hands of artists opens up a rich field of possibilities for playful questioning and redistribution of authority in the music making community between individual, abstraction and algorithm. Here, AI appears as a protean tool for production and conceptual background for the reflection of novel artistic activity. The discourse of composers with AI cannot exhaust itself in proposals for further optimization of the optimization strategies. It has to deal with the conceptions of music and society underlying the technologies under development.
AI-based and informed compositional techniques and tools therefore won't have their big appearance as ersatz-artist machines, as uber-composers, interpreters and recipients, but will be introduced by artists, companies and official agencies — in currently unknown ways, on various levels, wildly diverse roles and at very different places — into human music-making communities, thereby expanding and questioning them in many ways. What should the employment of "fully-autonomous" ersatz music machines in production and reception be good for anyway?
There is nothing there that could be meaningfully outsourced to automata; because music making (which always includes listening to music) constitutes potentially, if not a sufficient justification, then at least a good excuse for human existence.

Werner Jauk (AT)

What is AI to Music...

The evolution of hedonic nature in rational culture — AI-Pop

COMPUTER-MUSIC: A PIONEER IN AI-CONTINUING "COM-POSITION"

Computer-music was the first media-art to continue the tradition of composing by putting together codes for sounds in the frame of an idealistic ideology of music as a form of "relational thinking" (RIEMANN 1914/15) using a logic set of rules. It first analysed composed music to extract the rules created for it by the genius of music-culture. This is how computer-music first made use of AI to create algorithmic music by enacting the synthesis of a full score. Illiac Suite, composed / programmed on ILLIAC I by Hiller and Isaacson in 1957, is generally agreed to be this kind of early, generative computer-music, serving as a kind of template for participation art as social "Würfelspiele" in that it produced a musical structure through social interactions breaking through the barriers of performance as prescribed between musical (re-)producers and consumers; in something similar to what we call prosuming today.
Although structuring codes is to be seen as work on sound (BOULEZ 1975), this AI-concept affirmed the idea of music as a logical construct; though sound-synthesis to shape sounds directly was had not yet been thought of. It was new experimental aesthetics (BERLYNE 1974) which focused on the hedonic aspect of music that impinged on the idea of structuring it, since it is the dynamics of structure that lead to hedonic sensations. Aesthetics are nothing but explorative behaviour, the "affordance" of the environment regulating bodily interaction with it (GIBSON 1982). Homeostatically speaking, its purpose is to reach a middling level of arousal as pertains to the intensity of stimuli arousing the body. Complexity was understood as (cognitive) intensity described through information-theory (SHANNON 1949), formalizing the dynamics of occurrences by their probability of transition in Markov-chains. Today, this layer is "added" by the knowledge that sound is not so much information about concrete motion, or an index for it, as it is a quality of the intensity of motion. The creation of realities and virtualities, especially convergent ones that integrate the body with its needs by shaping emotional processes into logical, structuring turns; impacts our whole concept of intelligence, and as a consequence, of AI, by skewing them towards evolutionary notions of aurally-controlled B-E-I / body-environment-interactions (GIBSON 1982); the embodiments of which lead to "cognitions" as neural networks formalized as music. This aesthesis also corresponds to a hedonic culture in which, because of its "functional origin", music is dominant as the synthesis of instrumental behaviour and emotional intentionality.

Music: the mediatisation of hedonic interaction

The natural meaning of sound to human life is at the basis of music. To perceive sound means to perceive the arousing dynamics of motion and "react" to them. This, in turn, is formalized in the concept of the sound-gesture. Music is the cultivation of emotional communication where the sound-gesture is instrumentalized and mediatized in different kinds of aesthetic behaviour. The sound-gesture is the impression of sound as motion around the body at the same time that the meaning of this motion to the body, its tension, is expressed in bodily behaviour (JAUK 2014); it communicates by "emotional contagion" (HATFIELD 1994) imitating the bodily motion and by this internalizing the emotion.
Said instrumentalization leads to many "extensions of wo-man's", from clapping with the body to drumming on any resonating material; from the immediate extension of a person's breath at the trombone, to the shaping of sound by behaviour. It is mostly the expressing voice that has the sonic role of playing music through instrumentalized interaction with other humans and creating

collective and collectivizing sound-structures through communication in the process.
Mediatization, however, took playing music to composing it with the invention of notation. The picturing and gridding of the immediate, bodily sound-gesture in a time and frequency-domain enabled the externalisation of implicit knowledge into explicit knowledge. In adherence to idealistic culture, the idea of the "objectivation of the we in polyphony" (ADORNO 1947) appeared, to com-pose the interaction-process between the "tension-relaxation" (SCHENKER 1935) of voices through the "relational thinking" (RIEMANN 1914/15) of codes mediating voices. Though ruled by the function of sound in human life, this line of thinking is culturally overwrought. While the playing of music is closer to the needs of the body, composing it drifted away from the concept of the "Werk" as constructed by the will, later generalized in the building of virtual realities.
While the playing of folk musicis close to the hedonic body, the composition of serious (Western) music is closer to rational thinking in that it finally requires knowledge of notation and its rules in order to compose. In this sense, it is access to media which leads to aesthetic and sociopolitical distinction. To interact bodily, on the other hand, is to communicate, to get together for every-body. To interact through media implicates social and political distinction, and not only in the times of an established bourgeoisie.
Music directed "directed" by the process of "gouvernemetalite" is basically structured through function; the formalization of "mood-management" in ritual and clerical music, as well as in serious music and especially in pop music. The rules of composition are directed to this function, namely, the reception and reaching an emotional goal or, to put it more broadly, of "intentional" consumer behavior.
A biosemiotic approach to research in sound-gesture and music will show that music has had the same bodily function since its mediatization. The degree of mediatization between "signal" and "sign", even in the early days of semiotics (see NÖTH 1990) and especially as pertains to media access, creates different (musical) cultures, different socio-aesthetic lives.

The mediatization of tension: "mood-management" the socio-aesthetic function of music

First by bodily perception, then by oral mediating, social communication processes overcame time (and space) through print media. This was continued by algorithms, extracted from consumer-behavior as a part of a neoliberal hedonic culture; in a process of communication that went further away from the body as it drew closer to symbolic signs, but which must come back to its roots, to the body, again. Since the forties, this process has been formalized in hit-parades. The late fifties dealt in big data studies analysing behavior to get knowledge about the relation between consumption and product. This, in turn, led to searching for the algorithms behind musical behavior, in an effort. Once again, this process was not restricted to twentieth century, it has simply become more and more individualized. What was once dictated by autocratic leadership, supressing the needs of the body, becomes a homoeostatic process of self-regulation process set into motion by the optimization of consumption-behavior, by the use of the body's needs. What was criticized as mass-seduction by rational, bourgeois thinking can finally be seen as the continued democratization of autocratic processes and as humanizing life — provided the control of data is not monopolized.
The analysis of consumption-behavior is the analysis of intentional behavior; that is, the analysis of hedonic interaction with the "images" of products. Since music is the formalized intentionality of behavioral analysis, its close to such marketing interests: the two are economic and aesthetic behaviors close to the body, and they merge.
Music is not just a dominant part of this hedonic communication process, it is practised in the same way as consuming "images". Behaving musically is doing music in social interaction by searching for sound, "handling" it and sharing it. Isn't this kind of natural, intelligent interaction creating "true" folk-music, a synthesis of art and life?
Based on theories of musical production as well as consumption-behavior as mood-management, AI-based music-life goes from consumption to production (NAKAJIMA 2012) of/for every body (JAUK 2014a).

Before digitalization, marketing used previous consumer-behaviour to analyse consumer needs. Until today, this data indicates the active behavior of the here and now. It will be a manner of motion detection, which enables the immediate observation of hedonic musical behaviour through by media close to the body, noting signals of bodily activation (JAUK 2014a).
The kind of media-technology that's closer to the body and that is available to every body at once supports a "new amateurism" that will bring us closer to a democratic life. Prosuming was but one step. AI is a tool to optimize marketing strategies, with a long tradition in managing moods as well as in composing algorithmic music. Our purpose is to overcome ideologies and merge both fields of social life.

AI-based prosuming music: AI-Pop

Today, it is not only buying music, but searching for it, that creates data about preferences. Such mood-management has social implications (HARGREAVES 1999) in that it creates music by and for consumption, as part of business (TOFFLER 1980). Today, a digitally native generation "uses" samples of music, modulating them in emotional situations, sharing them through smart mobile devices, creating a ceaseless dynamic of sound-streams. But these persons don't stop to think about whether what they are doing constitutes musical behavior, and are likely not aware that they are making music. It is however an important question for culture: why shouldn´t we call it music?
We have to remember that music formalizes emotional interaction by creating collective and collectivizing sound. The avant-garde of media-as-communication-art is implicitly referred to in the systematic basis of its origin: music is the formalization of hedonic, sonic, performative interaction, and managing moods in these socially interactive settings is what became culture, whether trainted on the glory of God or in overcoming emotions of sadness.
It was net art which used music to explore collective and collectivizing generation (KERCKHOVE 1995). In alignment with the nineties' perception of net art as a collective and collectivizing interaction of humans extended into a "sound fetish" (JAUK 2003), it led to extracting algorithms using the computer as a supervising tool in such a way that their formalization came to adopt its social and aesthetic forms by interacting emotionally with them from the "outside"[1].
Using music was an implicit going "forward back" to what music ever was and will be, the managing of moods by sharing sounds in mostly social situations. No other art is this close to social situations; "beyond semiotics", music is the less semiotic form of information-transferring, and the most bodily and emotional communicating art (JAUK 2013).
It was the avant-garde in the fine arts that integrated the body "as medium" by establishing body-art, performance art and action painting to indicate dynamic expressive behavior[2]. These returns to the body, especially performance art, follow the template of musical behavior -even when they're unaware of it.
Fine art, especially, took its creative specificity from auditory interaction in its return to body-culture, because of dynamization and digitization, and on account of the transgression of the mechanistic paradigm and the mechanic body and their replacement with a more hedonic counterpart. Formalizing dynamics through codes became as paradigmatic to digital culture as hedonism became to communication culture, finally integrating the hedonic body to post-digital culture. As a bacon for communication art, the role of music is to transfer the every-day-communication processes of a communication culture by using new media technologies extending the hedonic body.
We must also analyse not just data indicating intentional behaviour, but whether it is possible to capture the tension of bodily motion directly.

1 | This would involve participants creating a sound by means of a visual interaction typical to the person. They would then specify their communicative behaviour by choosing to interact with similar or opposite persons, sending their personal sound (as a fetish) into the multiple communication processes the sound adopts because of interacting with similar sounds, each affirming its own emotional qualities, or by doing so with different sounds, with diverse qualities. Participants could finally hear the mutation of their sound whenever they wanted to, and see some kind of mapping where their sound fetish will be dynamically and socially located after a year, worldwide.
2 | e.g. see the Körper-Übermalungen of A. Rainer.

Mobile devices enable us to capture not only bodily movements, but the very motion of the body. Motion-capturing systems can be integrated into environments to do just this. Concerning the concept of sound-gesture: motion and sound-perception, as well as sound-generation and its communicative function, become data, the analysis of which brings music "forward back" to its origin. It extracts, then formalizes, it in behaviour which has been basic to music since its inception. Bodily motion in interaction with physical and social environments — even virtual ones — creates music directly: it is "cultivated" in the stomping of people, by the "Schuhplattler", in "clapping music" — again, to do music and to "dance" are not split any more.

The sixties flagship of freedom through hedonism in the "bodily we" became a kind of individualism through a mediated we. AI-based hedonic culture can be seen as a backlash to an early childhood of autistic, hedonic behaviour while being surrounded by similar individuals, an "objectivation of the I" within others satisfying their own needs by "using" each other as products; as "de-personalized" samples of life, living in a hedonic DIY-culture.

AI is based on algorithms analysing data; it is the "degree" of mediatization away from the body, which is the gap between the implicit and explicit knowledge of auditory perception as formalized in music. While a distinctive culture is removed from the body and closer to rational understanding (with a cognitive style that's based on sight and its embodiment), a folkish culture is closer to the (needs of the) body and the hedonic experience (with a cognitive style based more closely on the older, phylogenetic sensory control of B-E-I, that is, closer to hearing.)

Maybe the purpose of music is to manage life. It is not naturally necessary for us to paint, nor to write poems, but maybe it's necessary for us to manage the bodily-basis of moods. To "play" with sounds is to train ourselves in reaching homoeostatic levels of arousal (even in the human interaction of living together). From the point of view of biosemiotics, the meaning of music is based on the natural, explorative behavior to survive.

In describing redundancy-aggregates as clusters of "information" via information-theory (SHANNON 1949), new experimental aesthetics (BERLYNE 1974) was on the way to extract abstract meanings from the behavioral data of music structures; where the meaning is the structure's arousal, as theoretically premised on the evolutionary theory of explorative behavior.

It is the theoretical background of algorithmic computer-music and the theoretical background of aesthetic behavior as hedonic behavior in an economy-based hedonic culture that brings both worlds together: the cultivation of hedonic life through aesthetics, and that of everyday economic life. Respecting the bodily shaping of sound more in the manner of instrumental behavior, however, the folkish aspects to music-making through the handling of sound will lead im-mediately to a clash between musical cultures. This cultural clash is lived even in new music splitting modern avant-gardists, who perpetuate the idea of controlling cultural life and its progress by ratio, formalized in music, from postmodern musicians living with ideas of "use", where e.g. samples are less used to refer to their meaning than as cultural signs, composing cultural re-contextualisation, though through their sound (DIEDERICHSEN 1996), that is, through the hedonic qualities moving the body.

It is not about playing with the cultural meanings of sound, the media of people's distinction, but with their bodily functions so as to create an individualized music for every body in a culture of individualized plurality. Remember that notation, which is a distinctive media, was associated with the establishment of a bourgeoisie. What was political progress then can be considered a step back if one follows the ideology of equality for all, and integrating arts to life. A primitive and even a "barbaric" aspect of the avant-garde is its proximity to that what American theorists (inspired on American pragmatism) criticised when Beuys[3] postulated art and life, but lived this postulation within a traditional art-life. These ideologies can be traced to differing degrees of mediatization, with closeness to the body becoming politically instrumentalized. While signs representing the B-E-I lead to a thinking, mediated, bodily interaction, it is the immediate bodily interaction, its intentionality, which results in emotional communication. To merely indicate this behavior or be content with its cultural value is to go "forward back" to the immediate use of said behavior's intention, whereas in musical culture or in those of artificial worlds.

Body-music: when nature becomes culture, when AI becomes "emotional"

It is sonic performative behavior, the concept of sound-gesture, which becomes the template for communication as basic cultural process. Sharing and shaping sounds becomes bodily again in creating music by and for every body; not by managing culturally connoted emotions, but in addressing bodily needs through homoeostatic (self-)regulation on a level of arousal that can help create an alternative hedonic culture. Media technology, including concepts of AI extending and formalizing the mechanic body, is aware of how restrictive the mechanical is. This brings music back to its beginnings as a satisfaction of needs for every body, overcoming the idea of cultivation through structuring sounds by thinking, as a formalization of "tension-relaxation"). At the same time, this is a cultural empowerment of music, and of popular music especially.

Popular music embodies its basic sense that the availability of media has to be arranged, any intervention in its equal access is a display of political power. This is not to avoid emotional hearing as ADORNO assumed, or even emotional behavior; it is to avoid the monopolization of access to body-extensions by continuing the process of democratisation through individualization in providing media access to every body. Years ago, the mediation of "information" had to be understood by the people leading revolutions and reformation. Today, it functions as some kind of "signal" that is meant to be picked up by every body.

Music isn't just a dominant part of hedonic life, it is the paradigm for how to live it. Increasingly, AI tries to formalize intelligent behaviour that will integrate emotion: intentionality and rationality merged in intentional B-E-I and its evolutionary power; hearing formalized as music generating convergent realities based on bodily needs.

Serious approaches in evolutionary psychology consider the hedonic life to be more liveable. A dominant part of it is the self-regulation of homoeostatic behaviour, wherein AI becomes the "method" to create hedonic worlds based on data. By organising this data and analysing this kind of music, AI transfers emotionally intelligent regulation into cultural behaviour, producing an aesthetics that is "natural".In so doing, evolutionary processes become a part of an alternative, green concept of culture.

What started with intuitive interfaces, which are restricted to mechanical cognitions and behaviour, is to be extended to the intentionality of behaviour, to the tension "motivating" motion. Through this, the concept of gesture as instrumental behaviour has to be extended by sound-gesture, formalized in music (JAUK 2019). It focuses on how we are doing what we are doing. Research in musical instruments has a long tradition of extending the body by technological devices but these are instruments in the traditional sense, with a focus on virtuosity in playing mechanical sounds; an understanding which affirmed itself with the reproductive-playing of composition, prescribed by notation.

Scientific research is overcoming this musical tradition by becoming interested in the basic "logic" of musical formalization through auditory B-E-I, that is, by formalizing sound-gesture, through social interaction, to create hedonic virtualities.

3 | Following the art concepts of American pragmatism, which was thought of as "kitsch" in old Europe, artistic behavior is not just the aestheticization of everday life, but a lived aesthetic. Although Beuys didn´t talk about the quality of creative behaviour, he behaved like a mythologized star, displaying behavior THWAITES assessed as "gross self-aggrandizement" (see WALTERS 2012, p. 186). Consider that his concept of "soziale Plastik" PLATSCHECK (1984, p. 83) insinuates even selfish purpose, "soziale Verhältnisse nur für seine Zwecke zu instrumentalisieren". Very near this, a culture of selfish behavior was being critically argued for by punk, where "a cheap holiday in other people's misery" served as a metaphor for a life of commercial success of high arousing sensation-media today. It is something we see being brandished today in social media, where the sharing of misery can be used for others to present themselves as "nice".

This changes the value of music in culture. But what is music to an AI-based culture?

Talking about reaching homeostasis as a dynamic stream of arousal in the basic urge to live, it is clear that to speak about "intelligence" is to speak of artificial behavior modelled on layered, neural networks in which "decisions" are looped; changing the "knowledge"-base by weighing their contributions, changing their thresholds, effecting reproduction, mutation, recombination and selection, to finally adopt the whole system dynamically to reach evolutionary algorithms that optimize the behavior of one, for the survival of all. Deep learning changes not only the weight of the parameters, but that of the entire system. And then there's the criterion of "efficiency". Does it correspond to the cultural over-molding of nature in music?

What had not been considered until now arises as a cultural and scientific question. It is of greater interest to discern what music is to AI and the media-arts, in that it brings emotion into intelligence, and the hedonic body into the post-digital world by converting physical and virtual worlds through the needs of the body.

Together with this decline in rational, visual culture; the value of music rises, as does that relating to its integration into media-worlds. Though its absence can be argued from the dominance of "visual-thinking", the fact is music was not affected as the analogous picturing by digitization: it is a cultural product coding the dynamics of sound and composing by putting those codes together, formalizing hearing and, through it, the emotional "intelligence" of communication. Music has, in other words, been concerned with the high transgression of the mechanistic paradigm via dynamization and digitization (JAUK 2009).

For hundreds of years, that coding dynamic occurrences is not new to music is maybe why the first computer-arts were computer-music.

Nevertheless, media close to the body brought music a "forward back" (JAUK 2014b, 2019) future to the immediate bodily shaping of sound; a cultural practice in every folk-culture.

AI is just continuing what started with the coding of sound and the composition of sound-structures. It is not surprising that computer-music was initially AI-based, the analysis of composed music to extract algorithms to compose new music. It is not surprising, either, that this AI-based music ignored any kind of emotional component, and that it was only valued rationally.

Music is the cultivation of hedonic interaction, of intentional B-E-I, of tension because of the "affordance" of the environment leading to the aesthetic as immediately explorative survivalistic behavior.

New experimental aesthetics are the theoretical groundwork of experimental studies showing that middling levels of arousal lead to the highest attraction.

Formalization in music, expressed as notation, is the coding of the sound-gesture, the impression of an imagination of the spatial motion of sound around the body (because of embodied cognitions resulting from the perception of sound), and the immediate behavior expressing the meaning of this motion to the body. Its gridding and mediatization, as code, leads to a (su-)specious "higher" step in culture, wherein notation enabled the composition of the "Werk".

What was tried to be formalized in the "Werk", what was lived in folk-culture, is the basis of music: the rationality of structuring emotions based on bodily behavior. Music is neither intelligent nor emotional; it formalizes the intentionality of instrumental behaviour not as simple adding, but as synthesis. This is what MINSKY argued AI should be: "the question is not whether intelligent machines can have emotions, but whether machines can be intelligent without any emotions" (MINSKY, 1986). In this sense, the ideological aesthetic-dispute within music is an important step towards establishing an auditory culture in which we accept what "knowledge" can be transferred from living music to life in an emotionally intelligent artificial world.

HERE IT STARTS AGAIN: THIS IS WHAT AI IS TO MUSIC;

A RETURN TO ITS OWN CULTURE. IT IS CULTURAL RE-EMPOWERMENT.

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AI and AE — what is music to AI ...

The sonic performative body, a paradigm to live life in post-digital culture

INTRODUCTION

What we see is primarily re-cognized, or "pictured" by the visual system. This percept is compared with other, previous perceptions and culturally coded through language. This is how the presence of experience is re-presented in symbolic signs. Implicit body-knowledge is externalized by codes allowing its communication. Mediatization is how media brings implicit knowledge to explicit knowledge, permitting its cultural manipulation. This formalization process through media is what we know as cultivation.

According to this "empowerment" in being culture, music is considered as the cultivation of the sonic interaction between the body and its environment, a pre-semiotic perception just of qualities of sound. But music is mostly understood through visual criteria, that is, by seeing and cognitive understanding. We consider this intermedial transposition a process of cultivation; a making nature of culture. An intermedial transposition is thus a scientific "bias": we look at hearing, or extract information from what sound expresses.

Finally, through the technological extension of wo-man — which led, in turn, to dynamization and, by virtue of it, to the "stillstand" (VIRILIO, 1992) of the "all-at-onceness" (McLUHAN, 1995); to digitalization and the possibility of creating immaterial worlds — mediatization brought on the transgression of the mechanistic paradigm (JAUK, 2003) associated with a turn from the seeing-body to the auditory-body. It is a turn from a mechanistic body (and its extension, in a mechanistic sense) controlled by understanding, to the non-mechanistic "controlled" by hedonic needs. The dominance of instrumental interactions between body and environment moved towards intentional B-E-I / Body-Environment-Interaction. It is thus the "affordance" of the environment bringing the body in tension to interact (GIBSON, 1982).

The "vision" of a multisensory extension for the body became increasingly urgent. It led to the overcoming of the concept of the "useless body" (BAUDRILLARD, 1981) and the acceptance of "mixed" physical and virtual worlds where one can see that which one cannot bodily enact. The integration of the body in virtual worlds to create "converged" realities followed from this.

While music was the first digital environment to formalize the creation of environments through bodily interaction, its impact was suppressed in the discourse of media-culture by the cultural dominance of seeing and understanding, often implicitly argued for from the perspective of evolutionary progress. Even so, hearing and its formalization through music are now increasingly present in bridging the gap between the human body and virtuality by establishing an alternative hedonic as an auditory culture.

There are many definitions of intelligence, but few approaches to artificial intelligence. "Intelligence is what this test measures" acknowledges its cultural and instrumental use the most. Following the dominance of a rational-visual culture, AI is eminently handled as a generation-process based on analyses of "logical" processes, where behavior is reduced to coded "information" described by probabilities premised on cultural and instrumental values.

This rational, idealistic understanding has since been displaced. Remembering MINSKY (1986), we have to ask again: can intelligence be without emotion? Despite being understood as a logical process of "relational thinking" (RIEMANN, 1914/15) because of the mediatization of "tension-relaxation" (SCHENKER, 1935) in notation, music has become a dominant part of hedonic culture. New media enables music to go "forward back" (JAUK, 2014b) to formalize the hedonic body: sound-gesture, that is to say, the bodily imagination of sound and its meaning to the body, is paradigmatic to post-digital culture, and involves a contemporary cultural "understanding" of intelligence with emotion.

This cultural turn is thus a musical turn — the transgression of a mechanistic paradigm by mediatization within neoliberal post-digital culture.

Often postulated as a decline in 20th century visual culture of (DUBUFFET), it was implicitly fulfilled by a change in music-culture. This can be seen in the shift from the narrative song to the sound-dominance of techno-pop-music understood as "the decline of figure and the rise of ground" (TAGG, 1994) through immersion in "an ocean of sound" (TOOP, 1997).

It was finally Marshall McLUHAN (1995) who overcame the visual paradigm by arguing that electronic space should be "perceived" as auditory space. The "all-at-onceness" of information inverts the process of its acquisition: we no longer go to the information, the information comes to us. It is present in the electronic space and we can just grab it. This is the situation of the net-space. Although we talk about our www-interaction in terms of visual interaction, we conduct ourselves around it an auditory manner by "listening" to information and apprehending it not through rational decision, but because of the "affordance" it provides us with; namely, by virtue of its meaning to the body as excitement. This newer explanation follows the intentional B-E-I proposed by GIBSON (1982), which assumes hedonic values to be the criteria for the attentional behavior of our bodies to environments formed through this: DARWIN's concept of adoption, in brief.

While visual interaction is associated with the mechanistic paradigm as a classical logical process describing motion as a function of energy in time and space, hearing is a more hedonic interaction. And it is digital culture that brought the transgression of the mechanistic paradigm and the shift towards a hedonic paradigm by regulating life in post-digital culture.

Often described as an aesthetics of "failure" on the basis of its own restrictions, this understanding of it should be extended: the failure is to concentrate on the mechanistic body. It was, after all, extension that made an "untouchable", digital world "la fin du corps" (BAUDRILLARD: 1981, 151). This led to the integration of an "alternative" (cultural concept of the) body, the hedonic body in digital "convergence" with material life to create post-digital cultures (JAUK, 2019).

Hearing is thus the dominant, natural base for a hedonic culture; a bodily alternative to the mechanistic body "cultivated" in a neoliberal environment where interaction is neve assumed to be rational. What ADORNO condemned as the "social untrue" is political everyday life today. It was BOHRER (1979) who described this turn, and SCHULZE (2000) who brought this political climate together with music, and with pop-music, specifically. Media-theories and new experimental aesthetics based on evolutionary psychology could be argued as the bases for a musicalized culture (JAUK, 2009), in that they follow the formalizations of hearing after the transgression of the mechanistic paradigm through mediatization and the dynamization of the body-environment interaction (effectively, the shift from digital to post-digital-culture).

This cultural turn revolutionized the concept "perception" by finally extending the cognitive model of information-processing to an intentional body-environment-interaction; an arousal-based bodily behavior resulting in specific, embodied "cognitions". And because of the sensory "control" implied therein, this is also puts a spin on what "intelligence" may be.

Synthesizing is a cognition based on embodiments of bodily control through visual B-E-I synthesizing pictures of the world. Mechanistic understanding is to synthesize new worlds based on the understanding of the existing one through rational processes, by the setting physical parameters that relate to the environment, formalized as geometry to reach innovation in a modern sense.
Hearing is closer to an analytic process of dynamic behavior, of motion, around the body being grabbed by their affordances. It's an intensity, and in its tension is its meaning to reach an homoeostatic activation the primal goal of which is to survive. Creation is more a putting together of existing tension-relaxation motions in the bodily domain, within the context-variation of its cognitive counterpart. It is cultivated in the frame of a more postmodern "understanding" of plurality and diversity.
Composition is an artefact of the medial transposition of sound to the visual domain and its coding. Taken to the extreme, the music resulting from this was adequate to understand its relational thinking, hearing sound was "social untrue" by being political seductive.
Two aesthetic worlds clash with each other today, spurred by the continuation of the idea of composition, the putting-together sounds by media-technologies driven by algorithmic "rules". Creating serious music remains new to music until today. "Doing music," that is, to live music bodily by handling and shaping sound through motion and shaking the body to sound is considered to be stupid pop.
The function of music for managing moods as used from clerical to pop and folk-music has been culturally forgotten.
Finally the *semper et ubique* availability of sound and tools to handle it bodily allow the "forward back" (JAUK, 2014b) movement of this basically human bodily shaping of sounds to b grabbed from the dynamic "sound-base" of the www. This new amateurism of popular music in its purest sense is near the origin of music in the interplay between the bodily tension which produces sound (and that communicates this very tension); leading to a common dynamic of individual bodies, in their current situations, living with the affordances provided to them by environmental stimuli.

While these paradigm shifts in media are primarily argued by mechanic, technological extensions of the material body; behavioral intentionality as the driving force behind them is underrated.
With the appearance of a new experimental aesthetics (BERLYNE, 1974) working on the coding of emotional behavior through information-theory and computer-generated music, AI research has been trying to integrate emotional behavior into communicative processes. It increasingly accepts that the decisions taken in a process of information "reduction" are not rational or classically "intelligent" but more "emotional", and so it helps to weigh these parameters of information through their bodily "intensity".
This is where finally music comes in. As the formalization of hearing through its meaning to the body, it is a form of arousal. It is also the concept sound-gesture which formalizes the imagination of motion and the expression of its bodily meaning. It is "cultivated" in the "Ursatz" of serious Western music as "form" (SCHENKER, 1935), but is lived bodily in popular music as "tension-relaxation".

The logic of seeing things in front of the body — its immersion into the dynamics of sound

What are the great differences between seeing and hearing (JAUK, 2000)? Seeing is picturing a sight of things within a psychological moment (what German iconically terms "Augenblick") in front of the body, wherein they're re-cognized by an information-processing system, "in ratio" to each other. Because we produce "pictures" through bodily motion, seeing is associated to a "synthesizing" reality. Hearing, on the other hand, is a more phylogenetically ancient kind of perception in which sound, being motion all around a body, is analyzed because it triggers an im-mediate bodily behavior; one that's re-cognized on a conscious level even with a large delay. Hearing is, primarily, perceiving intensities as signals (relating to a concept of intentionality of B-E-I the extremity of which we know as "pain"). Making music as a formalization of the sonic performative body is a paradigm of hedonic interaction and this creation of environments is respectful of the body's needs.
Sound is nothing but an artifact of motion around the body. Despite visual perception, we primarily perceive abstract sounds. While the coding process for visual perception leads us to assume cognitive decisions, auditory perception is more stimulating of behavior based on implicit knowledge and known as the "tacit dimension" (POLANYI, 1966). The mere sensory qualities of sound provoke the body's activation, with the sound of motion being perceived im-mediately as e-motion in order for the body to "survive".
Specific approaches adjacent to biosemiotics are concerned with the formation of "meaning" from physiological processes. For this field, the study of hearing and functional sounds will be a fruitful research area.
Hearing "meanings" is a bodily feeling of activity because of the "affordances" of motion. It is more a process "beyond semiotics" (JAUK, 2013). Even semiologists have described the existence of signals . LANGER (1953), for example, called musical form the presentative sign of feeling.
When linguists talk about what the first what humans experienced as "significants" (WIDMER 2007), it is to interpret a visual approach to the cultural world:
What we first experience in B-E-I are embodiments which lead to cognitions, from the logical orders we call causality because of the experience of "shocks and pushes" (LEVY, 2000) to the cultural meanings of (symbolic) signs.
Despite the understanding of the re-presentation of the presence, we perceive the presence: the meaning of the motion around us is the meaning to the body, which behaves to survive.
While the verbalization in symbolic signs lets us understand the environment to behave, sound leads closer to the implicit knowledge associated with intuitive behavior following the needs of the body (which can be thought about later.)
The logic of seeing was mapped to the hedonics of hearing. This intermodal/medial transposition is called Western culture.
When HEIDEGGER (2003) argues that we don´t perceive just a sound, but hear the door falling into the lock, his argumentation is based on a visual understanding of perception. Studies (CARAMIAUX 2002) show that we hear abstract sensory qualities and not concrete information being coded as explicit knowledge. In short, we don´t recognize an index for a certain motion; rather, we get implicit knowledge of "motion" as intuitive behavior intentionally triggering our B-E-I, setting the body in motion expressing emotion.
The formalization of hearing in Western music culture is based on a visual intermedial transposition. The imagination of sound and the meaning of this motion to the body, today described by the concept of "sound-gesture" is pictured as "neuma"; its gridding in a time-and frequency-domain resulting in "notation" representing the physical, visual imagination of motion by numerical codes within geometrical thinking. This allows to com-pose codes for sounds into musical structures: the "Werk". Through this intermedial transposition and its coding, the perception of tension-relaxation of sounds turned to the visual domain and to its understanding of "relational thinking" (which was culturally used as a means of empowerment, as well as a social / political distinction of the bourgeoisie).
Auditory interaction had to be revived. It was culturally masked by the logic of visual understanding; hearing was understood through the experience / embodied cognitions of seeing.
Sound-gesture describes the fusion of the mechanistic-visual and hedonic-auditory worlds: it is the impression of the imagination of embodied because the experience of physical sound-modulations during the propagation of sound and a conceptual metaphor (LAKOFF, 1980) and the transposition of the concept's gravity into sound does not underlay the gravity in our perception motion, and the expression of the "meaning" of this motion to the body, causes an immediate and mediated sound-production and expression of the e-motion, that is, of the arousal of the body. The impression of motion and the expression of motion are of sonic performative quality; its basic sonic quality being "sharpness", its basic bodily quality, "activity".
This paradigm of a hedonic interaction can hardly be reduced to the concept of information-transfer, it has more to do with "handling" as a bodily communication process, a becoming "communis".
A common turn towards a body-culture and to the transgression of the mechanistic paradigm dominated by seeing is thus affirmed by the "forward back" turn to the earlier phylogenetic dominance of hearing, and is on the way to establish an "auditory culture".

Hedonic interaction and the generation of artificial intelligent realities

While AI is based on an information processing-model where new knowledge is generated by extracting patterns from (behavioral) information premised on knowledge representing the structures of previous experiences interacting in a dynamic feedback-process, AE is based on the intentionality of the body's behavior as indicative of the dynamics of activation and the human and social contexts of these communication processes and material environment".
Psychological and anthropological research focuses on the visual representation of emotion by "looking at" facial expressions and understanding its cultural coding in (evaluative) verbal terms describing universal categories of emotion. Musicological oriented research focuses on bodily behavior expressing the intentionality; felt as the "activity" of a dimensional concept of emotion in which any kind of feeling is nonverbally "placed" in the "semantic space" (OSGOOD, 1957).
Although used as shortcut text-emoticon in everyday life, the iconic representation of human facial expressions within verbal contexts seems to be culturally connoted and less "universal" (RACHAEL, 2012) than the more phylogenetically ancient intentionality of the body, its tension. Mapping facial expressions to humanize things focuses on "obvious" visual interaction and an unnatural transposition. Despite this, emotion-cartooning bestowing intentionality on instrumental behavior is perceived to be more natural: experiments show the greater contentment of persons working with this kind of humanized robot. Adding intentionality to instrumental behavior lends emotion to motion, even that of robots. This is the concept of sound-gesture which, with its fruitful approach to artificial emotion and via its integration into AI, respects the body's needs in dominating a hedonic culture.
This behavioral dimension to emotion is close to hedonic interaction insofar as it's in-tented by bodily "tension", which gives "meaning" to these dynamic processes as it has ever since musical interaction became one of the communication-arts.
Through polyphony, it was "objectivated" in the (expressive) interaction of the "voices of the we" (ADORNO, 1958), where notation enabled composition as a dynamic process of communication by the imagination of the interacting bodies, in tension, coding their voices. The idea of an "absolute music", which came up with the structuring of codes (re-presenting sounds) came to interrupt this hedonic body-culture. But the alternative idea of a natural basis for cultural communication didn´t get lost. "Interaction" was an everyday term in the folk and jazz scenes of the sixties (KNAUER, 1996) before it was ever used in the media-arts, and long after it was reduced to a mechanical concept reaction, instead of a communicational concept interaction (JAUK, 1995). It is based foremostly on interaction in psychological groups (BALES, 1950), where informal interaction is immediate bodily communication through nonverbal behavior, which has collective and collectivizing power. Net-art and communication-art, for instance were defined by this (KERCKHOVE, 1995) "intuitively".
From the Enlightenment to Idealism, the generation of reality was a rational process. We assume that material, natural processes are systemic and self-regulating, built around a homoeostatic base; even if most human cultural processes are finally controlled by emotional decisions. What we call emotion is another cultural construction, where the power of bodily in-tension is behind decisions founded on the natural "desire" for homoeostatic states, that is, levels of activation of a liveable amount. This is regulated by behavior stimulated by the affordances in of the environment, and it is the quality of stimuli that will determine the evaluation, and the final potency, of an activity. Cognitive valuation is but a part of the process of integrating the bodily sensation to cultural norms.
A hedonic culture is based on this kind of emotional interaction. Such emotions shape attitudes more than rational thinking. Cultural behavior, whether aesthetic or political, on a mass or social scale —especially with music — is primarily based on attitudes. This intimate homoeostatic behavior is susceptible to control by rational thinking than the other way round: a rational concept comes nearer to representing the "thinking about" the presence of emotional interactions as a cognitive interpretation of a "decision" made after the "bodily" action was done. But how can this emotional quality be detected? Tension is the natural basis for music: bodily tension produces sound as motion; its reception brings the body in tension and motion; the sound-gesture "contains" the "information" of this body-sound-relation through bodily tension; and capturing this intentionality in an instrumental behavior will capture emotional qualities of interaction by converging the intentional and the instrumental towards creating culture and environments.
This conversion includes a shift from information to communication, from the stable repetition-state of mechanic interaction to an evolutionary concept of the dynamics by adoption. Any single intentional B-E-I adopts the body and the environment by homoestasis; it adopts the concept of music and intelligence. Concepts of intelligent behavior have to become close to concepts of evolutionary intelligence, the dynamics of neural networks has to become integrated into evolutionary concepts explored by evolutionary psychology formalized in evolutionary algorithms.
Although concepts of Artificial Neural Network are close to (cognitive) concepts of information processing, it is adoption enriching the concept of AI, it will be the turn from "information" to "meaning to the body", which will shift information to communication integrating emotion into intelligence. The concept of neural network becomes role model of adopting intelligence based on a dynamic system of layered nodes where "decisions" are feedback-looped. These feedbacks change the "knowledge"-base by weighting their contribution, changing their thresholds, effecting reproduction, mutation, recombination and selection, finally adopting the whole system dynamically, optimizing behavior of one to survive for all. This dynamic means to reach its formalization in evolutionary algorithms. Deep learning changes not only the weight of parameters but the whole system, finally the criteria of the evaluation of its "efficiency" — is it the externalisation of cultural over-molding of nature in music? AE becomes the meaning of artificial emotion integrating concepts of evolutionary algorithm.

What is hedonic interaction, what is music to AI?

In the early days of AI, Marvin MINSKY argued, that "the question is not whether intelligent machines can have emotions, but whether machines can be intelligent without any emotions" (MINSKY, 1986). In a society of the mind, based on a culture of seeing, semiological interpretation and cognition dominated even models for the study of emotions. Looking "forward back", mankind *besinnt sich* more and more on its development and, through this, of its grounding. It's worth considering emotion is not just a product of the cognitive assessment of a situation that the body is in; but that it's first of all, a bodily perception and an immediate, intentionally triggered behavior to be cognitively evaluated "afterwards" (MATURANA, 1987).
To play music is a paradigm of a process of emotional decision-making within instrumental behavior to "create" culture.
There is implicit knowledge in this intentional process. Although its nature is a power to survive, rational culture suppressed it. Music is the formalization of this body knowledge of hedonic interaction (JAUK, 2018). But formalizing did not so much lead to an explicit knowledge of emotional interaction, as it shifted emotion to a cognitive understanding, affirmed by the intermedial transposition coding of the bodily process in notation valued as a cultural process. Formalizing "tension-relaxation" was reduced to "relational thinking".
As with music, the emotional part of intelligence, too, is more or less "rationalized" to a cognitive understanding. Artificial intelligence is based on the extraction of qualities indicated by data. Any extraction can only achieve what is already encoded in the data. The more the data refers to symbolic representation or culturally affirmed terms, the more the data is removed from the dominant dimensions of emotions (and the less the extracted algorithm will be valid as an algorithm meant to generate emotions as a part of B-E-I.)
It is not about to indicate emotion by associated data (as it is done by studying, for instance, consumer behavior) by not representing the specifics of the interaction of the intentional

and instrumental part of B-E-I: it is to detect the intentionality of B-E-I. Nor is it to code emotion by transposing it into another mode to reach explicit knowledge, but to accept implicit knowledge is knowledge; perhaps even the most important knowledge to survive.
It is the immediate capture of intentionality, the being-in-tension because of a stimulus in the environment, which immediately expresses its (adoptive) behavior. It is the concept of sound-gesture that immediately expresses the meaning of motions to the body, because it is part of the intentional B-E-I of the affordance of motion around the body. To analyze this kind of data is to analyze the dimensional activity of emotion. It could be done by motion tracking complemented with physiological and psychological data.
Nonverbal sound-gesture research yielded many results describing the dynamics of spatial motion in the upper body and their correlation to the emotional dimensions and spatial imagination of sound-movement.
Compared to the criteria of universal emotions, gestural expression shows some kind of excluding validity in that it shows what they cannot be (BEHNE, 1982). It is the dominance of the "activity" which shows the tension in its independency of evaluation. This, in turn, shows if the quality of the emotion is pleasing or unpleasing. Experimental results show a high probability of confusion for the recognition of the quality of the expression of high activity; not distinguishing positive from negative evaluation even if, to detect the activity, sound-gesture is a valid physiological and psychological behavior. Its temporal dynamic is related to the temporal specifics of tension-relaxation.
The temporal repetition of sound-gestures is formalized as music. The dynamics in frequency and amplitude perceived as dynamics of "sharpness" (BISMARCK, 1974) cause "acoustic driving effects" (HARRER, 1975) formalized as dance. All of them are immediately "produced" by the tension of the body, which is generally immediate bodily behavior through which to analyze tension as the intentionality of B-E-I.
While our mechanistic understanding focuses more on the mathematics of extraction-processes, it is just as important take care of the quality of data to achieve algorithms capable of generating artificial behavior that can be perceived as emotionally communicating bodily tension through "emotional contagion" (HATFIELD, 1994) by imitation of a motion's internalization of emotion. This theory is parallel to the concept of sound-gesture, in which the perception of motion is lent bodily expression as emotion, thus starting the process of contagion.
Intelligence is more closely related to "zweckrational" instrumental behavior, which tends to be efficient in a variety of ways. Emotion is more nearly related to homoeostatic behavior, playing with tension to reach a preferred mid-level arousal. Though new experimental aesthetics describes and explains precognitive attentional behavior as being basically explorative; this does not mean that culturally based expectations or deviations can't be sources for activation. But it is the quality of the stimuli "beyond semiotics" that will set it into motion.
Studies in new experimental aesthetics explored this behavior with relation to the stimuli affordance by indicating their intensity in order of complexity (as compared to previous experiences), which were later formalized in aggregates through information theory. It was finally the length of Markov chains reaching for maximum redundancy that caused arousal: the shorter the information-aggregate, the more complex a structure is; the more information in a structure, the easier it will be to predict, because uncertainty leads to arousal. The development of music through notation shows a tendency towards becoming more complex (JAUK, 1982).
The dimensional concept helps "reduce" the categorical emotion to an intentional aspect of instrumental behavior: it is the activity invited by the affordance of a situation. At first this affordance is given just by its intensity, and only later would it be cognitively evaluated on situational and internalized cultural norms. This cognitive extension of the new experimental aesthetics explains the rise of "activity" as well (KONECNI, 1977).
Mobile device — in the sense of instruments detecting motion and the motion of e-motion — place the dynamics of activation within the body. They can very economically provide "information" about how we are doing what we are doing (JAUK, 2014: a,b), with studies showing that 3-point detection of the upper body is enough to capture the activity as tension forcing e-motion through motion.
If music is a process of mediatization of bodily tension, then motion-detection falls into this manner of mediatization, which immediately detects tension. It's a media-technology that's not only close to the body, but for the body, for every body.
If epistemological media art aims to explore the implications of reality-imaginations on the extension of the body, then it's an experimental setting within real-life situations outside labor. This is what the study of "media" close to the body needs, the kind of data that doesn't only re-present intentional behavior, but is the presence of intentional behavior that can be analyzed to draw emotionally intelligent algorithms from it.
Music is a plural model for enriching AI with emotion. Based on the formalization of sound-gesture, music is the paradigm for how to code emotion. It is also a "model" for how not to fall into an existence independent of the media, which is what led to the intermedial transposition of music from the feeling of sound to the understanding of codes. This shift is to be avoided. Today, it is media near the body and detecting signals of hedonic interaction that is toppling the cultural dominance of rationality.

Closer to the body. When signals become media: from the formalization of the body´s geometric view to the immediate "use" of an implicit knowledge of the body

Computer-music was the first "new" media-art capable of analyzing compositions to extract patterns, formalized as algorithms, from which to generate more music made by a computer. This is the basic paradigm of AI.
But it was information theory (SHANNON, 1949) which provided the mathematical method to analyze and generate structures to formalize hearing and its cultivation through music; the structuring following bodily activation (felt as "activity") of aesthetic processes in time.
Big data studies analyzing information aggregates and structural generation were wrapped up with extracted algorithms as a part of late-fifties computer-culture. However, this kind of AI-generated computer music followed the mechanistic understanding of algorithmic composition; their analyses even ignored that music could be the formalization of tension-processes in communication.
It was the psychobiology of new experimental aesthetics (BERLYNE, 1974), which defined aesthetic behavior as explorative and based on activity, that raised the affordance of stimuli to the body. According to the psychological approach to music as the formalization of hearing, musical structure indicates bodily activation (felt as "activity"); analyses of music get knowledge about the coding of tension as an aesthetic process in time.
Today, it is the analyses of bodily behavior, and not as an indicator of motion but as a moving part of emotion felt as a communicative "activity", that allows the capture of e-motion through technologies developed around the concept "sound-gesture". Sound-gesture is understood as the imagination of motion around the body and the expression of the meaning of this motion to the body through bodily motion; it is, in other words, what's instrumentalized and mediatized in music.
It depends on the media, on its availability, on what kind of emotion is communicated. In terms of scientific communication, we must consider the intermedial transposition from presence to re-presence as externalization and, in a certain way, as an objectivation of emotion. On the other hand, it is a medial "bias" turning a natural presence into a cultural norm.
It was new experimental aesthetics that provided the theoretical basis for art being structured and perceived as a feeling of tension, as activity, by defining aesthetic behavior as explorative behavior. At the same time, this research tried to capture series of emotional decisions through the use information-theory.
It is motion-detection technology and its availability to us in everyday life, though, which enables to communicate the intentional behavior of the body and the sounds it's correlated with: again, the presence of the impression and expression of said "tension" as sound-gesture.
Culture is no longer restricted to communicate e-motions through picturing, coding and describing their meaning as cultural "good". It is now possible to communicate this meaning as the reception of sonic performative behavior with

our body immediately. In this way, scientific communication goes beyond cultural "correction" as a bias for "culture". In an experimental setting, it allows us to observe even the cultural bias. This means this method of observation and communication is an epistemological one that doesn't just transcend cultural processes, but makes them obvious. Hence its powerful meaning as artifact or as an instrumental part of *gouvernementalite*.

From the perspective of the cultural sciences, it is not a naive backslash to natural culture. Rather, it makes it immediately worthy of study and communicates the powerful methods *gouvernementalite* has used since the onset of media-technologies: immediate activation to load up words with "emotional" meanings; emotional sensations conveyed by the bodily expression of emotion in sound and in gesture. Sound-gesture describes this expressive mediatization of presence as emotional contagion and explores its immediate bodily communication.

What cultural science has described, mostly within the frame of powerful-ideologies, is what can be relativized by methods of *discourse*, to be controlled experimentally.

Cultural studies explore this natural behavior as applied to cultural processes. The concept of sound-gesture, which perceives motion and expresses its emotion, and the theory of "emotional contagion" (HATFIELD, 1994) which communicates bodily emotion through the imitation of motion to, through it, show the natural basis for cultural meanings could be ultimately signed and named, and so adapted to a cultural understanding.

Sonic performative behavior is the paradigm for not just non-instrumental mechanic interaction and "isolated" hedonic interaction, but for the conversion of intentional and instrumental behavior. It is, primarily, to "understand" beyond semiotics (JAUK, 2013); a pre-cognitive interaction cued by signals and by the intensity of stimuli, e-motion in its purest sense as activation qua bodily behavior, as motion and emotion all at once.

What started with intuitive interfaces and communication art is what epistemological media-art explores today. Despite transferring information, intentional B-E-I signals to interpersonal and nonverbal communication; potentially on a mass scale, and soon to take place with machines.

One may finally argue that, following the concept of creation through analysis, AI won't be able to create a new world. We have to overcome progressive modern ways of thinking; to accept linear models of rational progress by way of non-rational processes. We increasingly have to accept that human cultures structure themselves around the hedonic needs of the body; that the homoeostatic force is what adopts a rational behavior to effect the tenable dynamic we call life.

What started with intuitive interfaces and communication art is what epistemological media-art explores today: a humanized conversion of worlds physical and virtual, based on an intelligence respecting the needs of the body. It's a concept of AI in which the notions of intentional emotion and mechanic rational behavior can converge.

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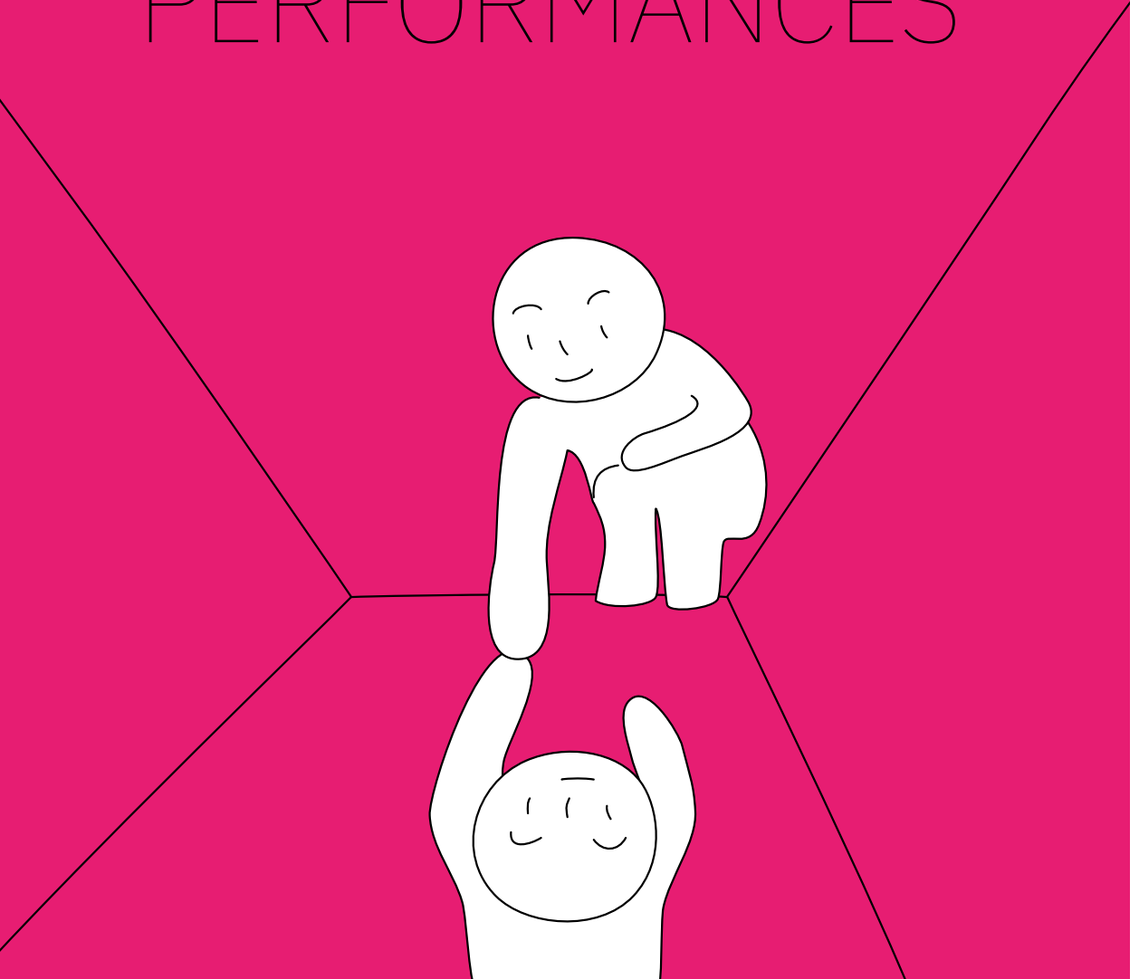
EVENTS, CONCERTS & PERFORMANCES



Opening

As every year, we will open the first evening of the festival with an exciting performance program. The focus will be on the various artistic possibilities offered by the voice, improvisation, and neural networks in humans and machines. Under the title **"Voices from AI in Experimental Improvisation," Tomomi Adachi** will present an AI that has mastered his voice and his musical improvisation style. The collaboration of **Reeps One ft. Secondself**, on the other hand, is aimed at combining the machine learning of AI with beatboxing to create a new artistic tool. For her piece **"Ultrachunk," Jennifer Walshe** recorded solo vocal improvisations every day over the course of a year.
In cooperation with **Memo Akten** and an AI that recognizes her face and voice, she will present a collaborative live performance. **Alex Braga** has taken on the challenge of using a revolutionary instrument called **A-MINT** to design a new and organic sound. The artist plays tunes from which the AI produces endless melodies in real time. The long-time Ars Electronica collaborators **Stefan Tiefengraber** and **Ei Wada** will join forces for a special show. This will be followed by Linz' own Richard Eigner and his colleague Roman Gerold who will merge their project **Ritornell** with the vocal expressions of **Mimu Merz** to conclude the musical program in the courtyard.
After that, well-known artists from the electronic avant-garde scene can be experienced in the Gleishalle. **Vladislav Delay & AGF** will fill the spaces with a combination of electronic sounds and spectacular live visuals.
This is followed by a project by **Ryoichi Kurokawa**, aimed at revealing the power of art and nature using a wide variety of 3D data from architecture, ruins, and nature.

Nightline

While the music of the Bruckner Orchester in the Gleishalle fades and some listeners still hear the final sounds of the instruments as they fall silent, we are getting the console ready for the transition to danceable sound experiments. **Moritz Simon Geist** kicks things off in the courtyard of the POSTCITY with masterful technoid sounds generated by his robots. No less extraordinary will be the live set of ultra-digital music by **RRUCCULLA**, who also plays drums and operates the visuals.
In addition to the outdoor stage, a complementary program will be offered in the interior spaces of the POSTCITY. **Babii** opens the Gleishalle with her dark texts and futuristic sounds between electronically-tinged pop and R&B. Free-jazz drummer and multi-instrumentalist **Cid Rim** blends progressive electronic hip-hop with daring drum breaks when he takes the stage for an intermezzo before turning things over to **Sinjin Hawke & Zora Jones** for their A/V show, which is based on a 3D scan as a digital representation of themselves.
The show finishes off in the Salon Stage, a venue that has become known for acts firmly anchored in Internet art, fast and danceable rhythms, and a dash of humor.
This year's lineup at this bulk-mail office turned rave club features Linz's own **Stefan Tiefengraber, Chronic Youth** from Graz, **Polyxene** and HDMIRROR — familiar from "Rave Tool 66" — as well as a surprise guest.

Vog.photo

Stefan Tiefengraber (AT)

AG-MX70 DDX3216

Audio/video noise performance, 2019

Following the no-input approach, Stefan Tiefengraber is generating sound and video using only the inherent noise from two devices, a digital video mixer and a digital audio mixer. By connecting each mixer's outputs directly to its own inputs, as well as transforming the video signals to audio signals, and the other way around, these two formerly widespread but now outdated devices, are brought back to life.

The feedback loops enable the artist to use the built-in effects, equalizer and video transitions to force and push the mixers far beyond their usual operating conditions. This leads to new and unexpected results — a continuous blast of pure noise and flickering images. A broad spectrum of frequencies, combined with the video image, flows into the concert space, creating an immersive experience with a strong effect on the audience.

LOXOSconcept — Giulio Colangelo (IT), Valerio De Bonis (IT)

[re]BO[u]NDS ~ expanded media

We set out to design an electromechanical performer able to read a score of commands and to be extremely accurate in its work. *[re]BO[u]NDS* does not renounce composition merely to show a useless precision mechanism, albeit a complex one. Its structure is a well-defined composition form: a mechanism made human by the composer.
In the center of the room a vertical structure is set up, composed of 3 long glass cylinders filled with water, placed below the drippers. When a drop of water falls into a cylinder, the sound of the drop will be captured and processed in real time by a complex computer architecture which also oversees the spatialization. The original sound will bounce, within the space through all emitters. The multiphonic system will make all sound directions audible, highlighting several dialogues between sound points.

This "bounced structure" will be created by a sound patch designed with a range of delays and electronic elaborations that are characterized by parameters evolving in the time domain. These rebounds include macro-sounds (groups of autonomous cells) and micro-sounds (small portions of the drop of water). Imaginary forces join speakers as cells of the same structure, drawing BONDS within the space. The original sound, like a domino effect, will REBOUND in all directions through all the sound sources. From the "crystalline" sound of a drop of water to the "crystallization" of chaos due to its fall to the ground.

Producers: LOXOSconcept (IT) — Giulio Colangelo, Valerio De Bonis
Coproducer: ZKM | Center for Art and Media (DE)
Supported by the Foundation Matera-Basilicata 2019
Performer: Giulio Colangelo

Slawek Przerwa

Kilian Immervoll

Dagmar Dachauer (AT), Kilian Immervoll (AT)

The Feline Project

Cats rule the Internet. An endless stream of images and videos, memes, vines and gifs, create the most viewed content online — even more popular than porn. Both digital cat content and robopets use technology to fill a void. Why are we so fascinated with these domesticated felines? What do these binary creatures promise? In her new collaboration with video artist Kilian Immervoll, Dagmar Dachauer initiates an interaction between these ancient pets, humans and robots. She confronts the organic body in the digital space, as she glides through different hybrid states with a hyper-detailed and highly precise movement language. Hovering between humor and the uncanny valley, the wild and the domestic, the mystical and the postmodern, we are never really sure of what we are looking at in this performance. Dachauer zooms in on the changing relationship between human and non-human beings. Immervoll will share the stage. Sound artist Manuel Riegler creates the soundscape. The result is a phantasmagorical show, combining dance, video, performance, sound and live music.

Produced by umfug (A)
Co-Production: C-TAKT (BE), Plesni Teater Ljubljana (SLO), büro für tanz I theater I produktionen (A)
Residencies/Supported by Musiktheater Linz, De Warande, SZENE Salzburg, D.ID, Dommelhof, Seoul Dance Center, GC De Kroon, Tanzfabrik RedSapata, A.I.R. residency@ART SPACE stift millstatt, K.A.K. Koekelbergse Alliantie van Knutselaars, Ars Electronica Future Lab
The Feline Project is accompanied by Quentin Legrand / *www.ruebranly.com*
In cooperation with Ars Electronica Festival and Musiktheater Linz
Supported by Federal Chancellery Austria, Land Oberösterreich, Stadt Linz, Stadt Klagenfurt

Ryoichi Kurokawa (JP)

subassemblies

Audiovisual concert, 2019

subassemblies is a project that pursues the relationship between natural and human-made structures through a perspective of architectural scale. It consists of several different presentation formats such as concert, installation, prints (sculptures) and screening.
The main sources of this project are 3D data from laser scanning, thermal images and filmed footage of human-made architecture, ruins and nature, and those are distorted and reconstructed into modules as subassemblies to create a renewed timeline with layers of order and disorder while revealing the force of both nature and art.
Ruins, buildings invaded by nature, and architectures in disrepair are superimposed and rebuilt dynamically, and rendering those unusual characteristics in multi-layered depth extends the perception of floating — not only between natural and human-made structures, but also between abstract and concrete phenomena through transition, destruction and renaturation. The motions such as cancellation of physical law, hybrid of natural and artificial components, and transposition of entropy and negentropy enhance those unusual characteristics.

Concept, direction, composition, programming: Ryoichi Kurokawa
Producer: Nicolas Wierinck
Co-production: LOXOSconcept (Matera 2019), MUTEK, Scopitone/Stereolux, TodaysArt
Produced by Studio RYOICHI KUROKAWA

Episode am Fluss

A tribute to the first Klangwolke 1979

Ars Electronica, the Bruckner Orchestra under Markus Poschner, and the Brucknerhaus cooperate to trace the history of the *Klangwolke*. After the large visualized cloud of sound on Saturday, a tribute will be paid to the beginnings of this special project on Sunday evening.
As in 1979, the starting point of this sound journey will be the orchestra concert in the Brucknerhaus, which will not only be broadcast to the outside world through the powerful sound system of the Klangwolke, but will also provide sound material for the artists to create new acoustic, analog and digital sound spaces in the Donaupark.

Markus Poschner (DE), Rupert Huber (AT), Roberto Paci Dalò (IT)

Improvisation

At this year's festival Markus Poschner, Rupert Huber and Roberto Paci Dalò, three composers/ musicians coming from as distinct areas as classical music or experimental sound art, will improvise together in the Danube park in Linz. Poschner is a well-known conductor who has received various prizes and is regularly invited by national and international top orchestras. Currently he is the Chief Conductor of the Bruckner Orchestra Linz.

Roberto Paci Dalò is a sound and visual artist, author, director, composer/ musician. His work has been presented worldwide and won him admiration from, among others, Aleksandr Sokurov and John Cage.
Rupert Huber is a composer who is widely known for his piano music and music installations as well as his electronic music project TOSCA. For Huber, music is communication, as well as an active state of peace.

Rupert Huber, © Larry Hisrhowitz

Roberto Paci Dal, © Carlo Stanghellini

Markus Poschner, © Volker Weihbold

Max Bauer

Wolfgang Dorninger (AT)

Innen Außen

Creating a sound space in the interior that overcomes the physics of space is what drives me. To remodel natural sound spaces in the outdoor area, as well. Two completely different sound spaces collide violently in "Inside Outside." Somewhere the sound space expands, elsewhere the flow is prevented. The sound performance *Innen Aussen* is based on field recordings, synthetic sounds of self-made sound machines, artificial bird sounds and algorithmic sound generation. The piece consists of about 30 different voices, which are scenically prepared, like an acoustic road movie, telling sprawling stories for two completely different spaces.

Sam Auinger (AT)

Bruckner meets Highway 2

A musical dialog between the installation *Harmonic Bridge* by O+A (Bruce Odland/Sam Auinger) and the 4th movement of Anton Bruckner's First Symphony

The Highway 2 overpass acoustically severed the downtown shopping district of North Adams, MA from the newly emerging Museum Campus of MASS MoCA with road noise and uncongenial architecture. In 1998, O+A installed two 16-foot tuning tubes generating Harmonic Series in the key of "C" in response to traffic noise, and the resulting music was sent in real-time to two "Cube" loudspeakers installed at architectural focal points beneath the bridge. For more than 20 years, this unused urban space has been humanized with real-time music, reclaimed as a harmonic resonating cathedral that links the two communities acoustically.
In this performance, the 4th movement of Anton Bruckner's First Symphony will enter into a musical dialog with the transformed and tuned traffic sound of Highway 2 in Massachusetts, US.

Anton Bruckner Symphonie No.1, 4th movement, Bruckner Orchestra
Harmonic Bridge by O+A (Bruce Odland, Sam Auinger) at MASS MoCA, North Adams, real-time sound installation since 1998

Christian Fennesz (AT), Lillevan (SE/IE)

Agora live

Agora is Christian Fennesz's first solo album since *Mahler Remixed* [Touch, 2014] and *Bécs* [Editions Mego, 2014]. Due to the temporary loss of a proper studio workspace he had to do the record with a minimum of equipment. "[At first] it was a rather frustrating situation but later on it felt like back in the day when I produced my first records in the 1990s. In the end it was inspiring.", he said. At the festival Fennesz will play his new album *AGORA* alongside with visuals by Lillevan.

Antye Greie-Ripatti (DE), Vladislav Delay (FI)

Vladislav Delay & AGF present Rakka

Antye Greie (also known as AGF) is a music producer, sound artist & curator, poet, gender activist. Her artistic tools are language, sound, listening, voice, and communication which she expresses in mixed media. Since 2011, she is the organizer and co-founder of Hai Art in Hailuoto. Antye campaigns for diversity in the arts with the women's collective female:pressure. She runs her own music publishing label AGF Production and has collaborated with Eliane Radigue, Gudrun Gut, Kaffe Matthews, Craig Armstrong, and Ellen Allien amongst many others.
The Wire described Vladislav Delay as "one of the most consistently creative artists working today." Reinventing himself regularly, he takes electronic music where he pleases with a unique blend of depth and detail. His music is like a non-existing soundtrack for the underworld; murky, dark and constrained.

antyegreie.com
vladislavdelay.bandcamp.com

Ali Nikrang (AT)

The Self-reference, Three AI composed Canons

A musical canon is a piece of music in which a voice is imitated by several time-shifted voices. The imitation and the resulting melodies make the canon one of the most complex forms of classical music. On the other hand, the strict formal structure makes the canon interesting for an AI system.
The three canons played here are composed with a technique from AI research called genetic algorithms. Genetic algorithms are biologically inspired AI techniques. A genetic algorithm can be roughly regarded as a simulation of the process of natural selection: From an initial random population of genes (so-called individuals), the best genes are selected, recombined and mutated into new generations and populations. In the program, an individual represents a musical idea. The musical quality of the individuals is evaluated according to various subjective criteria and the individuals are paired with a higher rating in the next generation.
In the Donaupark performance, each canon voice is reproduced by a different loudspeaker; the delays caused by the distance between the loudspeakers amplify the already "self-colliding" nature of a canon voice. The result is a spatially harmonious sound landscape, generated by the fusion of a single voice with itself.

Maki Namekawa (JP), Dennis Russell Davies (US), Cori O'lan (AT)

Pianographique — Piano Music meets Digital Images

The festival will conclude this year with another collaboration of the two pianists Maki Namekawa and Dennis Russell Davies with the digital visual artist Cori O'lan. It is part of a multi-year Ars Electronica project dedicated to the visual interpretation of musical expression and perception as well as the direct encounter between analog sound and digital visuals.

The evening's music program includes a "classic" and a premiere. *L'Oiseau de feu* (*The Firebird*) by Igor Stravinsky is a reference piece in music history and Dennis Russell Davies has arranged it for piano four-hands. The second part is the Austrian premiere of the first piano sonata by Philip Glass, which he dedicated to Maki Namekawa. Composed 110 years after *The Firebird*, the piano sonata is a joint commission of Klavier-Festival Ruhr, Philharmonie de Paris, and Ars Electronica. Its world premiere performance took place in July 2019 at the Klavier-Festival Ruhr and both the composer as well as Maki Namekawa received enthusiastic appreciation.

ABOUT THE MUSIC:

L'Oiseau de feu (Der Feuervogel),
Igor Stravinsky, 1910
Arrangement for piano four hands:
Dennis Russell Davies

In 1909, when Igor Stravinsky began to work on the music for the ballet *The Firebird*, which Sergei Diaghilev had commissioned for his *Ballets Russes*, he was still a young and little-known composer. The premiere of *The Firebird* in Paris in 1910, which was equally celebrated by audiences and critics, suddenly made the 27-year-old Igor Stravinsky internationally famous.
With his complex rhythms and extraordinary tonal effects of the great orchestra, Stravinsky created a surprising and gripping characterization of the mystical story of Ivan Zarevich, who defeats the evil sorcerer Kaschej and his demons with the help of the firebird.
Dennis Russell Davies built his arrangement for piano four-hands on Stravinsky's piano score and it is amazing how varied and sensitive he succeeds in transferring the effect of the overwhelming, colorful richness of the orchestral sounds into the fragility of the piano sound. Reduced to the elementary sound, it opens up a persuasive path to the essence of Stravinsky's great composition.

Piano Sonate No. 1, Philip Glass, 2019

"The Sonata is colorful, wild, excitingly jumpy…" — with these words Malte Hemmerich begins his review of the premiere of Philip Glass's latest work at the Klavier-Festival Ruhr on July 4th 2019 in the Frankfurter Allgemeine Zeitung.
He further continues "… it is a prime example of Philip Glass's piano music with its opposing rhythms, and there are also many other familiar elements from the composer's etudes and individual works. In such a wild kaleidoscope, however, they appear here for the first time."
It is Glass's most demanding piano work to date; the rapid succession of virtuoso octave jumps are close to the limit of playability. Namekawa breathes this music, the piece is an example of how an incomparable unity can arise from the close collaboration between composer and interpreter.

ABOUT THE VISUALS:

As always in Cori O'lan's collaboration with Dennis Russel Davies and Maki Namekawa, the visualizations are pure real-time graphics, i.e. there are no prepared videos or image sequences that are synchronized to the music. It is only the sound of the piano directly picked up over two microphones, which is analyzed by computer and thus provides the parameters with which the graphics are generated, animated and modified — live in the moment of the performance.
The very dance-like animations of the graphic elements designed to correspond to *The Firebird* ballet and its characters are derived exclusively from the sound spectrum and dynamics of the music, without motion tracking or keyframe animation. The parameters derived from the music are directly assigned to various parameters of physics-based simulation models, particle systems as well as to the geometries, colors and lights.

THE STORYLINE OF THE BALLET:

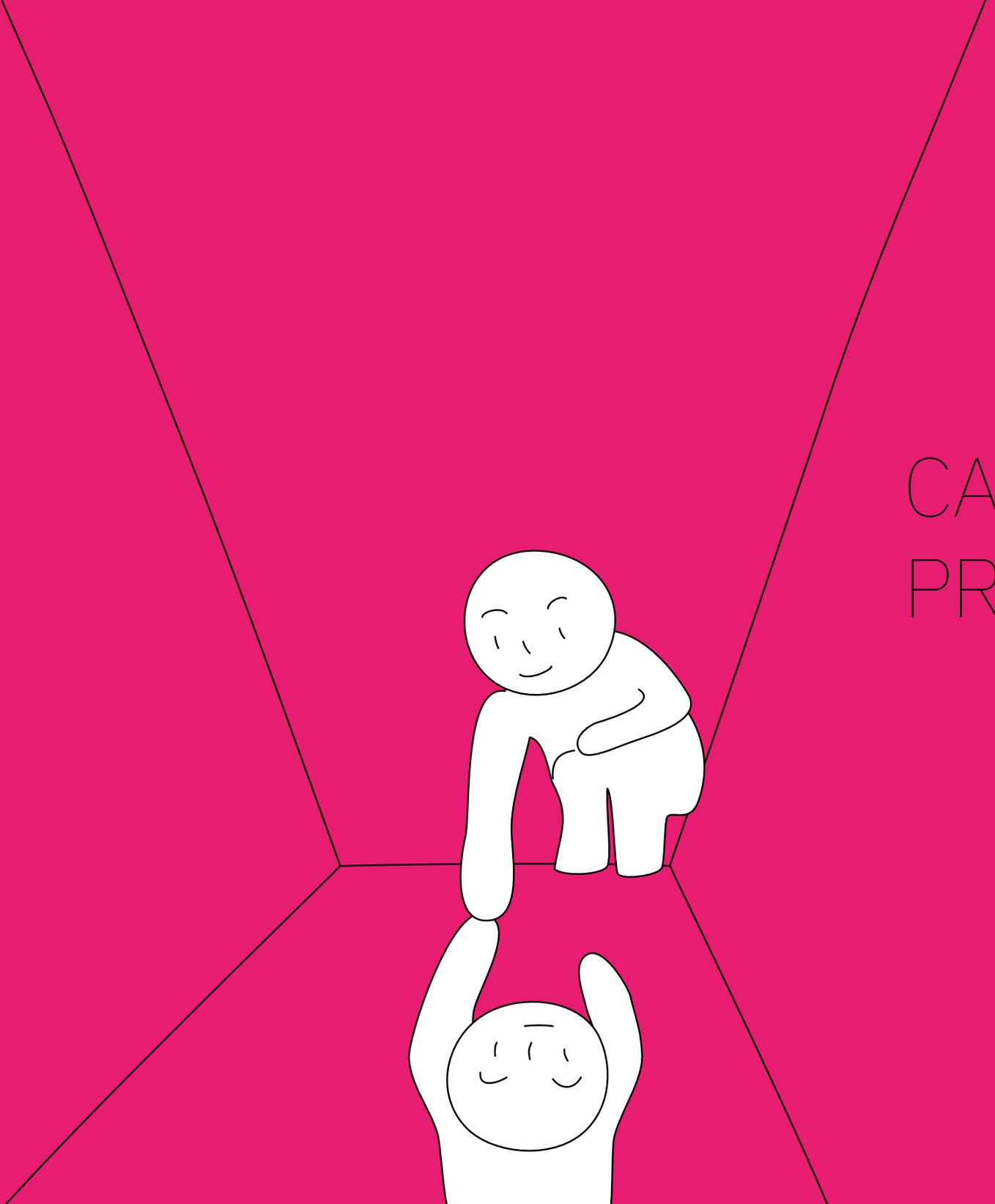
The young Prince Ivan chases the firebird and enters the magician's garden. At the wonder tree he catches the bird, which asks for its freedom. When the prince grants it this freedom, he receives a feather which has magical powers and which summons the firebird in case of danger.
Thirteen virgins, held captive by the sorcerer Kaschej, come into the garden and dance around the tree. Among them is Princess Zarevna, with whom Ivan falls in love immortally.
Threatening signals announce the appearance of Kaschej and his demons.
They harass Ivan Zarevich and want to kill him. At his moment of greatest need, he calls the firebird with the feather. The firebird appears and forces Kaschej and the demons to dance with magical music and then sings them into a deep sleep.
The firebird reveals to Ivan a cave under the roots of the miracle tree, it is the hiding place of a giant egg in which Kaschej keeps his soul. The prince smashes the egg, the magician's power disappears and he dies. His captured victims are now freed and Princess Zarevna and Ivan Zarevich are united.

Piano Sonata by Philip Glass

Commissioned by Klavier-Festival Ruhr,
Festival Ars Electronica, Philharmonie de Paris,
World Premiere Performance July, 2019.

Supported by Yamaha

CAMPUS PROGRAM



CAMPUS

Every year since 2002, Ars Electronica and the University of Art and Design Linz have hosted an exhibition by artists associated with an international higher-education institution whose curriculum takes an innovative approach to teaching media art and media culture.
Initiated by Prof. Reinhard Kannonier (University of Art and Design Linz) and Gerfried Stocker (Ars Electronica), the intention of the *Campus* format is to invite outstanding international universities working in the academic fields of media arts and design. Projects highlighted here represent the nature of the mission and activities of invited guest universities from all around the world. These showcases became an essential part of the festival and an instrument to analyze and visualize different models of educational approaches in artistic and creative areas. It has also increasingly developed into a stage for contextualized works from alumni, professors or associates from the universities to map the identity of academic institutions, their history and current practice.
Part of *Campus's* mission is to enable the presentation of young, local media artists and their work with international exposure. The Interface Cultures program of the University of Art and Design Linz annually presents a cross-section from their masterclass works and, together with Ars Electronica, co-hosts one main featured partner university each year. The festival is increasingly becoming a platform for artistic and creative collaborations between Ars Electronica and various regional, academic partners, for example the Fashion & Technology or the Visual Communication program at the University of Art and Design Linz, the Anton Bruckner Private University Upper Austria or the University of Applied Science Upper Austria, Campus Hagenberg.

2002: Academy of Media Arts, Cologne (DE)

2003: Department of Media & Art at the University of Art, Media and Design in Zurich (CH)

2004: IAMAS (JP)

2005: Srishti School of Art Design and Technology, Bangalore (IN)

2006: Medialab at the University of Art and Design Helsinki (FI)

2007: HGK FHNW, the Swiss Institute for Postindustrial Design (CH)

2008: University of Tokyo (JP)

2009: MIT Media Lab (US)

2010: Media Campus of the Darmstadt University of Applied Sciences (DE), School of Art & Design at the Cork Institute of Technology (IE)

2011: University of Tsukuba (JP)

2012: UdK — Berlin University of the Arts, Sound Studies (DE)

2013: Bezalel Academy of Arts and Design, Hamidrasha Art School of Beit Ber College, Holon Institute of Technology, Kibbutzim College of Education, Technology and the Arts, Shenkar College of Engineering and Design, the Media Innovation Lab at IDC Herzliya, Musrara School, the Neri Bloomfield School of Design and Education, Hadassah Academic College and the College of Management — Academic Studies (COMAS) (IL)

2014: Arts2 — École Supériere des Arts (BE)

2015: Paris 8 University (FR)

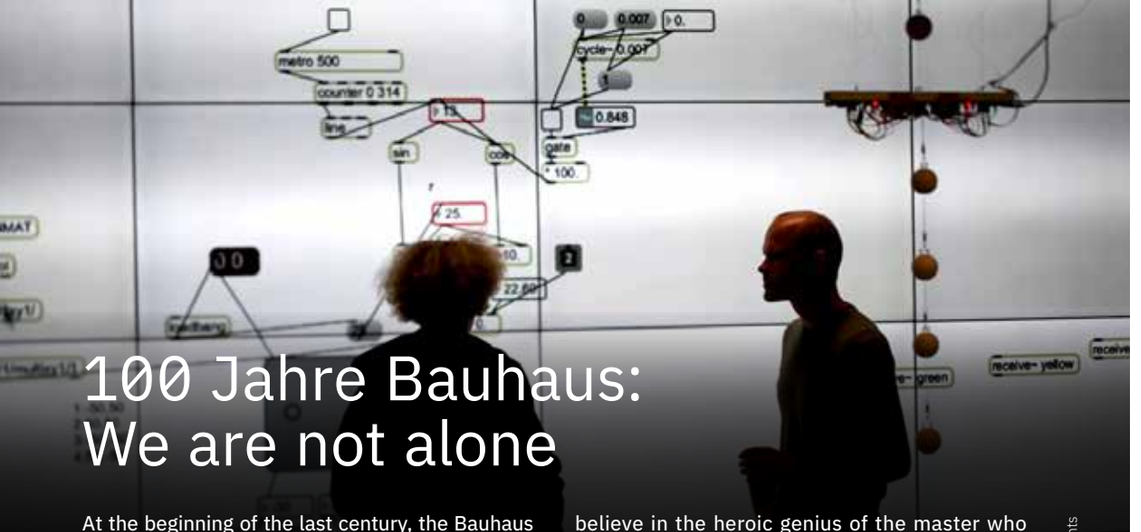
2016: Tsinghua University Beijing (CN)

2017: University of California Los Angeles (US)

2018: Hexagram, international research network (CA)

Campus is also a platform for international exchange between universities, leading to increasing collaboration between academic partners. In 2019, 57 universities and institutions from many parts of the world are represented:

Bauhaus University, Weimar (DE)
University of Art and Design Linz (AT)
University of Tsukuba (JP)
Aichi University of the Arts (JP)
Academy of Arts, Architecture and Design in Prague (CZ)
University College London, The Bartlett School of Architecture (UK)
London College of Communication, University of the Arts London (UK)
Wimbledon College of Arts, University of the Arts London (UK)
Camberwell College of Arts, University of the Arts London (UK)
London College of Fashion, University of the Arts London (UK)
Austrian Design Network UNIFH (AT)
Universität für angewandte Kunst Wien (AT)
FH Voralberg — University of Applied Sciences (AT)
FH Joanneum University of Applied Sciences (AT)
Fachhochschule Salzburg (AT)
St.Pölten Univeristy of Applied Sciences (AT)
New Design University, St. Pölten (AT)
Universität Mozarteum, Salzburg (AT)
Alpen-Adria-Universität Klagenfurt (AT)
FH Oberösterreich — University of Applied sciences Upper Austria (AT)
Central Academy of Fine Arts Beijing (CN)
Technische Hochschule Ingoldstadt (DE)
Shantou University (CN)
University of Theatre and Film "I.L. Caragiale", CINETic Bucharest (RO)
Queen Mary University of London (UK)
HKU University of the Arts Utrecht (NL)
University of Applied Sciences Würzburg-Schweinfurt (DE)
Academy of Media Arts Cologne (DE)
KOCCA Korea Creative Content Agency (KO)
Sejong University (KO)
Konkuk University (Konkuk University-Industry Cooperation Foundation) (KO)
Korea National University of Arts (KO)
ChungKang College of Cultural Industries (KO)
Chung-Ang University (KO)
Ajou University Industry-Academic Cooperation Foundation (KO)
Mokwon University (KO)
Kyungnam University (KO)
Gyeongnam Culture and Arts Foundation (KO)
Jeju Film & Culture Industry Promotion Agency (KO)
Cheju Halla University (KO)
Gwangju University (KO)
Asia Culture Institute (KO)
Chungnam Culture Technology Industry Agency (KO)
Sangmyung University (KO)
Sungkyul University (KO)
Anyang Creative Industry Promotion Agency (KO)
Dongguk University Gyeongju (KO)
The Center of Research for Silla Culture (KO)
Culture Art Design Institute (KO)
Kaywon University (KO)
Soonchunhyang University (KO)
Esad Saint-Étienne/Ensba Lyon, Digital Research Unit in Art and Design (FR)
School of the Art Institute of Chicago (US)
Roy Ascott Studio, Shanghai (CN)
Masaryk University Brno (CZ)
University of West Bohemia (CZ)
University of Lisbon (PT)



Lehrstuhl Media Environments

100 Jahre Bauhaus: We are not alone

At the beginning of the last century, the Bauhaus developed methods of abstraction, formalization, and general concepts to understand, describe, and change the world. This resulted in production methods of unique efficiency and variability. The aesthetic view also changed: clarity and transparency, but also a focus on the people, their perception, competencies, and needs are characteristics of its tradition.

Today we work with highly differentiated digital tools. And anyone familiar with these tools knows the difficulties of creating in synthetic worlds a dense atmosphere equal to our analogue world. An unprecedented loneliness had settled into digitally generated artifacts that tell us that until today we have not grasped the entirety of the surrounding atmosphere or even its essence, so we could adequately grasp it. *We are not alone* consoles and warns us: it promises an answer from the ecosphere — animals, plants, cosmos, which speak to us in an old-fashioned way — just as it reminds us that we still do not understand enough of this ecosphere, just as we overlook many other humans who do not live in our culture, our sphere of life, or our social class. And it reminds us that the world does not end with the Earth or even our own limited field of vision. At the same time, the title points out that our technologies are not passive tools that we use with our hands. Rather, they have mutated into co-creative teammates who make predictions, take decisions, and not only generate their own suggestions for action but also implement them. We are not alone!

As artists and descendants of the Bauhaus, we recognize that our role is changing. We no longer believe in the heroic genius of the master who forms the world in a state of intuition. Embedding and feedback reveal that responsible action requires diverse cognitive variations that involve the counterpart in a performative way.

We are looking for practices that place us in a manageable field of action and allow us to uncover a variety of our perceptive abilities. We open the black box of a knowledge-based view of our environment and attempt to take direct action within hearing and sight range. Techniques that we use experience their horizon at the perceptual threshold of the senses. System configurations make it possible to shift this threshold by opening up a space of resonance made of objects, tools, and networks within this sensory range.

In order to leave the human-centered habitat, we synchronize our actions with our perception, separating seeing, hearing, and feeling from its purposefulness, to become attentive to the world's expressions as such. This is the starting point for a revision of scope of action, control strategies, and future visions.

Here we meet Lazlo Moholy-Nagy again, who lamented 100 years ago that man has lost his manifold sensory and craft skills through modern means of production. "In constant struggle with his instincts, he is raped by external knowledge," writes Lazlo Moholy-Nagy in his book *From Material to Architecture*. Inspired by his statement, we would like to recapitulate what forms of cultural design we would like to deepen today.

Text: Ursula Damm

Shared Habitats

The exhibition *Shared Habitats* focuses on the influence of technology on socio-cultural processes through fourteen works of a digital, biological, and interactive nature. The exhibition focuses on the location of organisms in their environment, the effects of humans on their habitats, and the artistic handling of new biomaterials and technologies. Many of the works on display are based on scientific experiments that are analyzed in a cultural context.

Interactions of humans with non-human creatures and with machines and technology will be examined in equal measure. In order to develop new ways of understanding, the exhibition proposes continuous, evolving feedback processes between the respective actors.

It seeks the expansion of seeing, thinking, and acting. *Shared Habitats* refers to the ideas of the biologist Jakob von Uexküll — his respect for the individual world and perception of a being — and develops an aesthetic of exchange. We develop visions and new spheres of possible futures. At the same time, the exhibition wants to present the Bauhaus University as a place of innovation in art, technology, and science.

Concept: Ursula Damm
Curated by: Ursula Damm
Curatorial Assistance and Coordination: Theresa Schubert
Coordination and Technical Lead: Mindaugas Gapševičius
Website Design and catalog: Matthias Schäfer
Supported by: Goethe-Institut, das Nordische Netzwerk
Co-produced by: MO Modern Art Museum in Vilnius, Lithuania

Ursula Damm (DE)

Drosophila Karaoke Bar

Installation with living flies and sound (2019)

Drosophila Karaoke Bar invites visitors to establish a direct exchange with fruit flies through a technical interface that invites visitors to talk and sing with the flies. Software translates human speech into the perception range of flies, allowing auditory interspecies feedback. A large pile of sand covers the flies' habitat. Its weight insulates their buzzing from the noise of humans, representing the sensory and semantic gap between a fly and a human. On another listening station the flies' sounds are modulated in real time raising the question of whether there are more hidden patterns of communication within the fly songs than known by science thus far.

Scientific Consultation: Birgit Brüggemeier
Programming Karaoke Bar : Felix Bonowski
Programming Fly Songs: Johann Niegel

Julian Chollet (DE)

Humus, Humanity & Humility

Installation (2019)

Humus is more important than art, money, or success. Humanity depends on intact ecosystems and fertile soil. Humility and responsibility will help our species survive.

Juan Pablo Diaz

Humus, Humanity & Humility

Maria Degand (FR/DE), Leon-Etienne Kühr (DE)

microplastic_hyperobject

VR installation (2019)

Numbers and graphs are the essence of most scientific papers. They try to describe the world, facts, and problems. Microplastics are one of these problems. This artistic research is an example of how people can literally be put in these graphs. It looks at the real problem particle in this particle system. The design of experimental research is set up to simulate the experience of the hyperobject in virtual reality. Experiments on the scale in virtual reality and about connections in virtual space.

Frauenförderfond Universität Weimar

Maria Degand

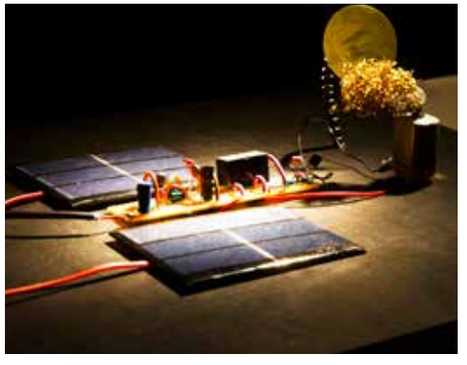
microplastic_hyperobject

Maike Alisha Effenberg (DE)

Thoughts on Day and Night

Analog electronic installation (2019)

By extending mechanical models from the 60s, you will find here a new approach towards nature and ecosystems. Contemplate the equality of the energy flow within a machine and within an organism. Both receive their energy from the light, react to it, and save it for processes at night. At least, this is what we think they do. So how much life do we find in a machine and how much construction do we find in nature?



Thoughts on Day and Night

Mindaugas Gapševičius (LT/DE)

Introduction to Posthuman Aesthetics

Installation with devices and videos (2016 — 2019)

These toolkits invite their users to carry out scientific experiments on a DIY level and be able to introduce their simplified, accessible versions to a broader community. The prerogative is to render and outline methods for independent research, opening the black box of empirical experiments to individuals across disciplines. Whether framing the discussion of political, economical, or cultural issues, the toolkits question the creativity of non-humans and do not presume humans to be the only creative force at work.

Brigita Kasperaite

The project is supported by Nordic Culture Point and the Council for Culture of Lithuania.

Jan Georg Glöckner (DE)

close encounter

Living sculpture (2019)

The work displays a fungus living in a 90 liter bioreactor. In the bioreactor the fungus is kept alive by an artificial life support system that supplies it with the water, sugar, and oxygen that are its basic needs. The fungus adapts to this system and transforms its body into round pellets that are submerged into the liquid. The bodily presence of the fungus in the bioreactor offers humans the chance to observe and to reflect about so-called “natural” and artificial habitats.

Rytis Seskaitis

Janis Liepins (Institute for Microbiology and Biotechnology, University of Latvia) Diana Meiere, Inita Daniele (Latvian Museum of Natural History), Dr. silv. Tālis Gaitnieks, Dr. biol. Natālija Burņeviča (Latvian State Forest Research Institute “Silava”), Latvian Mycology Society.

Kristian Gohlke (DE), Christian Wiegert (DE)

Bubbles and Clouds — Illuminated Interactive Inflatables

Installation — Membranes, Electronics, Air, Light (2019)

Interactive pressure-stabilized membrane structures (“Pneus”), suspended from the ceiling, discreetly illuminated from the inside. As visitors pass through the room, through touch and draughts, the objects respond. Attempts to elucidate the objects creates a dialogue of light, sound and movement. In the course of the casual interaction, the visitors become part of a performance. The boundaries between viewer and performer, space and content begin to drift — bubbles wafting in clouds.

Christian Wiegert

Rico Graupner (DE)

ZoomBx: KTV Sessions Vol II.

Installation with terrarium, beetles, and speakers (2019)

ZoomBx: KtV Sessions Vol II. focuses on the experimental exploration for real-time-driven composition of public soundscapes. Sound events and movement patterns inside a terrarium are tracked, interpreted, and acoustically applied to a concrete fusion with the outer soundscape. The result is an automated soundscape composition between randomness and determinism, from which questions about the cultural significance of designed sounds and the originality of acoustic phenomena can be deduced.

Concept /Realisation: Rico Graupner — Programming: Ives Schachtschabel.

Rico Graupner (DE)

^lgorithmZoo Pt. 5. : KTV Session

Concert : Livemapping, 12 channel audio (2019)

^lgorithm Zoo pt. 5 "KtV Sessions Vol II. is a concert series that deals with the sonic fusion of different biological habitats. In this case, a beetle-controlled synthesizer interacts with the sound installation *ZoomBx*. The movement events of the insects are tracked by a specially developed software (IcCE) that makes it possible to map the acquired data to musical parameters as well as different positions in space.

Stephan Isermann (DE)

Pig Simulator

VR game (2015 — 18)

The *Pig Simulator* takes place in virtual reality but also in real space. The goal is to escape the slaughter in virtual reality — and, as in the real life of the real pig, this idea becomes futile. The user will live and die like a pig and experience the habitat of the animal as closely as possible through the virtual embodiment of an artificial and cruel habitat designed by humans to satisfy our desire for mass consumption of meat. The *Pig Simulator* may subvert common expectations about gaming and fights the dark irony of a just world of unequal life forms living in the shared habitat called Earth.

Michael Markert (DE)

Stereospacer: Nature Space

Mobile application and walk (2018)

Explore how virtual insect and physical city sounds mix and discover how this experience changes the perception of the area outside the exhibition space. *Stereospacer* is a mobile application platform for augmented audio reality. Virtual sounds are placed in space and appear as binaural spatial sounds for users when they explore these spaces. *Stereospacer* is an ongoing stereophonic research project about how mobile stereophony will change navigation and movement through space.

Sebastian Kaye (UK/DE)

Global Consciousness Interface

Networked device (2019)

Global Consciousness Interface is a portable interface that allows users to connect themselves to this net of consciousness whenever they feel the need. As "esoteric electronics," this device mirrors a part of the tantric approach in Tibetan Buddhist meditation; by using body, speech, and mind, one's totality is applied. Here, the body is reflected in the use of the user's heart rate, the bell symbolizes speech, and the mind is united with itself through this interface.

Freya Probst (DE/UK)

Rhizomes

Installation and clothing items from organic substrates (2017 — 2019)

These grown gowns are the outcome of a series of experiments and playful interactions with plants and the observation of their roots through photography or time-lapse video. Experiments with pearls, small gears, or the positioning of seeds lead to different plant responses. The outcome was eventually applied to larger surface areas in the shape of cutting patterns reminiscent of fine woven textiles. The exhibits show a subterranean, hidden aesthetic of a natural structure that cannot be copied by humans.

Homero Ruiz (MX/DE)

The Poetic Design: From Mimesis to Catharsis.

Book project and drawings (2019)

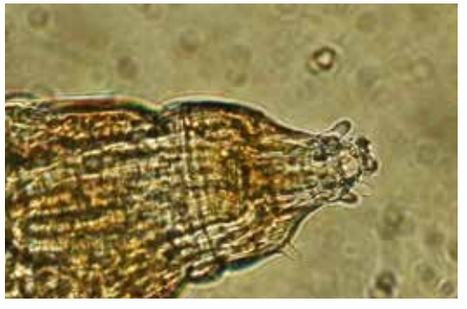
The Poetic Design: From Mimesis to Catharsis explores the visual poetry and basis of Greek aesthetic philosophy through its four main elements: Mimesis, Poiesis, Apate (Esthetic Illusion), and Catharsis. The series of illustrations are part of the artist's master thesis at the Bauhaus University, Weimar and are the result of analysis of "the natural process of creation" and the visual poetry generated from the alteration of meanings in materiality by melting discourses into these physical elements.

Maria Antonia Schmidt (DE)

TARDIGRADA — von mikrobiotischen Lebenskünstlern

Sound installation and microscope with tardigrades (2017)

The tardigrade or water bear, a microorganism, survives environmental conditions that hardly any other living creature can withstand. While researchers are working on deciphering the secrets of the tardigrade's survival, the media are throwing themselves at the cute bear and marketing it in all conceivable variations. In the end, the work poses the question of what sound these tiny creatures make. This is reason enough for the world's first tardigrade nano-ear experiment: a musical radio feature/4channel audio installation between science and absurdity.



Prof. Dr. Hartmut Greven, apl. Prof. Dr. Ralph O. Schill, Martin Mach, Carla Pernpeintner, Frank Petschull, Sibylle Schmiech, et al, Ludwig-Maximilians-Universität in Munich, Chair for Experimental Radio at Bauhaus University, Weimar.

Theresa Schubert (DE)

Growing Geometries — tattooing mushrooms

Installation with living fungi, video and photographs (2015 — 2016)

Growing Geometries — tattooing mushrooms explores the morphology of fungi and evolution of geometrical shapes on living and growing membranes. As part of Theresa Schubert's PhD research on agency in biomedia art, human and nonhuman relationships are investigated with a focus on methods of generating images by nature. The deeply anthropocentric gesture of tattooing puts the fungi closer to mankind and helps to translate a growth process into an aesthetic experience.

Alexandra Toland (US/DE)

Probing the Planthroposcene: Excerpts from a Dis-service Society

Installation (2019)

Can "ecosystem services" and disservices provided by plants be seen as phyto-technologies of multi-species societies? How are spaces of creative dissonance, resilience, and resistance created by outliers: pests, parasites, invasive species, and allergens? What moral agency do humans have in determining the assets and liabilities of plants during the environmental strains of the Anthropocene? These questions are explored through an assemblage of objects, images, and recordings featuring plants as protagonists in natural habitats along roadsides, probing what Natasha Myers (2016) has dubbed the "Planthroposcene."

Concept, Dust Etching, Images: Alexandra Toland (Bauhaus University, Weimar). Further Image credits: Uwe Starfinger (Julius Kühn-Institut). 3D pollen imaging: Michael Braun (Bauhaus University, Weimar). Glass casting: Lena Trost (IKKG — Hochschule Koblenz Glass Studio). Film: Johanna Ickert and René Arnold

In addition to the thematic exhibition “Shared Habitats,” Bauhaus University, Weimar will present other projects from the departments of Experimental Radio, Media Environments, Human-Computer Interaction, and Product Design.

Relations — Experimental Radio Showcase

Relations showcases productions from the Chair for Experimental Radio at Bauhaus University, Weimar that focus on the links and dependencies relevant to the students. The relationships among humans, between humans and their environment, and between humans and work, create a loose structure for the pieces.
The productions of students and alumni are presented in a carefully curated festival program. Recent award-winning radiophonic pieces create an engaging narrative that invites the visitor to slow down, sit back and listen.

WITH THE FOLLOWING WORKS:

Susanne Altmann: *Brede und Dürr*
Julius Baars, Konrad Behr, Laura Anh Thu Dang, Jan Glöckner, Grit Lieder, Eleftherios Krysalis, Johann Mittmann, Janine Müller, Severin Schenkel, Markus Westphal, Anton Worch: *Strata (radia s40 n694)*
Christina Baron: *Nordlichter*
Konrad Behr, Laura Anh Thu Dang, Jan Glöckner, Grit Lieder, Eleftherios Krysalis, Johann Mittmann, Janine Müller, Severin Schenkel, Markus Westphal, Anton Worch: *Slow Radio*
Laura Anh Thu Dang, Jason Langheim, Grit Lieder, Doreen Smolensky, Markus Westphal: *A Fabulative Archipelago*
Regine Elbers: *Abdrift*
Christoph Höfferl: *Tunar*
Rafael Jové: *Das Radio ist nicht Sibirien*
Fabian Hapich: *Detektei Flenzer*
Stefanie Heim: *Born to Work*
Nils Lauterbach: *A Gooey Mess*
Mara May: *Jan Waldemar Stange*
Ludwig Müller: *Bitte keine heiße Asche einfüllen*
Maximilian Netter: *Das Schweigen der Tiere*
Josephine Prkno: *Im Hintergrund der Wasserhahn*
Christopher Schön: *Der Bär*
Vivien Schütz: *Ferngänge*
Söhnke Sofar: *Entwürfe zum Thema Druck*
Andreas Stosch: *Ob Dach oder Los*
Benjamin Voßler: *If you see them, shoot them*
Elena Zieser: *Helena*
Daily live performance by Tommy Neuwirth: *Das weltweite Netzwerk für ein bedingungsloses Grundeinkommen* (the worldwide network for an unconditional basic income). “DwNfebG” stands dressed in a blue suit with both legs firmly on an empty beer crate and sings old familiar pop songs. It transforms incidental humming into overwhelming opera choirs and amusements into anti-capitalist lamentations.

All works produced at the chair of Experimental Radio of the Bauhaus University, Weimar.
www.experimentellesradio.de
Supervised by: Alessandro Bosetti, Knut Aufermann, Islands Songs, Nathalie Singer, Astrid Drechsler, Fabian Kühlein, Martin Hirsch, Mario Weise
Coordination: Martin Hirsch

Other works of Bauhaus University, Weimar

Jörg Brinkmann (DE)

Simulation

Video, 2011

The sound of a voice from a YouTube clip is analyzed with custom software and translated into servomotor movements. The mouth moves in synch with the video’s voice, which is realized with a bulldog clip that is attached to the lower lip. In the original video clip, a controversial and much-discussed shaman known as Little Grandmother delivers a monologue about religion, ego, and love reminiscent of a mantra.

Timm Burkhardt (DE)

Machine to Support the Starving Artist

Microcontroller, thermal printer, stainless steel. 2016

This work is designed to undermine the vital but patronizing “Harz IV” agenda of the German government in which self-employed individuals must send in records of their expenses in order to verify the necessity of support. Made of stainless steel, this unobtrusive machine is suited for the harsh environments of the streets. It generates receipts for random items, quantities, and sale amounts. Each receipt is printed on thermal paper like an actual receipt and could be sent to the authorities.

Timm Burkhardt (DE)

Privacy Machine

Laptop, webcam, software. 2019

An electronic way to say, “I want to be private today and not appear in your social media photos.” *Privacy Machine* is a working proof of concept: stand in front of the screen and take the badge or the scarf. Both have a special pattern on it. As long as this pattern is recognized by the camera, the software will pixelate your face. It‘s an unrealistic wish because manufacturers would have to integrate this software into their smartphones as a default.

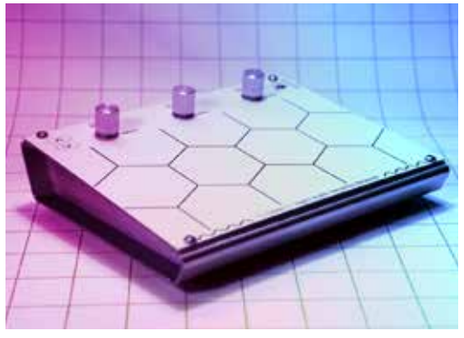
Max Kullmann (DE)

[burnout] Maschine

Electronics, steel, aluminum. 2016

The *[burnout] Maschine* was designed to prevent individuals (who are part of an increasingly stressed society despite diminishing physical work) from burning out by taking on this exclusively human inadequacy. At the same time, the relationship between man and machine is questioned.

Henry Sowinski



The Center for Haptic Audio Interaction Research (CHAIR) (DE)

Tickle

Acoustic interface, 2018

The *Tickle* is an acoustic interface for sound. It's designed as the missing input device for physical modeling synthesis. Vibrations are captured on the surface and fed into digital resonators. It responds naturally to hitting or scratching, even bowing on the edge, making the interaction embodied, intuitive, and intimate.

Max Neupert
https://chair.audio

Moritz Wehrmann (DE)

Alter Ego (Version II)

Installation 2013

Alter Ego questions the mimetic inter-relationship between two persons. It creates a mental conflict of self-localization, a feeling of self-loss and a feeling of empathy at the same time. The work is foundation for a cooperative with neurophysiological researchers, e.g. with Prof. Alain Berthoz of at Collège de France in Paris. It plays an important role in the research areas of self-other perception and mechanisms of sympathy and empathy research and their disorders, e.g. schizophrenia and autism.

Hannes Waldschütz (DE)

Maschine, die auf Gott wartet

Microelectronics, glass, software, 2007

The *Maschine, die auf Gott wartet* ("Machine that waits for God") is part of a series of three "waiting machines." They were activated in Bremen on October 24, 2007, at 6:07 p.m. From this point in time the three machines had been in operation, the *Maschine, die auf Gott wartet* is still waiting. It's a microelectronic circuit, built and programmed in order to constantly inquire about the expected event: God must give a signal via a God sensor. An integrated backup power supply guarantees failure-free and uninterrupted functioning.

Laura Strasser

Rachel Smith (DE)

Cat: Collaborating with a Neural Network

This work is a conversation between Rachel Smith (human) and cifar10_cnn.py (artificial neural network). In order to communicate successfully, they must speak the same language. The method of communication is a human/machine compromise; a hand-painted grid of pixels. The human must automate and restrict herself, the network must cope with human error and bodily forms — colors mixed with naked eyes and brushstrokes. By engaging with a closed system, Rachel forces a dialogue where there would usually be none. In exposing the "hidden layers" of the neural network, extracting digital information and replacing it with an analogue counterpart, she is able to influence the final decision made by the machine.

TRANSCODE!

A call to fiction and to new translation processes of our reality

University of Art and Design Linz, Interface Cultures

Curators: Manuela Naveau, Fabricio Lamoncha, Maša Jazbec

"Is it possible that reality not only overtakes fiction, but precedes it, even anticipates it, in order to repair the damage that fiction will do in the first place?"

Umberto Eco, The Foucault Pendulum

We are told: Our world is changing, our ideas and needs are changing and we are changing. Dystopian visions of our future life on this planet face optimistic, mostly technology-driven promises of salvation and we are right in the middle, driven by powers and markets, desperately trying to orient ourselves. Lev Manovich postulated at the beginning of the new millennium that we should turn to computer science to understand the logic of the new media, the new logic of our world. He already introduced the concept of "cultural transcoding" and referred to the universal possibilities of language, translation and interpretation that computer codes provide in connection with corresponding devices and also to the cultural new conception that manifests itself through our thinking and language on the basis of ontology, epistemology and pragmatics of the computer. Manovich wrote his book "The Language of New Media" in a pre-Smartphone era. The question that arises almost twenty years later is: What importance is (still) given to transcoding, translating, transforming? In other words: do we transcode because we want to and because we develop the tools ourselves, or are we manipulated in this direction with superior tools? Transcoding, a term from computer science, is the invitation to our exhibition of young artists from the Interface Cultures department of Art University Linz on the one hand and to a possible active transformation of our thinking, functioning and "fictioning" on the other. Because transcoding in the conventional sense means the direct conversion from one digital coding to another, which usually does not take place without loss. But doesn't loss mean a limited way of seeing? A view based, for example, on values such as "the original", "the first and true"? What if we engage in a transformation process that respects the original but greatly appreciates the benefits of the new readability of the converted content? To what extent should a transformation not also question existing dispositives and not condition transcoding processes as well as imagination, the courage to fiction and the abandonment of reality and its security norms? Referring to Umberto Eco's cynical opening statement: Yes, it is possible! Because we trust in anticipatory knowledge and are subject to the misbelief of having to correct everything in advance that could happen to us in the future. We sacrifice our imagination to a dead end reality and feel at the same time empowered to do so. But don't we need fictions, illusions and thought constructions that can only be based on newly translated realities? Knowing that technology will not save our world, we call for unsecured transcode! The Interface Culture Department of the Linz University of Art and Design is celebrating its 15th anniversary within the 40th anniversary of the Ars Electronica Festival. Reason enough to embark on a comprehensive transformation process and to examine processes of transcoding in particular and in general in the form of an exhibition, performances and presentations as well as discursive approaches.

Text: Manuela Naveau
Christa Sommerer
Laurent Mignonneau
Manuela Naveau
Maša Jazbec
Fabricio Lamoncha
Michaela Ortner
Gertrude Hörlesberger
PRODUCTION/DESIGN TEAM: Isabella Auer, Sofia Braga, Wesley Lee, Onur Olgaç, Giacomo Piazzi, Antonio Zingaro
Supported by the Federal Ministry of Science, Research and Economy under the Higher Education Structural Fund Austria.
CURLY CABLE supported by Conrad.
A REACTIVE POETRY MACHINE realized with the generous help of Giacomo Piazzi.

Andrea Rebok (AT)

Curly Cable

The kinetic installation *Curly Cable* celebrates the presence, function, and aesthetics of spiral cables. Coiled cables arranged vertically side by side are alternately stretched by motor in order to be returned to their original contracted position at the next moment. Varying light projections, which meet the cables, enable various moments of shadow on the wall surface behind and create an exciting interplay between the immateriality of light and shadow and the material in between: the cables as a stylistic device and information carrier. The moving cables tell a story about a past in which there were no cables, a present in a cable-oriented world, and a possible wireless future. In an endless loop, the stretching apart and the contraction of the cables can be perceived. The play of light and shadow increases the visibility of the cables but also visualizes their slow disappearance.

Fabian Frei (CH)

A reactive poetry machine

The colorful slides of an old slide projector, the hum of its fan and the monotonous clicking of its feeding mechanism: This visual and acoustic experience is paired with an AI that creates poetry inspired by the images of the projected slides. The training of the AI is based on data collected by the artist in recent months from e-mails, SMS, poems and other text fragments. *A reactive poetry machine is* an experiment that examines the outcomes of trying to teach a machine poetry. Will it forever produce poetry in different variations of the same kind or will it succeed in crossing the threshold and creating something new? The interactive installation invites visitors to the Ars Electronica Festival to spend a moment away from the hustle and bustle of the festival to reflect on AI, poetry and their relationship. The installation has been realized with the generous help of Giacomo Piazzi.

Curly Cable

A reactive poetry machine

Amir Bastan (IR)

As promised

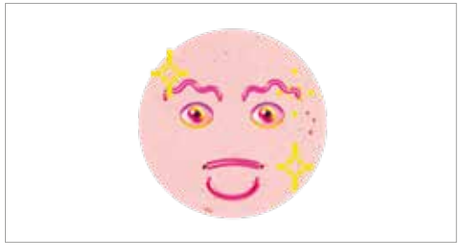
In Tarkovsky's *Nostalghia* Andrei meets and befriends a strange man named Domenico, who is famous in the village for trying to cross through the thermal waters of Bagno Vignoni with a lit candle. He claims that when finally achieving it, he will save the world. Before leaving, Domenico gives Andrei his candle and asks him if he will cross the waters for him with the flame.
As promised is an interactive installation which responds to the candle scene in Tarkovsky's

Nostalghia. In order to watch the complete candle scene, the user has to spin the anamorphic cylinder's cap, find the correct velocity and keep it constant.

Isabella Auer (AT)

Sausageface

Sing along with the never ending sausage song! Thanks to the magic of face-tracking, the seemingly free-floating holographic sausageface moves its lips and eyebrows exactly like the visitor's. The repetitive, almost childish sounding jingle lures you to the place where you suddenly become one with the cheesy singing slice of Extrawurst and realize that what you are looking at is an abstract portrait of yourself. Aren't we all just some stuffed casings in different shapes and colors? *Sausageface* is fun, annoying, catchy,

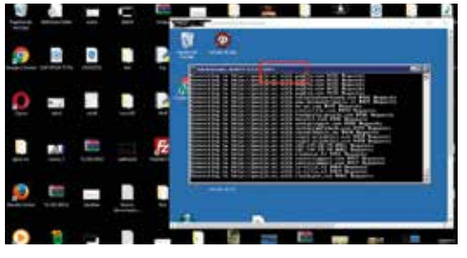


maybe also a subtle critic on ideals of beauty, consumer society and politics, but it's definitely a "valid form of abstraction," as Erwin Wurm once said in an Interview.

Stella Markidi (GR), Patricia Cadavid H. (CO)

Screenshot TV

Screenshot TV is an installation that invites visitors to watch a new genre of reality TV. Every few seconds, the TV shows another online screenshot, uploaded to a special website by anonymous people using a screenshot tool, so that the information can be shared by simply sending a URL. The URLs are usually sent privately, but are public and accessible to everyone. However, sometimes users upload screenshots that contain important and sensitive information and forget that the Internet is a virtual space with transparent walls. The artists appropriate this information and want to open a dialogue about our daily work and life on the



screen. A screenshot is a selection of information that represents us, what we focus on, what is important to us. With screenshots as a new format for live entertainment, the installation is an interpretation of the television genre. If the screen is our new reality, will screenshots become a new genre within reality TV?

Sofia Braga (IT)

I Stalk Myself More Than I Should

You are your number one stalker. *I Stalk Myself More Than I Should* shows a selection of Instagram Stories that have been documented and archived through the use of screen recordings. The work thus displays an archive of memories designed to disappear from the online platform within 24 hours. In contrast to the nature of this feature, the project explores forms of appropriation, interpretation and representation, as well as the qualities and hierarchies of collective memories shared and stored online.

Yang Mu & Sai Bao — Matthias Schäfer (DE), Sofia Braga (IT)

Meanwhile In China

Douyin 抖音, internationally known as TikTok, has become one of the world's most successful apps and a leading platform for creating and sharing short videos. It was developed by Beijingbased Bytedance and is one of the few apps that has been successful outside the big firewall. To comply with Chinese law, Douyin is a completely independent app from TikTok. Although the user interface and logo look the same, the content is completely different and not accessible in the international version. The goal of this work is to explore and analyze this vast digital ecosystem from different perspectives: screenshots capture a moment in a rapidly changing environment, determined by Douyin's artificially intelligent recommendation algorithm. These found images are then decontextualized without change to give visitors space and opportunity to think about them and gain insights into a delimited platform and its algorithms used to show you the most engaging content.

I Stalk Myself More Than I Should

Meanwhile In China

Jeon Hess (KR)

Insert & Play

Cassette tape players and slide projectors have long disappeared from the modern home. Many no longer collect bulky VHS tapes and expensive vinyl records and as a result, the interactions associated with these devices have disappeared from daily rituals: the act of insertion, removal, the physical play button, the separation between the media storage and the media player, the joy of anticipation when static TV screen noise turns into an anti-piracy warning screen, the confusion between side A and side B, the audible buzz and so on are no longer part of our everyday lives.
Insert & Play is a microwave that functions as a moving image projector to provide a viable media player. While the project is a celebration of technology and industrial progress, it is also a reminder of nostalgic actions; insert and play — a ritual between man and machine on the verge of extinction.

Onur Olgaç (TR)

SELLOUT

SELLOUT is a real-time game for two players. It is designed around the concept and dynamics of the Prisoner's Dilemma. Whether the players will cooperate with each other or sell the other one out is the core mechanic behind each round. In an iterated fashion the game is played multiple rounds, allowing participants to speculate on how their competitor is thinking. It intends to bring out strategies surrounding decision making in non-cooperative, non-zero-sum games.
Taking Robert Axelrod and his Iterated Prisoner's Dilemma tournaments from the 1980s as a reference, the installation aims to provoke questions on how self interest, human cooperation and trust are intertwined.

Wesley Lee (BR)

The Generative Adversarial Network

The Generative Adversarial Network is a series of products that pay homage to the gadgets that we all buy, own and love: the latest smartphone, wearable, IoT enabled home-automating wiretap.
Democratization of technology and information has not been the means of liberation and empowerment as it could have been. As described and discussed by the Frankfurt School of Critical Theory, these developments have been co-opted to become mostly a means of commercial exploitation. These manipulation processes have moved from mass media to the internet and to the smart devices that are pervasive in our lives. Even when we don't want them, it is impractical to function in society without owning and operating them. Adding insult to injury, not only are we exchanging our privacy, freedom and the health of our

planet to devices that bring us convenience and comfort, but also doing it to have access to useless features, many of which create new problems for us — so that we will need or want the next "innovation."

Bàlint Budai (HU), Maša Jazbec (SLO), Aleksandra Mitic (SR),
Jürgen Ropp (AT), Vanessa Vozzo (IT), Martìn Nadal (ES)

VR in Wonderland#1

Virtual Reality (VR) systems allow the user to experience a sense of presence in a place other than the physical body. VR also allows users to feel like someone else when they take the first-person perspective of another real person or avatar.
With the help of VR tools and devices for consumers integrated into our *VR in Wonderland#1* system, the perception of the body of the participants in another room can be directed to a new perspective. Consequently, the *VR in Wonderland#1* research setting actually makes it possible to manipulate the participants' physical perception through self-localization. The natural view of the participants is replaced by the vision of a small robotic device running in an abstract city labyrinth model. While wearing head mounted displays and looking around, users can observe themselves from the perspective of the third person from below and above, leading to confusion about self-localization. This is a common approach where bodily illusions influence bodily self-awareness.

Julia Del Rio (ES), Jeon Hess (KR), Sergio Lecuona (ES), Matthias Schäfer (DE), Qian Ye (CN), Julian Reil (AT), Kevan Croton (US), Jürgen Ropp (AT), Tamiko Thiel (US), Stefanie Brayer (AT), Fabian Pointecker (AT), Markus Maureder (AT), Peter Haas (AT), Horst Grobner (AT), Oscar Ablinger (AT), Dominik Heigl (AT), Christoph Muellner (AT), Elias Wipfler (AT), Christoph Anthes (AT/DE)

Triality

Triality is a cooperative mixed-reality experience presented as the result of a collaboration between students of the Interface Cultures Master Program (University of Art and Design Linz) and the Master Program Software Engineering and Human-Centered Computing (University of Applied Sciences Upper Austria, Hagenberg).
In a mysterious laboratory, three participants have to synchronize to solve pending tasks. Each player perceives only one sense of the same virtual character and controls it: touch, hearing and sight. To solve the problems, the players must work together as one unit to gain a complete understanding of what is happening in the virtual world.

Triality is an unconventional exploration of VR technologies that challenges the limits of our perception.

Patricia Cadavid H. (CO)

Knotting the Memory // Encoding the Khipu_

A Khipu is a device that was used in the ancient Inca Empire for the processing and transmission of statistical and narrative information. Linked to textile art, it is a tangible interface encrypted in knots and cords of cotton and wool. This system was widely used throughout the Andean region, until the Spanish colonization that prohibited and destroyed much of the existing Khipus.
This performance wants to pay homage to the Khipu, reusing it as an instrument for interaction and generation of experimental live sound and video. The artist will be a contemporary *khipukamayuq* (Khipu knotter) who seeks to encode the interrupted legacy of this ancestral practice through the knots. With each knot made, an audiovisual composition is constructed that yearns to vindicate the memory and indigenous resistance of the native peoples of the Andes.

Monica Vlad (RO), Johanna Falkinger (AT)

Che si può fare

When noise music and classical opera meet: Monica Vlad is an experimental audio/visual artist who creates a noise composition based on opera using a female soprano voice live interpreted by Johanna Falkinger. The structure is based on three different arias sung by her although these arias were not originally composed for this opera. Similar to the system of an Aria di Baule — a so-called suitcase or insertion aria — a singer is choosing the arias to be sung.
In addition, the sound artist Monica Vlad changes the orchestral accompaniment to electronic noise and the classical instruments are replaced by analog machines. The arias, however, are interpreted by the soprano as original.
The theme of this performance is based on feelings of melancholy, sadness, fear of loss, meditation and anger and how music can be used in any way to express and release these emotions.

Afra Sonmez (TR)

50 shades of forest

A textile as an electronic instrument: the artist specifically for this performance created a flexible and modular interface of electronic textile consisting mainly of snap fasteners to make all parts freely movable.
CoinB, the artist's alter-ego, is a version of the artist dressed in pinky and cutty which aesthetically is the opposite of her performance. The dramaturgy of the show is divided into three sections, beginning with soft experimental sounds representing the green and light side of the forest. The second part is the transition from the light side to the dark side, followed by the last part where the music escalates to speed core bpms.

Jaskaran Anand (IN/AT)

MachinedHuman!

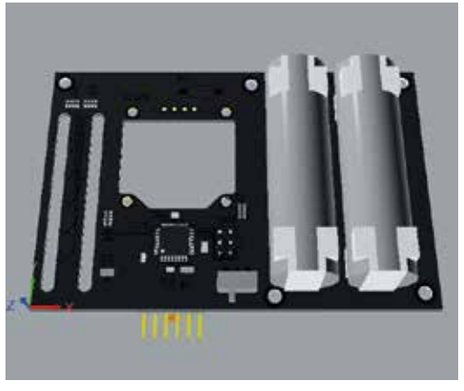
MachinedHuman! is a performance-oriented interactive installation that questions the existing. We are presented with an enthroned instance, apparently half human and half machine. The heart of this entity can be controlled by the functions of the mouse. It reacts to the movement of the mouse and the mouse click leads to a search for the essence. Only one person can interact with the entity, while the number of spectators is flexible. The audience is allowed to interact with the character by following instructions for the machine side of the instance. Moving the heart of the entity moves the entity. The viewers are also given the freedom to say a word in the ear of the machine, which means that the emerging dominance of the machine over the human being contradicts the artist as a human performer. The artist is convinced that in the end

the human mind, and thus the human being who is the creator of the machine, will always be the superior, similar to God's idea of man.

Technical Collaborator: Sergio Lecuona Special mention: Wesley Lee, Cesar Escudero Andaluz and Fabricio Lamoncha

Wesley Lee (BR)

IC-Decoder



Barcodes, QR codes, perforated papers, dot patterns, images: information is stored in various visual forms.
Those who know the code can also understand the information behind it. In contrast, abstract paintings, television screens with noise, random graffiti also carry information, but from which it is not easy and generally valid to extract information. These codes seem too complex and too personal.
For this year's exhibitions graphic design, we not only wanted to develop attractive aesthetics but also to provide an appealing visual code that can be decoded in order to transmit information. It is with this in mind that the IC-Decoder was created: a ludic exploration of decoding potential information from visual patterns.

Time Capsule — Narrations for a Future

Department for Visual Communication, University of Arts and Design Linz

Curator: Barbara von Rechbach

A time capsule is a container for the storage of things, with the purpose of preserving and documenting narratives. It allows a journey through time and is a special way to talk to future generations.
Time Capsule — Narrations for a Future explores a setting of contemporary archeology. We give an insight into present-day realities prepared for an unknown future.
The Time Capsule Archaeologists of the Present: What images, sounds, objects, fragments of life can be sent through time to tell a story? What artefacts of today can be rediscovered by future inhabitants or visitors of planet Earth?
The starting point for our design fiction activities was the time capsule Voyager Golden Record of the NASA Voyager Interstellar Mission in 1977, which extended the exploration of the solar system beyond the outer limits of the Sun's sphere and sent images and sounds of planet Earth on a journey into space. The data files were made in the hope that any intelligent, extraterrestrial life forms could learn of humanity on Earth and its position in the universe. In our time capsules, we update this narrative setting for a future mission into space with speculative design. These proposals preserve messages for an unknown audience.
Visual design fictions explore settings of hidden, invisible issues in media and design, optical objects and interactive experience. Time capsules are tangible futures about something past.
The Department of Visual Communication at the University of Art and Design Linz encourages personally motivated artistic research in the fields of communication design, media arts and photography. Students develop projects with a variety of media taking into account transmedia narration on questions of publication and visualization of content. The resulting works thus comment on the various conditions of our society. The study programs explore the interfaces between text and image as well as theory and practical work.

Department for Visual Communication, University of Arts and Design Linz; The project shows works supervised by Tina Frank, Marianne Pührerfellner, Gerhard Umhaller and Barbara Rechbach.

Lukas Bernhart (AT)

Alternative Energy?

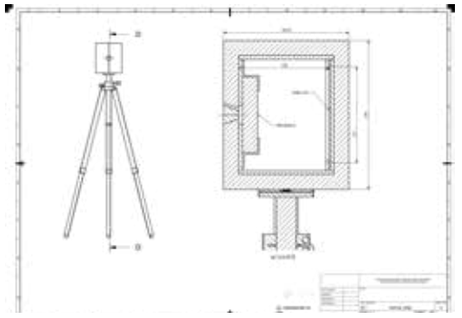
This project shows the risks of today's energy production and usage and questions nuclear power as a viable alternative to fossil fuels. Do we want to exploit the planet until there is nothing left to use or should we be risking thousands of dead and making large areas of the planet forever uninhabitable? *Alternative Energy?* investigates different energy concepts and design solutions in the Solarpunk movement.

"...whether with or without us, nature will always have the upper hand ..."

Christoph Breiner (AT)

In 100 years

In one of his last interviews, Stephen Hawking suggested that humans need to colonize a new planet within 100 years to keep our species alive. This camera has an exposure time of 100 years. It starts here at Ars Electronica Festival and you can be a part of the exposition for a last picture from our world. Do you accept being one of the last inhabitants on planet Earth?



Daniel Huber (AT)

Data Urns

Imagine a gadget which allows you to leave your legacy as an artificial intelligence. While you are still alive, you feed the neural network of an urn with personal data, which creates a replica of your own digital identity. It allows you to communicate with your previously determined heirs, expressing last wishes and passing on the digital heritage. This speculative design project poses questions of digital immortality, data transparency and human consciousness.

Stella Kucher (DE/US), Onur Olgaç (TR)

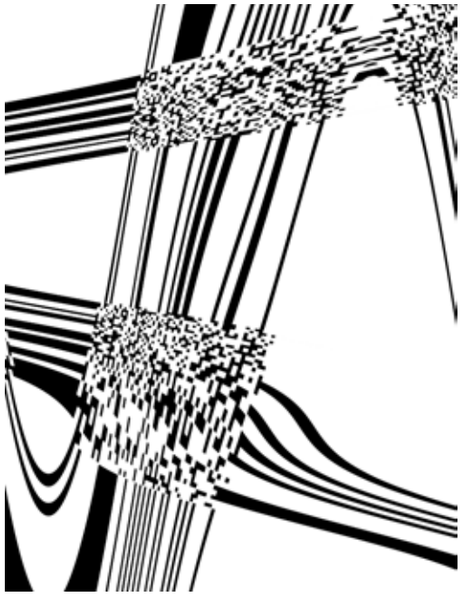
Lack of Time

Lack of Time questions existing time systems and shows alternatives based on event time. The interactive project aims to use *digital art* to create awareness of our society's dependency on clock time. At the same time, it should explain event time by using abstract visualizations to invite the user to interact. *Lack of Time* creates a non-timed space, in which the user has to take things as they come and is guided away from learned parameters and structures.

Anna Miklavic (AT), Vanessa Pichorner (AT)

Smartphone Archeology

Our smartphones look similar and have identical functions, but store different personal content: If you lose it, you worry about what the finder could do with all the data and information on it. Is not it strange that you attach so much importance to an electronic device, and is this behavior typical of our generation? How will we look back on our smartphone in 100 years? What could an analogue long-term archive time capsule of our smartphones look like?



Smartphone Archeology

Martin Märzinger (AT), Onur Arslan (AT)

Pictograms of the Future

We have created an alphabet for a near-future dystopian world in which the effects of climate change make life extremely difficult. People are living in protected habitats and get notifications on potential hazards and their levels of danger on special mobile devices. A new sign language offers instructions and protects us from the hostile surrounding environment.

Pictograms of the Future

Maria McLean (IT), Eva Weber (DE)

Script for Basic Human Encounter

A script can be a work instruction, a sequence of orders or a screenplay. The term also occurs in engineering and programming language. In the year 2019, we already seem to isolate ourselves from our surroundings and fellow human beings through and behind technology. At the same time empathy is blurred by ideologies and many problems result from a lack of understanding for others. This script motivates the reader to reach out and create interpersonal contact with other human beings.

Script for Basic Human Encounter

Navigating without a View

Digital Anthropology Lab — London College of Fashion, University of the Arts London

Curator: Maria Dada

In its second appearance at Ars Electronica and in response to the theme *Out of the Box*, the Digital Anthropology Lab presents its immersive installation *Navigating without a View*, a multisensorial experience that investigates the possibilities of orientation in a world without a map or a compass, a world without representation or established views or truths.
To orient ourselves, when guidance and direction become impossible, when we no longer have a blueprint to work from, we usually fall back on our senses. We rely on our sense of smell, touch, a visible landmark or the impression of a salient object in the distance. But in the digital realm our spatial embodied experiences, including our senses, are abstracted and altered. The body of the digital is a mathematical quantity, the number of heartbeats, the measure of blood pressure, the level of humidity. It's data. What are the possible interfaces required to orient ourselves in such a world?
For the duration of the festival, the exhibition will invite the audience to encounter various experimental interfaces that can guide us through the digital.
The Digital Anthropology Lab is an emerging research center dedicated to understanding the intersection of digital technologies with fashion, textiles and the body by critically applying design and coding practices.

Maria Dada (UK), Yuan Yu Chen Feng (VE), Maria Bika (EL), Costas Kazantzis (EL), Greta Gandossi (IT), Ragnar Hrafnkelsson (IS), Fergus O'Connor (UK)

Navigating without a View

Navigating without a View is an immersive installation that investigates the possibilities of orientation in a world without a map or a compass, a world without representation and established views or truths. When guidance and direction become impossible everything falls back on the senses. But what becomes of the senses when they are altered by the digital, quantitative and mathematical?

Into the Distance

MA Interaction Design Communication, London College of Communication, University of the Arts London

Curator: Wesley Goatley

At the core of a mid-life crisis is a reflection upon a past that seems to now be lost — of missed opportunities, failures, and near-misses. This can be a paralyzing process, a feeling of inexorable loss; but as L.P. Hartley said, "the past is a foreign country; they do things differently there."
In this exhibition, we are arguing for the future to be a place where we do things differently, and better, than the past. To see the past of the 'digital revolution' in the spirit of Hartley's quote is not to dismiss it; it is an opportunity to establish a new view of it, a chance to reflect upon its trends and failed promises from the vantage point we have in 2019. But we can extend our view further into the distance, both behind us and ahead; to explore how older (or ancient) ideas and concepts may be potent critical tools to explore challenges, both current and future.
The works in this exhibition engage with this context in multiple forms, from countering the narrative of the 'new and unknowable' nature of digital technologies, to engaging with the genuinely new ways they re-invigorate older narratives, beliefs, and problems. Through this we believe that a future relationship between culture and technology can be encouraged that focuses on individual and community empowerment, and the challenge to hegemonic power. By acknowledging what has come before, and enacting our individual senses of social responsibility, we hope to craft a propositional sense of what might be.
MA Interaction Design Communication at the London College of Communication delves into expanded and experimental design practices, exploring the intersection of physical and digital domains of design, through research, prototyping and provocation.
The London College of Communication is one of six constituent colleges of the University of the Arts London. Through our diverse, world-leading community of teaching, research and partnerships with industry, we nurture and develop the critical, creative and technical excellence needed to discover new possibilities and practices in creative communications.

This exhibition has been developed through the support of the London College of Communication, University of the Arts London.

Archie Wang (CN)

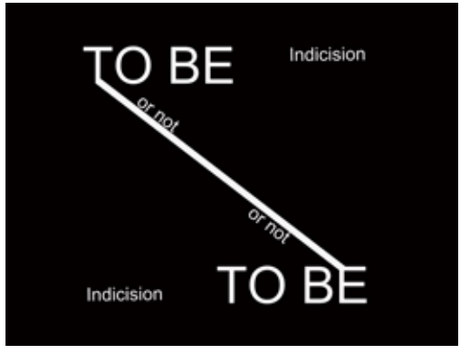
Queer.net

Based on the background of queer culture and inspired by different art forms, *Queer.net* is an explorative interactive design project examining what a queer aesthetic interface might be. By letting the audience explore the interface, this project presents possibilities for what queer interfaces may look like and could express. Using a range of different digital media, this project sings a hymn to the queer aesthetics and pushes the boundaries of their applications.

Carlos Orti Roig (ES)

Das ‘Smart’ Unheimliche // The Smart Uncanny

This project explores our relationship with daily-use AI consumer electronic products. It challenges the design techniques used to make AI products more ‘reliable’ and ‘comfortable’ from the consumer’s point of view. Three AI products have been re-aestheticised from an unheimlich (uncanny) perspective. By making the audience experiment with the ‘Anti-Alexa Experience,’ this project aims to promote socio-technical knowledge and introduce critical thinking towards daily AI products and services.



Hui Shan (CN)

To Be Or Not To Be

This project looks at contemporary complex decisions surrounding genetic editing of babies, in order to delineate the range of public opinion that exists at every stage of this topic. Through a web interface in the form of a decision tree and data visualization, the question of how an ethics committee might make decisions on how to genetically edit a baby is simulated and explored.

Jiayin Lao (CN)

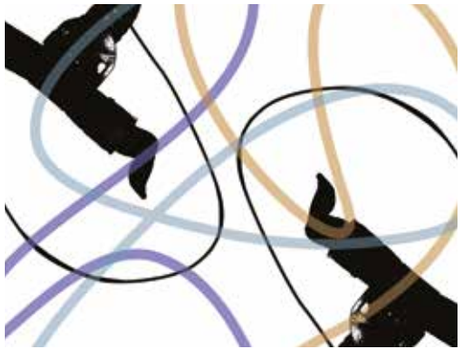
Artificially intelligent garden tool

This garden tool is a tool designed for the Green Gym, a community space where volunteers garden together weekly. They welcome people who have no basic knowledge about gardening, so the members have to share knowledge during the activities. However, since the members are voluntary, once the members leave the community, they take away their specific knowledge with them. This AI-enabled garden fork is an attempt to maintain this knowledge chain. The fork can be taught through machine learning and can teach newcomers the lessons learned about how to use it by those who’ve used it before.

Jie Liao (CN)

Social Shoes

This project is designed for the Parkrun group in London who run 5km every Saturday morning. Running has become a new opportunity for communication in people’s leisure time. These social shoes can enhance this connection. When people haven’t been running for a long time, the shoes urge them to move. When people put them on, the shoes will start looking for another pair of shoes to encourage people to run together.



Ke Wang (CN)

Imagination box

This work focuses on the SCP Foundation (Special Containment Procedures). This is a web-based collaborative writing group whose stories emerge from the same worldview. The pursuit of imagination is the firm ethic of the SCP, who fear that fiction will lose imagination. My work has designed 5 different types of cards according to the characteristics of the SCP, which players can use to generate different story elements for their work.

Joanne Leung (HK)

Jerry

A little mouse lives under your nose all the time. Its name is Jerry. He works and he plays. He loves and he hates. The computer mouse is entering his mid-life crisis as the floppy disc did. He evolves and turns his mid-life crisis into ours. This interactive mouse allows audiences to review their sense of control and superiority over other objects through spiritualizing a seemingly unspiritual machine. A story starts from an it and ends with a he.

Marta Roncero (ES)

Breath With Me

Inspired by ancient beliefs, my project proposes the idea of re-connecting to nature using our human energy. *Breathe With Me* allows us to connect with our plants through a meditation based in Hindu notion of Kundalini energy. Using physical computing this meditation starts with breathing, whose energy will provide water to the plant. In exchange, the plant will give back a vibrational tone that helps to raise energy in the body completing the meditation cycle. It visualizes the fact that we need nature to survive and therefore we need to give back to it.

Mich Tsai (TW)

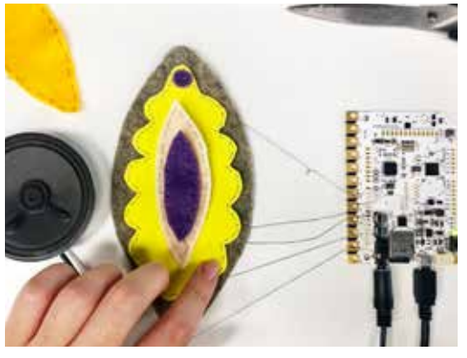
Yuan原

This interactive project offers audiences the opportunity to reflect on themselves, through reproducing traditional Formosan music via a perspective on the triangular relationship between machine, human and nature. Yuan not only represents Formosan musical culture, it also demonstrates the notion of 'LOSS' and the risk of cultural histories disappearing. Now, let's play it and hold on to what might be lost.

Qianlun Li (CN)

Joy on the wheels

This project engages with 'Outsiders,' an online meeting and dating platform for physically disabled people. For a long time, the sexuality of people with a disability has been often ignored. This project aims to encourage sexual expression in this community and healthy relationships through helping them explore their and their partners' body. The installation is a conductive touch board and a vulva model which gives audience different responses when they touch different areas.



Chenyu Zhou (CN)

Beyond Death

This project looks at transhumanism as a quasi-religion. Although this idea might be considered extreme, some transhumanists believe firmly that technology can transfer human attributes to machines which can enhance human physical potential and even extend longevity. *Beyond Death* uses immersive video to simulate what might happen when digitizing consciousness, inviting audiences to explore the notions of "human" and immortality.

ATMOSPHERE ©

Sean Terriblini (AU/US)

ATMOSPHERE ©

ATMOSPHERE © is a design intervention which explores the future potential of AI in new aesthetic dimensions by visualizing the anthropogenic pressures of urban environments such as air pollution. Through ritualistic interactions with a totemic object utilizing machine learning and a global network of air pollution sensors, the object is capable of forecasting air pollution levels 24 hours in advance, allowing audiences to re-interpret their faith in technology through a lens of technoanimism and divination.

Shifang Li (CN)

'Donkey' Mario

Some people think that digital technologies produce anxiety in us; does this mean we are less happy than our ancestors? Super Mario has been a classic video game since the 1980s. Traditional Chinese shadow play is a collaborative play that likely originated in the 1st millennium BCE. *'Donkey' Mario* shows the similarities of happiness between our ancestors and us through a shadow puppet theatre version of Super Mario.

Tiantian Xiang (CN)

The New Face of Physiognomy

Physiognomy is a discarded 19th-century pseudoscience. However, AI bias seems to be resurrecting it. Why is this happening again? This project investigates human trust in AI by exploring bias in facial analysis systems. It juxtaposes face analysis from AI mathematical models with judgements from the pseudoscience of physiognomy to draw parallels between these two biased forms of sense making.

Xintong Wang (CN)

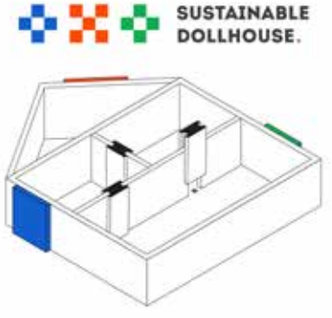
The Golden Age

The project aims to build a path for audiences to explore and understand empathy, both how it is designed and misused. The uncanny valley shows that to a certain extent, the more humanoid the form of a machine is, the more empathetic a human is. In order to test audiences' emotions towards it, I embedded the concept of the Golem into a radio by shaping it into humanoid form. Showing care and affection to the radio 'fixes' its broken state, exploring how we may feel empathetic towards nonhuman objects, and how this empathy has been designed.

Yulin Li (CN)

OXO

This dollhouse is a visual representation of a sustainable community, and aims to generate new insights into the future. It transforms the idea of green living from a small scale to a large scale that allows neighbors to negotiate and share resources. By inviting the audience to act as the coordinator of this system, it offers them the opportunity to explore the effective use of resources and avoidance of waste.



Anqi Wang (CN)

Making Monsters

This project aims to explore and discuss the combination of CCTV surveillance and machine learning. It invites audiences to consider this new paradigm in surveillance techniques by using cameras to detect and capture faces and process them in a deep learning Generative Adversarial Network. This network creates 'monster' images from their faces, suggesting how we are all at risk of being made monstrous by these technologies.

Bowen Yu (CN)

Murder On The Train

Spending time on a train is always so dull. I designed an online and offline cooperative detective game promoted on the train to help people enjoy their time on the train. Passengers join the game by scanning the QR code, upload the hidden information in the coach to the website with real time analysis, and enjoy the fun of solving the case together.

Making Monsters

Murder On The Train

Anya Wang (CN)

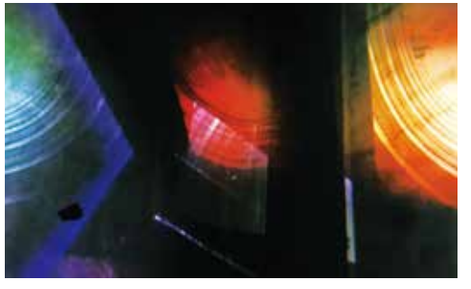
Dreama

Dreams are hidden in consciousness buried in the body. They are a form of psychic cinema, somewhat like a machine that triggers inner visions through electrical rhythms in the brain — but out of our control. This project does not attempt to control dreams but instead to bring this invisible machine to the physical world. It offers the audience an opportunity to think about a new way to describe dreams and the human obsession with control.

Ziyu Zhang (CN)

Captcha Candy Box

In daily life, people are unknowingly forced to contribute playbor to big corporations, which use it for their machine training or other benefit generating. In this project, I attempt to discuss the value of playbor behind Captcha. As users finish the Captcha tasks, candies are stored in the installation one by one, which visually represents the value of users' playbor. Also, this project aims to explore a new way to consider paying playbor contributors in the future.



Dreama

Captcha Candy Box

Spectacular Resonance

CCW, University of the Arts London

Curators: Jonathan Kearney and Lois Rowe

Exploring movement, time and sound, the first piece is an installation that involves analogue and digital interactions with the world around us. MA Fine Art Digital is a course that asks questions about what art is in a digital environment. Rather than focusing on specific technology, it allows students from incredibly diverse backgrounds to engage with significant issues through their art. Since 2004, this unique course has offered a fully online option for students living anywhere in the world while engaging with the studio-based students in London. The second piece is an experimental light piece that interacts with audience members by a BA Print & Time Based Media student. Print & Time Based media is a course that combines the traditional with the contemporary, bringing together print-making, photography, film, audio, writing, video and performance art.

This exhibition is co-curated by artists and Program Directors Jonathan Kearney and Lois Rowe from UAL and will showcase work from areas they oversee.

Cheska Lotherington (UK)

Perception

Perception is an experimental light piece that interacts with audience members. A thin rim around the edge of the room on the floor will project the light strips' color up onto the walls. Three cameras mounted to the ceiling will feed data to the light strips.

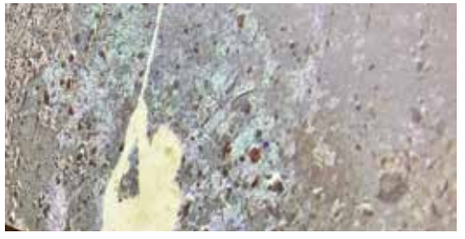
BA Fine Art Print & Time Based Media, Wimbledon College of Arts

Robin Weijers (NL), Manolis Perrakis (EL)

Found Sound Discovery

Found Sound Discovery explores movement, time and sound. An installation that involves analogue and digital interactions with the world around us. Through sensors and found objects, mechanical and digital interactions create the possibility of discovered sound.

MA Fine Art Digital, Camberwell College of Arts



Manolis Perrakis (LE) in collaboration with Mathis Antony (CH)

I am {Emotion}

The installation is comprised by a sun lounger bed that the audience can lie on, and receive real-time "psychological" advice. GPT2 in conjunction with tacotron2 and an emotion classification algorithm is used to extract the emotion from the participant's face and vocalize it into an endless stream of artificial wisdom.

SANDBOX (R)EVOLUTION

Media and Arts Technology Centre for Doctoral Training at Queen Mary University of London

Curator: Dr. Nick Bryan-Kinns

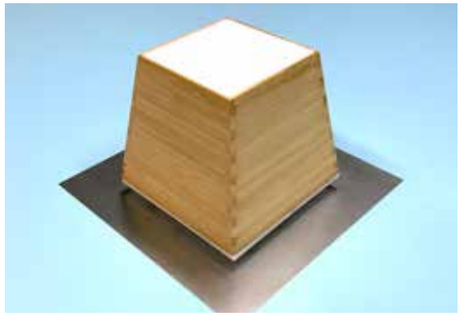
SANDBOX (R)EVOLUTION showcases ten interactive installations that have evolved under the theme of new or pre-loved materials, repurposed as interfaces for manipulation of digital realms. It is a playground of innovative technology in which familiar materials such as wood, fabrics and magnets generate visceral experiences, blurring the boundaries between real and imaginary, hard and soft, fact and fiction.
The exhibition's namesake, sandbox, is both a reference to the physical place where children create imaginary worlds and the digital sandbox used in software development to test new code. The sandbox is a place where ideas originate, where physical and digital materials are combined, shaped and repurposed. We invite you to enter the exhibition to encounter obscure objects in a playful environment, perform peculiar sounds, and reflect on the Ars Electronica 2019 festival theme "Out of the box" from a place where alternative futures are possible.
The exhibiting artists are part of the EPSRC+AHRC Media and Arts Technology Centre for Doctoral Training at Queen Mary University of London, UK, which provides a bridge between academic research, digital technologies, and creative industries.

EPSRC+AHRC Media and Arts Technology Centre for Doctoral Training (EP/L01632X/1)
Queen Mary University of London

Andrea Guidi (IT)

Data Dreaming

Data Dreaming is a multimedia performative installation driving nuanced gestures to create ethereal audio-visual compositions with an interface resembling a household lamp. Rather than addressing functional requirements, the wood pyramidal object invites viewers to explore and compose enchanted sonic textures and fictional visual renderings. Inspired by the internet of things (IOT) technological shift, the installation depicts an alternative future where household appliances and data are elicited for creative purposes.



Jelena Miskin

Angela McArthur (UK)

Rumpus

Rumpus is a cinematic VR film made in collaboration with the BBC. It follows a modern-day Eurydice as she searches in London's clubland underworld for Orpheus. Visually decadent and thematically magical, the film's imagery is counterpointed with a form of sonic voyeurism and ambiguity in sound-image synchresis. The over-hearing of intimate dialogue, the seemingly out-of-context sonic bytes caught in passing, the hyper-real details of sounds within noise. To experience the film, you must enter into the unavoidable world of voyeurism which headset-viewing requires.

Alia Sheik

Anna Nolda Nagele (AT)

Machina Incantatii

The work *Machina Incantatii* is a wall hanging made of conductive yarns and fabrics that combines physical and representational materials into an interface for a magical ritual. By touching the conductive patches on the cloth, powers assigned to the elements of this world and energies of the universe are called upon to generate new knowledge and meaning. The "old" periodic alignments of the stars are a poetic parallelism to the "new" periodic alignments of the Markov chains used for casting a spell and generating an incantation.

Brendan O'Connor (IE)

Sound Stitcher

Sound Stitcher comes in the form of a 100-year-old sewing machine. Although it no longer functions as before, participants can still interact with its variety of controls to design noise instead of cloth. With each interaction, the acoustic properties of sounds generated by the piece become mangled and distorted beyond recognition, paying homage to the battery and abandonment these discarded pieces of machinery have endured over the years.

Antonella Nonnis (IT)

Ολοι

Ολοι (pronounced Olly) from the Greek "all" is a tangible sonic interface made in felt and stretch lycra. The idea was that of creating an orchestra where different instruments are activated by pulling the colored stretch lycra. Each instrument plays a different scale of notes. When the lycra strings are pulled together, the sounds form a soothing composition and the users are able to create different harmonies. The work was developed to stimulate social interactions during play time with Ολοι for a group of five minimally to non-verbal children with autism who like music.

Giacomo Lepri (IT)

Chowndolo

The *Chowndolo* is an interactive sonic sculpture based on a magnetic pendulum: an oscillating stick whose trajectories are altered by magnets placed underneath the device.
The unstable patterns produced by the pendulum oscillations are transformed into sound, articulating music which evolves based on the pendulum motions. The magnets at the bottom of the pendulum can be arranged to compose new shapes. Different configurations will therefore modify the pendulum oscillations and the sonic patterns.

Jack Ratcliffe (UK)

Keyboard + Mouse

If the medium is the message, then in an age of cyber-bullying, trolls & great political divides, is it time to consider the impact of the interfaces of our online communication? This piece, an interactive keyboard and mouse made using 100% natural wool, invites the audience to experience whether the softening of our hardware could soften our harsh communication edges. Could replacing plastic, metal and glass (the ubiquitous materials of online interaction) with natural, gentle, tactile, transient alternatives, allow for more humanity in our digitality?

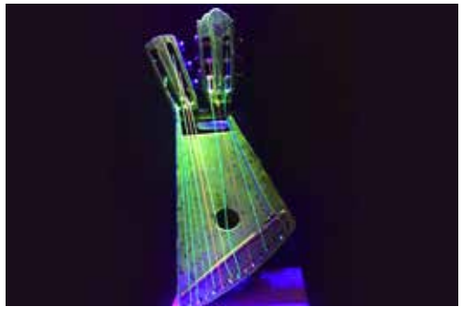
Nicole Robson (UK)

Rhythm of the Heart

Inspired by artistic activities that bring new life and meaning to everyday objects, *Rhythm of the Heart* is an interactive installation that repurposes a metronome to move in time with our heartbeat. It reverses our relationship with the object and exacts a kind of revenge as the metronome fights against its pendulum mechanism to swing in time with our internal rhythm. At the same time, the tempo of an accompanying song by dance band Stats fluctuates with your heartbeat as you breathe and move.

Lia Mice (AU)

INSTRUMENT SEMATARY



INSTRUMENT SEMATARY is an interactive sonic sculpture created from broken, pre-owned classical instruments that have been brought back to life with a new digital identity. Inspired by Stephen King's *Pet Sematary* in which deceased animals return to life with unfamiliar, evil personalities, this work explores the environmental choices of musicians and instrument designers, and our responsibilities to preserve historical handcrafted musical instruments that are becoming increasingly out of fashion in a digital age.

Sebastian Löbbers (DE)

BLOBBOX

Using computers, smartphones and other electronic devices has become a crucial part of daily life. But how do we interact with our devices? How might they become a more intuitive extension of ourselves? *BLOBBOX* is an attempt to imagine an alternative narrative where hand recognition becomes the predominant interface. It asks how applications, images and code might look and function beyond traditional computer models. This experiment is demonstrated by a transformative, playful yet eerily ambiguous blob, which, in its undefinable materiality and sterile container, alludes to a laboratory that must test new materials through simulation.

Lia Mice

SIX MOVEMENTS

Design for Performance and Interaction, Interactive Architecture Lab, The Bartlett School of Architecture, UCL

Curators: Fiona Zisch, Michael Wagner, Dr Ruairi Glynn

The Interactive Architecture Lab at the Bartlett School of Architecture is interested in the behavior and interaction of things, environments, and their inhabitants. We are engaged in a range of academic research activities and industry collaborations. At the heart of the Lab is our 15-month Masters program MArch Design for Performance & Interaction which gives students an opportunity to explore the potentials of new sensing, computation, networked, and responsive technologies to imagine, build, and test new spaces of performance & interaction.
"Look only at the movements — and they will bring you to matter." SIX MOVEMENTS showcases six individual student projects centered around different types of movement. The work takes a critical stance and reflects on past and current developments across art, science, and technology to spearhead thinking on emergent themes of the 21st century. The works presented are physical and virtual prototypes that enact cybernetic and performative approaches to the design of immersive and interactive environments. In the spirit of Cybernetics we take an "antidisciplinary" attitude to our research, breaking boundaries between art and science, particularly between fields of architecture, performance, interaction, and psychology. The breaking of these classical enclosures of specialized practice reveals rich new territories of practice to address our changing social, ecological and technological landscape.

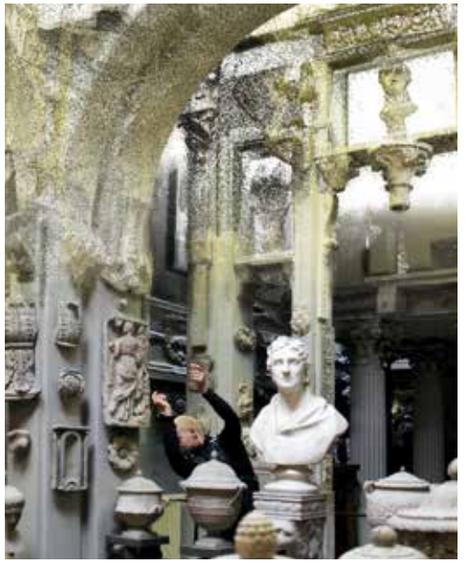
www.interactivearchitecture.org/dfpi
Program Director: Dr Ruairi Glynn
Principal tutors: Jessica In, Fiona Zisch, Paul Baviste

Ava Aghakouchak (IR)

SOVAR

Sovar is an active soft wearable that maps certain architectural elements on the wearer's body. The cross-modal mapping of the space on the user's back directs their attention to their surroundings and increases their sense of presence within a space. *Sovar* can be used as a tool for navigation, a choreographic device for networked performances, or a tactile amplifier for VR spaces.

Designer: Ava Aghakouchak
Supervisors: Prof Stephen Gage and Dr Christopher Leung
Special thanks to: Fiona Zisch, Ruairi Glynn, and Scan Lab Projects



The Entangled Eye

Sounds, and sweet airs

Anne-Héloise Dautel (FR), Irem Bugdayci (TR), and Robert Wuss (USA)

The Entangled Eye

The Entangled Eye is an exploration of visual perception through robotic motion. Luna and Laika are two robotic creatures with curious and animate behavior programmed to elicit your attention. As the whimsical creatures chase your eyes with unique kinematic expressions, the direction of your gaze orchestrates a conversation.
The indeterminacy of attention coupled with the animacy of kinetic movement constitutes the basis for our attempt at reconfiguring and understanding the perceptual experience of behavioral artefacts and animism.

Designers: Anne-Héloise Dautel, Irem Bugdayci, Robert Wuss; Tutors: Jessica In, Ruairi Glynn, Parker Heyl, BMade Here East UCL

Kornbongkoch Harnpinijsak (TH), Weichen Tang (CN), Nong Hua Lim (MY)

Sounds, and sweet airs

Natural soundscapes provide a tremendous range of auditory cues about the state of the environment and its inhabitants. The technological environment has not evolved to create a comparably symbiotic system where humans and other inhabitants coexist, using a range of synchronized communication channels. This sensory design project reflects on natural sound ecologies to create a synthetic environment around human-technology interaction. It encourages us to rethink our relationship with the environment.

Designers: Kornbongkoch Harnpinijsak, Weichen Tang, Nong Hua Lim; Tutors: Paul Bavister, Felix Faire, Fiona Zisch, Alexander Whitley, Luca Dellatorre, Ruairi Glynn, Michael Wagner

Danniella Vizcarra (PER), Claudia Cortes (MEX)

Lumina

Lumina is an interactive installation that aims to generate a sense of presence by exploring the personal and peripersonal space of the user. The instrument reflects interactive boundaries of light drawn by our bodies. The intensity, color, and shape of the boundary is modified when the user extends or retracts their arms. The aim of *Lumina* is to examine the mental and physical boundaries that the human body creates in physical reality, seeking to explore how these boundaries shape individual behavior.

Designers: Danniella Vizcarra, Claudia Cortes
Design support: Qiuyan Da
Tutors: Fiona Zisch, Alexander Whitley, Dominik Zisch, George Adamopoulos, Parker Heyl, Michael Wagner

Danniella Vizcarra

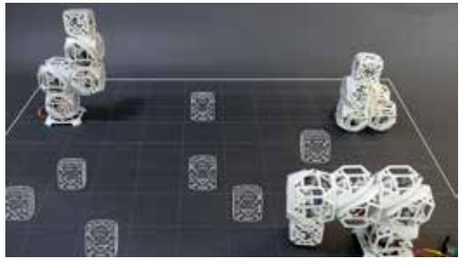
Lumina

Kongpyung Moon (SK), Peng Gao (CHN)

CuGo

CuGo is a board game where humans interact with modular robots (H-RMR). As a platform for people and robots to collaborate, *CuGo* not only encourages players to observe and understand how the multi-axis RMR robots behave, but also how they might be utilized. *CuGo* also opens up questions about the role of humans within environments populated by autonomous agents.

Designers: Kongpyung Moon, Peng Gao
Tutors: Jessica Inn, Ruairi Glynn, Dominik Zisch, George Adamopoulos, Parker Heyl



Peng Gao

CuGo

Saria Ghaziri (FR/LB), Dalia Todary-Michael (CA/EG)

In Rhythmic fragments

“It was but yesterday I thought myself a fragment quivering without rhythm in the sphere of life. Now I know that I am the sphere, and all life in rhythmic fragments moves within me.” — Khalil Gibran, *Sand and Foam*. *In Rhythmic Fragments* is a biophilic spatial installation that translates mensurated motions into kinetic architectural boundaries. Inspired by the rhythmic flows of energy observed at varied scales in the natural environment, the installation aims to engage our mind with contemplative content to evoke the sense of being mesmerized.

Designers: Saria Ghaziri, Dalia Todary-Michael
Tutors: Fiona Zisch, Alexander Whitley, Ruairi Glynn, Parker Heyl, Dominik Zisch, George Adamopoulos

Saria Ghaziri

In Rhythmic fragments

Sounds of the Earth

Ladislav Sutnar Faculty of Design and Art, University of West Bohemia

Curator: Vojtěch Domlátil

Examination of two different media with two different approaches by two students of the Ladislav Sutnar Faculty of Design and Art. Experimental videos exploring the fascinating world of hidden sounds and hidden visual elements such as video compression. And a comics wall inspired by mythology juxtaposed with contemporary CGI technologies.
The Sutnar faculty is located in the heart of Europe, in Pilsen, a city made famous by the Škoda brand and the world's best beer, Pilsner Urquell. Its students earn bachelor's and master's degrees in a wide range of twenty programs, focusing on design and applied arts. It is located in an original building with state-of-the-art facilities and a number of unique studios and bases its activities and philosophy on the inspiring legacy of Ladislav Sutnar, a famous native of Pilsen and world-renowned designer.
The school boasts a team of prominent artists as teachers, under whose leadership its students achieve success in international competitions, undertake projects in collaboration with businesses, and take part in many exhibition projects.

Zbyšek Semelka (CZ)

Earth Radio

Experimental videos focusing on things that are hidden: the naturally occurring electromagnetic radiation in the atmosphere, differences of video compressions so the final artwork is the compression itself, visualization of a traffic landscape, and expression through structures and patterns.

Tomáš Červený (CZ, SK)

Havoc

A mythological comics wall exploring a combination of contemporary CGI technologies with the topics of heroic epic tradition, kitsch, pathos, violence and mythology. What is "violence"? What is "justice"? What does it mean to be a "hero" and what is the hero's mission in society? These are the questions the author raises in his digital tapestry *Havoc*.

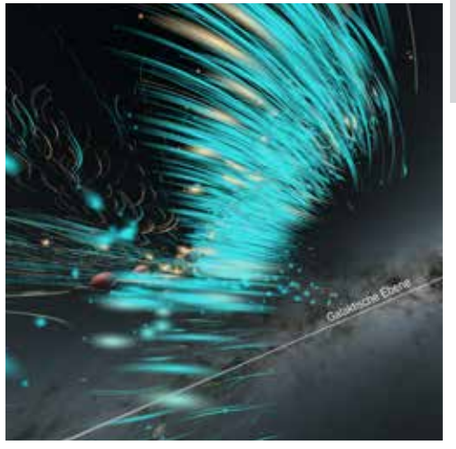
Light

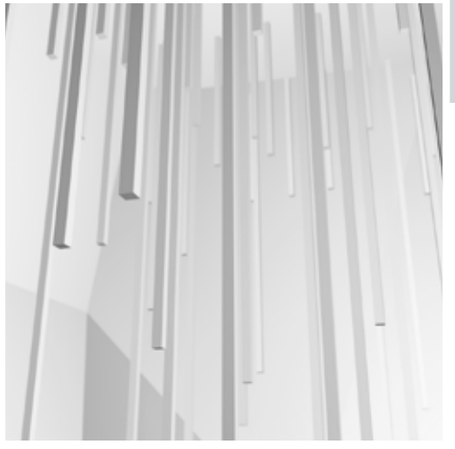
University of Applied Sciences Würzburg-Schweinfurt, Faculty of Design

Curator: Erich Schöls (DE)

Light in its essence is not perceivable. Only in combination with shadow can humans experience it. It is therefore often used as a symbol for the immaterial. While the sciences explain light as a physical phenomenon, it is used metaphorically for very different contents in the humanities. Both concepts provide interesting impulses for entirely diverse approaches to projects. In this course, we looked into the subject "light" in form and content in a very versatile, innovative and experimental way.

This project makes use of data produced by the EXTraS project and *safecast.org*.





Annika Kreikenbohm (DE)

Tangible Universe

In the study of the universe, light is the one of the main sources of information accessible to us. Using satellites and telescopes, we collect the light of astronomical objects. First, each object appears as a single cloud of light. In the closer analysis of light, we recognize its nature and can distinguish stars from galaxies. In the virtual environment, numerical satellite data is translated into light sculptures and light is made tangible by haptic stimuli.

Benita Martis (DE)

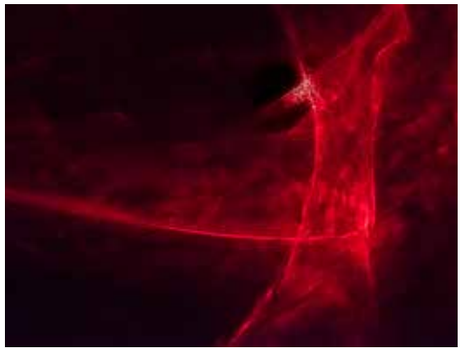
Luminescence

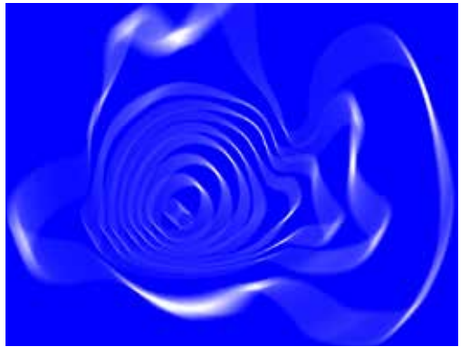
In virtual reality (VR), light does not have to correspond with our reality. Physical laws can be overridden and redefined. This raises the question of how light looks, what effect it achieves and how it can be perceived in virtual reality. Can light in VR achieve a meditative effect? Can light take shape? Does light have the same meaning in virtual reality as in real reality? Luminescence is an experimental virtual experience which plays with forms, contrasts and biological feedback.

Katja Volk (DE)

Silent songs

Light is a matter of course for us. Its functionality in everyday life and technology makes it easy for us to overlook its simple beauty. Light is fascinating. Not only physically, but also visually. Silent Songs uses light as a medium. Small, interactive light boxes create a sensual moment in which the viewer can concentrate on the light. This draws pictures in its very own way.





Lukas Woerm (DE)

Color Impression

Light. Light is boundless and dematerialized — it is intangible and enables our primary perception, seeing. A contourless, monotone space filled with light forces our brain to cope for a short time without this visual input. Orientation and lack of dimension are the consequences. Light, color and space become one.
A non-objective environment makes human perception the object of contemplation. How is our emotional being influenced by light and colors?

Michaela Lautenschlager (DE)

Lucky Island

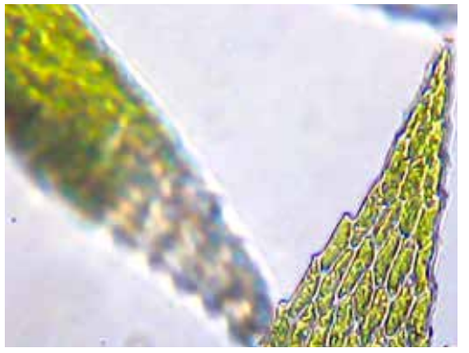
Outside our visible spectrum of light, there is a very big area of electromagnetic radiation. Scientifically, that is also light, as it consists of photons. The most dangerous part for the human being: gamma rays. They are characterized by a very small wavelength and permeate almost all materials on earth. We cannot see them and generally only notice them when they are linked to radioactivity; for example, when we deal with the consequences of atomic bombs and nuclear accidents in power plants. In this project I don't want to downplay the dramatic effects of being exposed to this radiation but I want to help

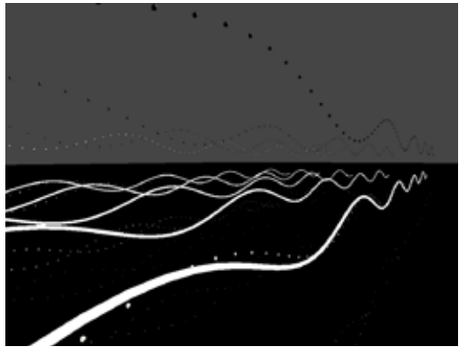
people understand it better. Therefore, I used the principle of sonification to make live measurements of monitoring stations in Japan "audible."

Theresa Vogt (DE)

Hortus Luminis

Photosynthesis is an elementary part of everyday life. Nevertheless, our esteem for plants and other phototrophic organisms is limited. This may be due to the fact that most of their biological procedures are not visible to the naked eye. But they can be experienced through a microscope. Hortus Luminis creates a new level of interpretation that deals with the hidden energy of plants and other organisms. The application uses the data from an analogue microscope to grow digital plants.





Anne-Sophie Schmidt (DE)

Rays

Rays is a VR environment designed to get viewers excited about the physics of electromagnetic waves. With a self-designed ring as controller, the user can hunt for the information himself. Other interactions, such as changing the frequency of the wave, demonstrate the properties of the different wave types and are illustrated by dimensions that represent the wide bandwidth of the wave dimension. Immerse yourself and explore the invisible radiation surrounding you.

Benedict Falkenstein (DE)

Modeling Color Spectra

Each picture consists of many individual colors. Based on the RGB color space, I created a virtual reality application that shows a three-dimensional shape of the color spectrum of the image. This object can be moved and deformed by users, who can then see the changes they made to the picture. This direct link between the image and the three-dimensional color space gives the user a completely new perspective on colors and their location in the RGB color system.

Kari Massey (DE)

Lucifer

Lucifer is a small robot, which reacts to light and gives light. If Light were a living thing, how would we encounter it? How would we communicate with each other? With 3 joints, 3 degrees of freedom, Lucifer is able to react with a wide range of motion. He addresses us with his movements. How do we react to this feedback? He brings light and he seeks light. Do we accept his offer? Or will we try to take away the light he seeks? An experimental reflection on human behavior.

Lars Schrodberger (DE)

Lichtzeichen

Language is the key to human communication. Ever since the invention of letterpress and book printing, humans have been fascinated by type and language. However, the written language has lost its magic over the years. That's why I want to bring back life to the magic and mysticism of type and language. In order to achieve this, I created a machine for translating and interpreting written words, texts or single letters into emotional and abstract light signals.

Max Seeger (DE)

Artificial Light

How does a neural network learn to see and how can we shape the perception of artificial intelligence? In a very experimental and fundamental manner, this project tries to study perception and recreation of light phenomena by artificial intelligence.

Define Sentience

MA Interactive Technologies of Performative and Media Arts, CINETic (The International Center for Research and Education in Innovative Creative Technologies), University of Theatre and Film "I.L. Caragiale," Bucharest, Romania

Curator: Alexandru I. Berceanu

Define Sentience explores the impact of technological advancement on human emotions and social interactions. The project is the result of research conducted at the International Center for Research and Education in Innovative Creative Technologies (CINETic) in Bucharest. CINETic's mission is to develop knowledge and to innovate at the international level in the fields of performing arts and film, as well as in the fields that lead to their growth and transformation. The knowledge acquired in theatre and film is expanded through research within interdisciplinary projects that bring together art, science and technology. When it comes to robots and AI, techno-skepticism and dystopian discourses have been at the forefront of popular culture for the past decades. Hollywood movies embody the public fear of artificial machines taking over the world and exterminating humans (or at least humans as we know them). This project joins the debate on sentient machines and how they fit in today's context and social order. Machines becoming sentient may lead to the necessity of including them in the category of personhood where members enjoy rights, freedoms and protection under the law. This leads to an ethical discussion regarding the development of sentient machines. Is humanity holding back on acknowledging emotions in machines in order to keep this new species at a subordinate level? The attempt to engineer consciousness might help humanity gain deeper insight into the background of this phenomenon.

CINETic International Center for Research and Education in Innovative Creative Technologies), Proiect B

Dorin Cucicov (MD)

I Am Here

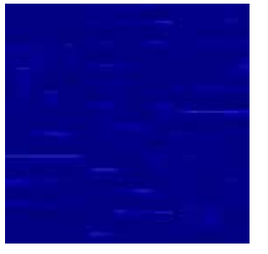
I Am Here is an interactive experience powered by human interaction. An ambiguous digital presence invites you to an exploratory dialogue. How well can you understand the entity and its intentions? Does the movement influence the digital form, or does the form dictate your movements? *I Am Here* explores the possibilities of outsourcing human personality to digital forms. It attempts to blur the differences between interhuman and human-computer interaction.

Maria Năstase

Dorin Cucicov (MD)

Sentientia

Sentientia attempts to reconstruct the experience of a sentient creature that learns to interact with the external world. Inspired by Dr. Frankenstein's creature, *Sentientia* sends audio signals to its environment and waits for a response to establish an emotional connection. Emotional combinations are generated by the machine and transformed into sound. Once the system understands that it has a mind and is conscious of its surroundings, will it start looking for entities like itself to create social networks of emotional intelligence?



VALIS

Digital Research Unit in Art and Design at the Esad Saint-Étienne/ Ensba Lyon

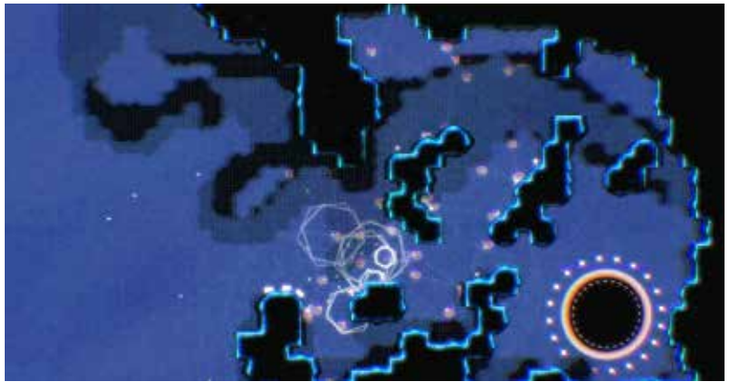
Curator: David-Olivier Lartigaud

The works presented in the context of this exhibition were created by the artists/designer-researchers (post-master level) of the Digital Research Unit in Art and Design at the Esad Saint-Étienne/Ensba Lyon. This Research Unit, which is unique in France, has the particularity of structurally bringing together two schools to explore questions of digital art and design.
Located in Auvergne-Rhône-Alpes, this Research Unit includes the Random(lab) of the Esad Saint-Étienne (www.randomlab.io) and the NRV lab of the Ensba Lyon (www.labo-nrv.io).
With the support of the French Ministry of Culture, the research unit currently hosts nine students and three guest researchers, who develop projects whose "raw material" is digital culture in its societal, aesthetic, political and technical sense. The Digital Research Unit can host international students and researchers.

For this first presentation in the framework of Ars Electronica, we chose to explore concepts of "science-fiction," considered as a domain that provides forms but also imaginary elements to be renewed. The exhibition presented here is therefore a first approach which summons various references to fields such as archeology, music, robotics or video games, passing through several experiments with media (code, 3D, sound, performance, deep learning ...). *VALIS "Vast Living Intelligent System"* is a reference to the late work of Philip K. Dick.

Digital Research Unit in Art and Design at the École supérieure d'Art et Design of Saint-Étienne / École nationale supérieure des Beaux-Arts of Lyon.
http://www.randomlab.io/
http://labo-nrv.io/
https://esadse.fr/fr/la-recherche/171012-laboratoire-random-lab-
http://www.ensba-lyon.fr/page_ur-numerique

Listening capsules (light version)

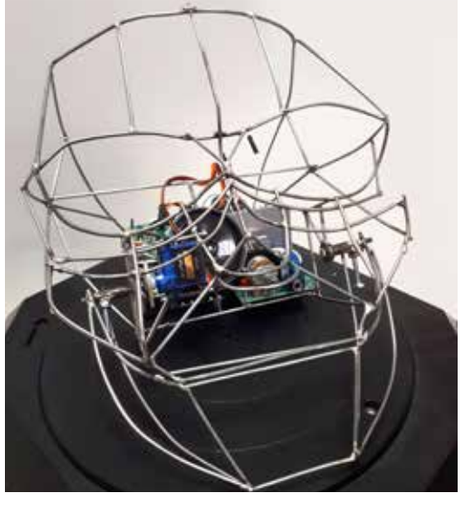


Ultimate Cavefighter in outer space : SC Deluxe Multiplayer Edition

Kévin Ardito (FR)

De toujours tu seras l'antépénultième peril

This sculptural and musical installation diffuses cover versions of Billy Joel's song *Honesty*. It uses digital and robotic media to question our relationship with transparency and lies in an entertaining and mischievous way: skull-shaped robots singing a song about honesty.
The recorded voices lend some warmth to the robotic coldness of the artwork by adding an organic element to the robots, blurring assessments of identity or the reasons for their presence. The background simulates an Aurora Borealis, which is reflected on the skulls and the surrounding environment.



Thomas Barbé (FR), the Random(lab)

Listening capsules (light version)

Our body is a tactile receiver of all musical waves: we perceive them through our skin, muscles, nerves, bones, etc. The *listening capsules* immerse the viewer in "somesthetic" compositions generated live by an algorithm. The intention is to take the listener out of his usual sound environment in order to invite him to renew his listening experience. These waves, sinusoidal frequencies, are composed and synthesized generatively by a software specifically developed for the installation, the sinoto.

The listening capsules is a project by Thomas Barbé in collaboration with the Random(lab) [Damien Baïs, François Brument, David-Olivier Lartigaud, Jérémie Nuel, Jacques-Daniel Pillon and Lucile Schrenzel] Production: Internationale Design Biennal Saint-Étienne 2019 and École Supérieure d'Art and Design Saint-Étienne.

Damien Baïs (FR), Thomas Barbé (FR)

Ultimate Cavefighter in outer space : SC Deluxe Multiplayer Edition

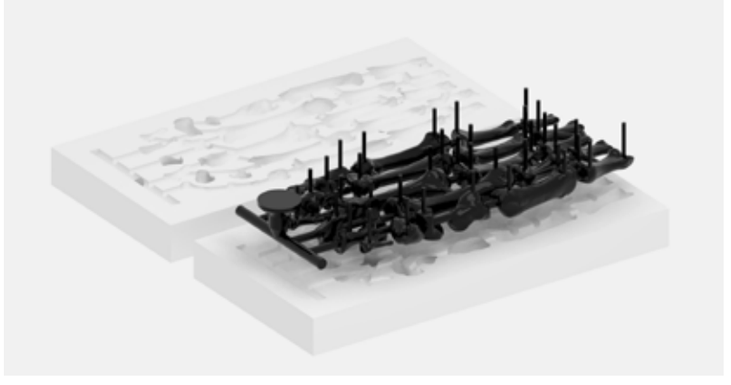
The final assault has begun! In the bowels of a dark planet, you have to destroy the ultimate evil. But to succeed in your quest, you need to develop collective strategies to defeat opponents. *Cavefighter* is inspired by the "fixed shooter" video games of the 80's. To enter the game, the player must connect to the "Cavefighter" WIFI network and download the *Cavefighter* application (Android only) that serves as a joystick.

Designer: Damien Baïs
Sound composition: Thomas Barbé

Alain Barthélémy (FR)

Ether

Ether is a video presenting a technical device producing the 27 bones of the right hand. This 3D animation, which resembles a didactic document, seems to be promoting an innovative technology.
There is certainly a rapprochement here with vanity. However, if the classic subject of art history is intended to present the irony of human existence trapped in a putrescible body, the vanity here would be that of a cyborg, a being who seems to be able to escape the ravages of time.



Ether

Lorène Ceccon (FR)

Sas (Social Adaptation System)

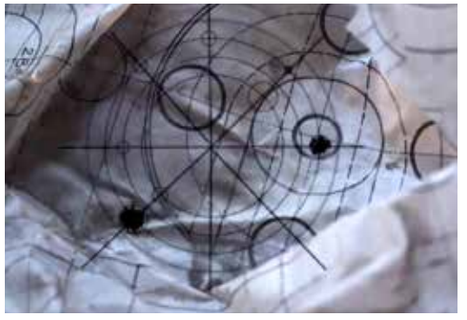
Today, good mood is the *sine qua non* condition of the terrifying “soul of the company,” and inconsistency of mood is deemed unacceptable. Starting from the *digital shift* of the French Labor Agency, *Sas* is an extravagant AI which establishes an impossible dialogue with the spectator. It underlines the absurdity of automation and the normalization of our feelings, but also our confidence in a computer system that does not know what it is calculating.

Sas (Social Adaptation System)

Alix Desaubliaux (FR)

Sigils

In *Sigils*, a speculative archeology takes place in an abandoned metal factory. Industrial blueprints gathered on the spot as well as exchanges between engineers and commercials, clients and operators host new fictions where obsolescence sets up a magical dimension. From those clues and artefacts, several videographic and plastic objects are conceived: aluminum sheets laser-engraved with magical inspired drawings, generative sounds made by converting the blueprints into audio specter, and video exploration of the place.



Ophélie Demurger (FR), Valentin Godard (FR)

Sensory autonomy

A microphone recorder has slipped in between whispers and the ear canal. Those who operated from afar are now before your eyes: the humanoids of BoTaG are there for you. Enigmatic and secret creatures, they then return behind their screens, for a filmed ASMR session that is broadcasted continuously throughout the duration of the exhibition.

Ophélie Demurger (FR)

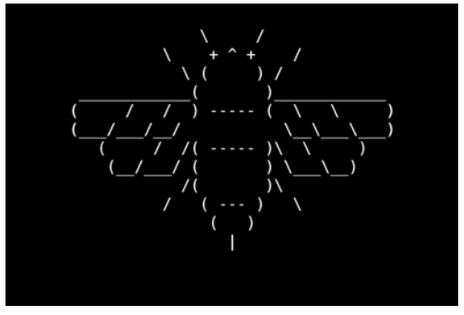
Forever 27 Club

Through videos and performances, I will attempt to find the common essence that I have with the various members of the “27 Club” — singers who died at the apex of their career — in the hope of finding the keys that will lead me to success. I started this work when I was 24 years old; I now only have two years and a few months left until I too reach that age. Here is my life’s punchline: three years to succeed or die.

Valentin Godard (FR)

Science Man

"He welds circuits / and codes all night / Science-man! He makes robots / secretly in his lab, Science-man! He mixes chemicals / without any technical problems, Science-man!"
Part human, part dog, Science-Man is a fictional character who is embodied in various ways: newspaper, comics, performances, figurines, etc. He is halfway between our reality and a sensitive and complex technological future.



Jeremie Nuel (FR)

Nothing wild in particular

Consciousness, memory, reality and identity are regular themes in Philip K. Dick's books. These concepts have fed into AI research since the seventies. This work uses Andrej Karpathy's neural network, known as "recurrent," to train a computer program, using as source a text or a corpus. Once trained, the code writes, character by character, a new text. The corpus that feeds the neuronal network shortens Philip K. Dick's work (52 books). As a mirrored entity, strange and undisciplined, the computer program tries to write, at every iteration, step by step, an often-absurd story, and sometimes, a poetic one.

Bérénice Serra (FR)

Swipe

Swype is a virtual keyboard, developed for touch-screen smartphones and tablets, that allows the user to write by sliding his finger from the first to the last letter of a word. Using a predictive text system, this keyboard can achieve a writing speed of 50 words per minute. The *Swipe* project proposes a translation app that highlights a link between writing speed and the enrichment of language through graphic writing, by recording the signs generated with the Swype keyboard. Each word then produces a new sign.

Development: Bérénice Serra, Gianni Gastaldi and Jacques-Daniel Pillon.

GROWING OUT OF UNNATURAL

MA Visual Arts & Multimedia, San Carles — Fine Arts Faculty, Universitat Politècnica de València (ES)

Program director: Moisés Mañas (ES)

We have the same mental image for the word "World" and the word "Earth." The world is a cultural construct and the Earth is the physical support where this world is located. Culturally, we have focused our interests on situations, violent or beautiful, that we perform on this mute stage/scenery, leading these spectacles without perceiving something very basic: there is no figure without a background. We are in front of the cracked bottom of a scenario that challenges us, breaking its muteness.
Using art (techné), as a creative vehicle between nature, world and society, the projects brought together by this exhibition act as funambulistic machines that walk on the threshold of these states, breaking through spaces full of perpetual instability in the order of thinking and also in the order of doing.
Growing out the Unnatural includes seven projects from AVM Master students that critically question these relations between technological culture and the natural environment, going from a microscopic cellular vision to techno-plants, techno-humans or techno-sounds critical symbiosis states, protected by systems of anonymity in the face of digital surveillance.
The Master's Degree in Visual Arts and Multimedia (AVM) from the Universitat Politècnica de València (Spain) has been the development framework of these projects carried out by students. The Master's teachers assume the responsibility of perceiving changes in the social, technological and natural environment to train students in the critical use of technical and conceptual tools. For two years, students have to assimilate and put into practice the complex connections between very different subjects — anchored in philosophy, science, visual arts, music, electronics, computing, and their own way of understanding the world, society and nature. In this way we hope that these connections will trigger the growth of something that, perhaps without knowing it, was silently already within them.

www.artesvisualesymultimedia.com

Fernando Asensio (ES), José Luis Cuenca (EC), Alejandra Florez (CO), Silvia García (ES), Noelia Medina (ES), Jordi Sos (ES)

Insect a new media

This interactive installation proposes a symbiosis between obsolete technology and natural environment, as an approach to a dystopian future world. A group of sculptural objects composed of plants and technological waste, a multi-screen projection device, a technological codex and a descriptive catalogue make up this undead multimedia project.

Sergio Lecuona Fornes (ES)

NISS: Network Interaction Sound Sniffer

NISS is a sound installation that reacts to the exchange of data carried out through a WiFi network. The soundscape produced by eight reception bells and synthesized sounds makes the hidden digital dialogues between devices perceptible. These interactions, usually triggered by humans but also autonomous, are brought to the human realm encrypted into different sound materials.

Miguel A. Sislian (ES)

CONTRA

CONTRA project presents itself as an interface with a critical character in relation to different systems. The main concepts which are analyzed are power and control of individuals in both physical and digital spaces. In these we try to find the last opaque places in which we can establish a confrontation with power and surveillance, generating a reflection about the topic from the angle of contra-surveillance.

Guillem Sarriá Verdú (ES)

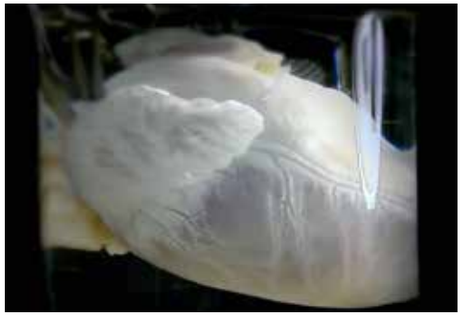
NFT (New Flesh Toys)

NFT consists in the design of prototypes for research into possible haptic interfaces that explore anthropomorphic questions and new forms of ergonomics. The use of these speculative artifacts as instruments generates atmospheres through specific references to sci-fi, cyberpunk mythology and sound experimentation. Emphasis is placed on the problems associated with technological hybridization, body mutation and negative effects of this transformation process.

Carlos del Valle (ES)

H.C.S (Hybrid Cellular Scaffolding)

This ongoing research is an interdisciplinary and speculative process that explores — through the lens of BioArt — the fusion between printed scaffolds and non-organic forms of artificial design and decellularized E.C.M (extracellular matrices). In this hybridization of materials, cells of different cell lines will be cultivated. Apart from this, all the critique towards the techno-scientific world view that BioArt has provided and future paradigms will be illustrated.



Poli Mujica (CL)

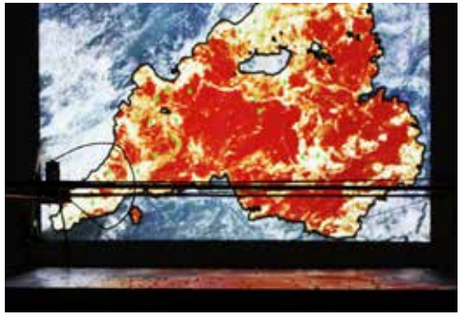
Sonicaedro

Sonicaedro is an installation of an Interactive Interface (HCI) within a dark and closed space. Through the tactile interaction with a dodecahedron of iridescent methacrylate, the user is able to generate a series of visual as well as sound responses in the environment. The videos projected in the room revolve around themes of sacred geometry in nature. To generate an atmosphere of trance and repetition, the sounds will be looped.

Clara Molinicos (ES)

Reset the Forest

Reset the Forest: Interactive Reforestation Device is a project developed from an ecomedia perspective. Its main objective is to promote awareness of forest fires through a device equipped with an interactive graphic interface. The installation shows the aerial view of a burned space, which is displayed on a horizontal screen covered with a transparent fertile substrate. The user selects a point of the image at will and the device then proceeds to sow a real seed in it.



Lat BioLab

UMAI Maimonides University

Curator: Diego Pimentel

Is Humanity near its end? Is our community in an evolutionary process of collective thought? These are some of the questions we ask ourselves at the Lat BioLab. Fargas raises the hypothesis of perpetuating human life in unexplored environments, in the charge of robotic entities that house human embryos. The question is: will AI be able to educate the future humans scattered throughout of the universe? Are we willing to allow intelligent and autonomous entities, independent of human control, the care and preservation of our species? *Robotika, The Nannybot* is a cyber nanny whose duty is to preserve the human species if the end of human civilization arrives in a near or distant future challenging the limits of the human being concept. Fargas imagines that humanity will be soon in a technological position to send capsules containing potential human life to far away destinations within the universe. Based on this fiction, he conceived this project in 2010. Since ancient times, circles represented the synthesis of the community. Bloom states that the first manifestations of collective thought between bacteria arose more than three and a half million years ago, while Harari argues that the essence of the Homo Sapiens is based on his ability to cooperate. The circle as an ancient geometric figure remind us Stonhenge, 3000BC. It is also present in Leonardo's Uomo Vitrubiano and even as a fundamental component of the human iris. Embroiderers use a circle for their warp and weft. The Earth itself can be perceived as a circle when observed from the space. *Ecodermis's* skin is framed by this circle. The images produced by the public are projected over the stretched synthetic skin, composing a collective construction where participants choose to donate a photographic imprint of their skin. Each participant is asked: Do we want to donate our individuality to the collective human of Ecodermis? Or do we prefer to preserve it? From its decisions the skin mutates, transforms and is synthesized into a single skin.

Ecodermis: Alejandra Marinaro, concept and development; Diego Alberti, programmer; Mika Balbuena, photographer; Robotika: Joaquín Fargas, Artist; Lat BioLab; Elia Gasparolo, Design and Development

Alejandra Marinaro (AR)

ECODERMIS

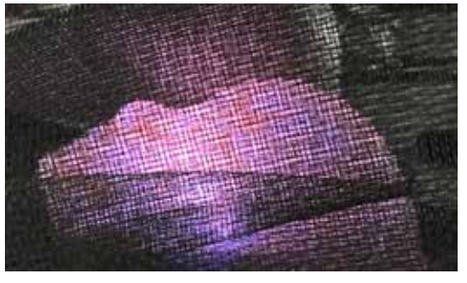
Ecodermis is an artwork that alludes to the skin as an organ connecting the human being with his environment, as it reflects the life, memory and sensations of each individual. At the same time, the skin is also what gives man part of his identity as a species and therefore allows him to coexist and differentiate himself from others. *Ecodermis*, with its own consciousness, gathers and agglutinates the sensations experienced by those who choose to share their skin markings.

Mika Balbuena

Joaquín Fargas (AR)

ROBOTIKA, The Nannybot

Robotika, The Nannybot. Are we, human beings, able to guarantee the preservation of the human species? Are we facing the end of human civilization? Can we trust in AI to perpetuate humanity? Robotika is a cyber nanny whose duty is to preserve the human race. *Robotika* challenges the limits of the human being concept. It is a robot vested with artificial intelligence that shall act as a "galactic ark," looking for a suitable environment for human development.



Elia Gasparolo

PSEUDOREALITY ALTERNATIVES

Cheung Kong School of Art and Design — Digital Media Art Department, Shantou University

Curator: Predrag K. Nikolic

Worldwide human society is moving from the digital to hyper digital age where virtuality is becoming as important as reality. Interpersonal communication is largely happening within a pseudo-real social landscape recently enriched with new artificial intelligence. However, we still find it confusing to navigate our existing social environment and understand each other clearly on different levels such as cultural, emotional, intellectual, and interpersonal. Through the works exhibited by Cheung Kong School of Art and Design, students are trying to communicate ideas of multiple understandings and misunderstandings, subtle and alternative meanings, and how that can affect our social and emotional realities. Regardless of the variety of choices technology has brought us, we are still lacking platforms capable of overriding potential interpersonal and intercultural communication problems. This means that finding alternatives for existing new media communication options will be an interesting challenge for new generations of designers.

Shantou University is a comprehensive university established in 1981 with the approval of the State Council. The school was supported by famous patriots and internationally renowned entrepreneur Mr. Li Ka Shing. Currently, Shantou University is a tertiary institution jointly established by the Ministry of Education, Guangdong Province, and the Li Ka Shing Foundation. Shantou University Cheung Kong School of Art and Design, Digital Media Art Department is strongly committed to providing professional design education that highlights creativity, and promoting individuals' creative thinking with a strong focus on integrating Chinese culture with new world concepts.

Shantou University, Cheung Kong School of Art and Design, Digital Media Art Department
Shantou University, College of Engineering, Magatronics Engineering Department

Xu Dongyan (CN), Guo Biyu (CN), Zhong Manting (CN), Zhengren Chen (CN)

Shadow of Original Sin

Shadow of Original Sin is an interactive installation that explores human original sin. Where there's light, there must be shadows. From the shadows, we can always see the dark side of human nature. The inside of the device will reflect the original sin inside of you as a human being. In the installation, the shadow of the audience will turn into a monster. The monster is completely controlled by the audience, and what the monster will react to depends on the audience. The subconscious evil of human nature is entirely exposed.

Liu Kexu (CN), Ye YiChen (CN), Zheng Jiang (CN), Dong Geng (CN), Wenjie Liang (CN)

Peer

The *Peer* is a work based on exploration, which uses symbolic snooping movements to explore unusual images in the real world. By looking through a tubular structure, the undefined view causes people's desire to snoop. The mechanical structure inside the black box rotates the screen to the corresponding location based on the visitor's position. At the same time, the film images of the six pipelines share the same theme: the multifaceted nature of human beings in society.

Wang Shuyin (CN), Sun Xun (CN), Huang Rong (CN), Hu Ziping (CN), Xiangdong Lu (CN)

Angry Bubble

Anger is often contagious. When a person's anger reaches a certain level, his behavior and speech will always hurt or affect others. But if a person expresses anger in a language or ridiculous behavior that you don't understand at all, you may not be affected by anger, but you may find it interesting. When visitors stand in front of the installation, the angry face spits cheerful bubbles on them, making the angry facial expression hard to interpret and ultimately pointless.

Shadow of Original Sin

Peer

Wang Shuyin (CN), Sun Xun (CN), Huang Rong (CN), Hu Ziping (CN), Xiangdong Lu (CN)

You Don't Know Me

Cultural differences often lead to many misunderstandings. The installation deals with mixed cultural — misunderstanding phenomena and multiple-realities interpretations, opening a new world of contrasts and alternatives. In the boxes are videos with multiple meanings which could be easily (mis)interpreted differently based on different cultural backgrounds. Visitors are challenged to guess the meanings. If they are wrong, the installation responds with — *You Don't Know Me.*

Angry Bubble

You Don't Know Me

Jin Ni (CN), Huang Mingyuan (CN), Zhengren Chen (CN)

Gluttonous Snake

Our emotions can be conveyed through expressions and have the power to influence people around us. How do different emotions affect each other when they are together? Will happiness and sorrow counterbalance? Does anger cause a butterfly effect? Which kind of emotion will make the snake grow stronger rather than kill it? The answer is simple, happiness. We are generating emojis based on facial expressions. Different emojis have different powers. Try to keep growing the snake with happiness.

Gluttonous Snake

HKU Showcase

HKU University of the Arts Utrecht

Curator: Martijn van Gessel

HKU Showcase is a mini showcase of upcoming talents from the HKU University of the Arts Utrecht. The focus for this showcase is on three diverse works in the field of "playful intervention." The HKU Expertise Centre for Creative Technology has curated this mini showcase.
HKU University of the Arts Utrecht distinguishes itself with a broad range of study programs in arts and media to educate the next generation of creative professionals. We have a long track record of successful interdisciplinary projects, international partnerships and meaningful innovation for the creative industries and beyond.
4000 students attend HKU, studying at nine schools: Fine Art, Design, Music and Technology, Games and Interaction, Art and Economics, Media, Utrecht Conservatoire, Theatre and HKU College. HKU has four expertise centers that are responsible for practical research, innovation programs and knowledge development.

The Expertise Centre for Creative Technology explores the possibilities of Virtual and Augmented Reality (VR and AR), sensors, robots, 3D printing, algorithms and interfaces, and their application in art education. We aim to show the many ways in which technology can enrich the arts and how art can help us reflect critically on technological advancements. The center facilitates multidisciplinary experiments to ensure HKU remains ahead of the curve when it comes to cutting-edge facilities and workplaces.

HKU University of the Arts Utrecht
HKU Expertise Centre for Creative Technology
HKU Music and Technology
HKU Theatre
HKU Media
HKU Fine Arts
Pim Boreel
Eva Asscheman

Pim Boreel (NL)

Flora

Flora is a living audiovisual installation that explores the relationship between human beings, technology and nature. This installation is an airtight glass cube, totally cut off from the outside world. Within this cube, an ecosystem is growing based on condensation. Fractal-like spores are taking shape on the glass. When drops of condensation hit sensors inside the installation, light and sound impulses are set in motion. Set within a dark space, this creates an experience for the audience around the living entity that is *Flora*.

Casper de Jong (NL)

Casper's Ex

Casper's Ex is a playful interactive installation on the relationship between human beings and everyday technology. More specifically, this installation is about the relationship between our smartphones and ourselves. We feel attached to our devices, but as soon as a newer and better model crosses our path, we trade them in without remorse. The phone, however, cannot move on. Your data, your scent, and your picture is all they have left. *Casper's Ex* is a lonely smartphone that's been left behind and is trying to connect with you while you are passing by.

Casper's Ex

Multidisciplinary team of HKU students (INT)

City Walk

In *City Walk*, several HKU students work in interdisciplinary teams to create different augmented reality video tours through the city center of Linz. They invite you to watch the city in a completely different way, by zooming in on specific stories and details that often stay unseen. The audience will be directed to the starting point of the city walk by the map on their phone. The video will guide the audience from that point. Walk safe: don't forget to be aware of your surroundings and traffic!

Marcel Dolman

City Walk

Hands-on Media Art Theory

Theory of Interactive Media (BA, MA study program)
Masaryk University, Faculty of Arts, Brno, Czech Republic

MEDIA ART

New media art is a term denoting the critical, subversive, speculative, and creative strategies which have the potential to test the limits of programmed processes, expressions, and experiences mediated by the infrastructure of information and communication technologies. New media artifacts are a result of creative acts which resemble the work of curators rather than the work of creators, DJs rather than interpreters, and dancers rather than sculptors.

MEDIA ART THEORY

Both artists and theoreticians are trapped in the technologically enhanced network of distributed control. They are sentenced to wander in search of escape routes, survival kits, and red/blue pills. Critical distance, which has been regarded as insurance for objectivity and independence of academic theoretical reflection on culture and society, was revealed to be a mere illusion of the over-confident intellectual mind. There is nothing quite like objective truth behind the integrated spectacle of mediated, instant experiences, but there is only the more or less skillfully designed rhetoric of arguments knitted within fuzzy human-machine interactions. In other words, new media art and theory are situated within the same coded and programmed environment. Therefore, media art theory not only reflects on media art practices, but it progressively merges with them, and thus itself becomes speculative, subversive, and experimental.

HANDS-ON MEDIA ART THEORY

The Theory of Interactive Media study program is influenced by the convergence of new media art and theory. Its curriculum includes several subjects which provide students with hands-on experiences of new media as tools of creativity. The goal is to acquaint them with the "logic, vocabulary, and grammar" of the media that artists deal with. The exhibition shows selected outcomes of the media art hands-on lectures. Moreover, two examples of "out of the box" research projects, situated on the borderline between media art theory, practice, and curatorship, will be presented.

Students of Theory of Interactive Media study program
Department of Musicology;
Faculty of Arts, Masaryk University;
TA ČR, Technological Agency of the Czech Republic;
The Brno House of Arts;
Vašulka Kitchen Brno — Center for New Media Art
Moravia IT;
MUCHA

Teacher: Filip Johánek (CZ)

Aura of Audiography

What is an audiography? It is a remedy for visual smog we have to breathe; it is an alternative to an integrated spectacle of instant visual and tactile pleasures that seduce us; it is an imprint of sound which can serve as a trigger of personal memory emergence. The audiography has the same power as the smell of Madeleine cakes in Remembrance of Things Past by Marcel Proust. Close your eyes and listen. What do you see?

Jakub Jurcaga

Kratochvil

Remake the Media History!

Spicak

Behind the Interface

Teacher: Martina Ivičič (SK)

Remake the Media History!

Born online, new media art is like a cultural nomad aimlessly walking through the rhizomatic meanders of an archive without walls. It flickers back and forth in the annals of history and crosses geographic, cultural, and institutional boundaries, both physically and virtually. The aim of the subject The Best of New Media Art is to acquaint students with media art history in a similar way. They are encouraged to enter into a creative and critical dialogue with canonical works of avant-garde and media art in order to link current new media art and culture practices with their roots.

Teachers: Monika Szűcsová (SK), Adam Franc (CZ)

Behind the Interface

Software art refers to the artistic activity that allows software (and the software's cultural significance) to be reflected within the media or material of software. The course Software Art is divided into theoretical lectures on the history and genealogy of software art on one hand, and practical application on the other. The presented works are the result of linking theoretical and practical skills that students have acquired. They demonstrate a variety of approaches to creating and reflecting on software artworks.

Picture — Author: Jan Špičák, technique: text generator, software: Python programming language (open source)

Teacher: Tomáš Staudek (CZ)

Math is the New Latin

Algorithms in art are no longer mere visualization tools, but rather creative partners with a considerable share of aesthetic responsibility. The universal language of algorithms is math. Students of the subject put hands-on principles of mathematics in art, get acquainted with more than 50 creative software tools (visual grammars, fractals, chaos, tessellations, etc.) and learn how to understand and critically reflect on calculated creativity.

Stelclova

artgorithms.droppages.com; picture — Natália Lajčiaková, technique: Multidimensional complex fractal, Software: Mandelbulb3d, Photoshop

Jana Horáková (CZ), Jiří Mucha (CZ)

Computer Graphic Re-visited

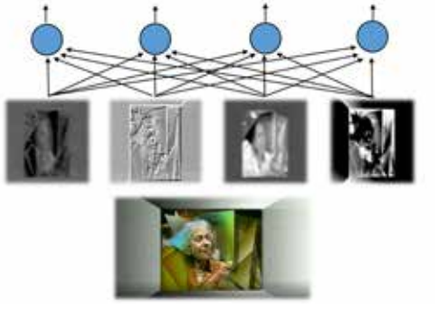
screenshot

This is a high-tech reconstruction of the Computer Graphic exhibition organized at the Brno House of Arts in 1968 by the artist, curator and theorist Jiří Valoch. It was one of the first gallery presentations of computer art worldwide and the very first exhibition of this art in the so-called Eastern Bloc. The exhibition project called Computer Graphic Re-visited draws on archival research. However, it is not a reconstruction of the original event, but rather a remake balancing between a digital art-history experiment and the "remembering exhibition" (R. Greenberg).

Jana Horáková (CZ), Jiří Schimmel (CZ) et al.

Deep Learning from Vasulkas' Video Archive

The goal of the project is to experimentally test the utility of artificial neural networks in service of media art historiography and theory. Artificial neural networks conduct iconographic and audiographic analyses of the Woody and Steina Vasulka video archive. We suppose that the application of deep learning technologies in the study of the archive content could serve not only for data mining purposes but, more importantly, can become a creative means for rethinking the poetics of early electronic art.



Bajzík Sikora

Application partners of the project are The Vašulka Kitchen Brno — Center for New Media Art and The Brno House of Arts. The project (TL02000270 Media Art Live Archive) is conducted with financial support from TA ČR. Technological Agency of the Czech Republic.

Technoetic Pharmakon

Shanghai Institute of Visual Arts, Roy Ascott Technoetic Arts Studio, DETAO Masters Academy

Curators: John Bardakos, Bill Zhou, Jessie Dong

At the heart of every cybernetic structure lies a black box, which many see as the main protagonist in every narrative around feedback loops, outputs, and communication between living organisms and machines. Therefore, for the theme *Out of the Box*, we choose to emphasize decentralized exploration of the "field" of interactions that surround this central black box core. This field acts as an environment inhabited by processes and sub-processes that manifest as information flows, behavioral acts, and all manner of dialectic correlations. Influenced by Alfred North Whitehead's processual philosophy in relation to core concepts from Roy Ascott's Technoetic arts paradigm, we form an art network that contains complex unfolding interactions of mental, digital, organic and non-organic "atoms" that generate the technoetic arts experience.
Under the term "pharmakon," our exhibition suggests that the essence of what exists "outside" the cybernetic black box can be considered a remedy for the midlife crisis of the digital revolution. By deploying technoetic processes — a combination of physical, digital and moist media elements — these processes and sub-processes of remediation offer opportunities to recuperate and renew.
Within this context of healing, we are very proud to present the art installation *Technoetic Pharmakon* as a field of dialectic entities: a series of Technoetic creations from the students of the Roy Ascott Technoetic Arts Studio, DeTao Masters Academy, Shanghai Institute of Visual Arts (SIVA). The Technoetic Arts Major is an advanced art program based on the research-creation paradigm. We expose students to the important emerging theories and practices across the fields of art, science, and technology, using artistic practice as the research medium. Technoetics is a convergent field of theory and practice that seeks to explore the broad spectrum of consciousness and connectivity; a specific approach that uses digital, telematic, chemical or spiritual means, and embraces both the interactive and psychoactive.

Professor Roy Ascott (Detao Master of Technoetic Arts)
Dr Michelle Lewis King (Roy Ascott Technoetic Arts, Assistant Professor, Artst)
Eleanor Zhang (P.A. Professor Roy Ascott, Studio Assistant Roy Ascott Technoetic Arts Studio)

Frank Cong (CN)

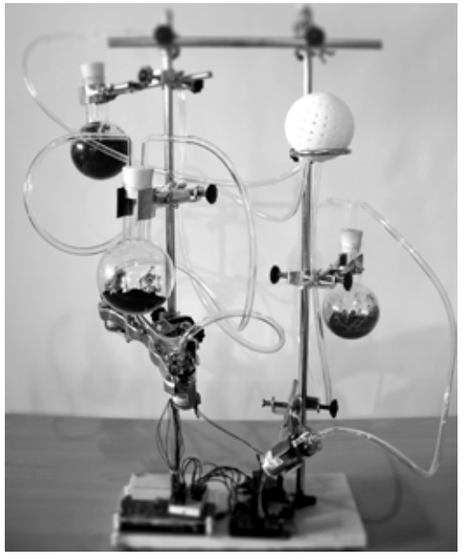
e-gamete Digital Procreation Service (2019)

What happens to human reproduction when human genetic information is digitized? What might be the ethical, legal, and social implications (ELSI) for using such biotechnology? *e-gamete Digital Procreation Service (2019)* is a speculative design project that invites audiences to a future scenario of network-transmitted genetic information and computer-simulated human procreation.

Bill (BiCheng) Zhou (CN)

Noise Eater

Noise Eater is a kinetic art piece exploring the poetics of noise electronics and the human condition. The installation allows the participants as well as the art piece itself to consume noise, generate noise and provide an aesthetic experiment consisting of electronics, exploring concepts of humanity and nature.



Noise Eater

Bill (BiCheng) Zhou (CN)

S>A<S

This artwork investigates the interactivity between living organisms and electronic sound / vision systems in the form of a social drama between three ant colonies. How could some simple units work together to show the complexity of ant behavior? How could electronic systems be integrated into living ant colonies? How could humans sense this complexity?

S>A<S

Bill (BiCheng) Zhou (CN)

Slime mold reality

This art piece combines virtual and biological spaces. The *Physarum polycephalum* (slime mold) is a superorganism that consists of a large number of single cells, and just like the ocean in Stanislaw Lem's novel *Solaris*, it has intelligence, it senses the environment, it remembers external stimulus and it can change the reality of those who interact with it.

Slime mold reality

Always Already Alien

SAIC School of the Art Institute of Chicago

Curator: Duncan Bass

The world has changed since 1969. In the fifty years since the inception of Art and Technology Studies, networked technologies have become ubiquitous — mediating nearly every aspect of our daily lives. *Always Already Alien* explores the societal impact of these systems by analyzing the way we relate to one another in physical and virtual spaces. Are we closer to our loved ones around the globe than the strangers we push past in the metro? Can we avoid this seemingly inevitable sense of alienation? The selected works attempt to blur the boundaries between real and virtual, speculating new forms of cohabitation that insist on the physical presence of the bodies navigating these spaces. *Always Already Alien* showcases work by recent graduates of the Art and Technology Studies department at the School of the Art Institute of Chicago (SAIC), including Yuemin Huang, Amay Kataria, Rafael Rivas, Doug Rosman, and Leah Solomon.

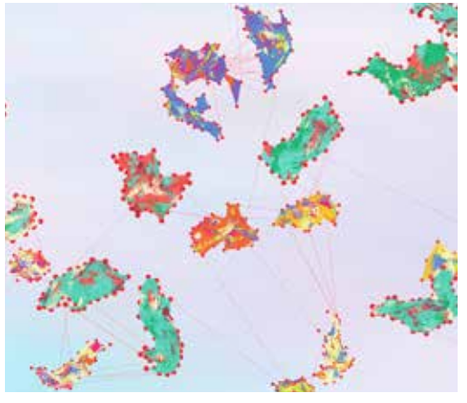
The first of its type in the United States, SAIC'S Art and Technology Studies department was established in 1969 with the introduction of a single course operating at the intersection of art, science, and technology.
Since its inception, the program has continually pioneered the use of emerging technologies in contemporary art, developing new models of artistic practice and integrating these models into the curriculum of one of the world's most influential art and design schools.

Martin Berger, Provost
Arnold Kemp, Graduate Dean
Gretchen Talbot, Dean of Administration, Budget and Planning
MaryAnn Schaefer, Executive Director of Enrollment Marketing & Operations
Nicole Hall, Director of Graduate Admissions
Provost Council

Amay Kataria (IN)

LAN: Live Agent Nest

LAN (Live Agent Nest) is a colony of synthetic agents constantly in a state of action. The protocols driving them manifest in behaviors like attraction, repulsion, and forming connections. Their contact with other agents leads to emergent behaviors depending on the agent's capabilities. After forming connections with other bodies, a network of dialog starts transpiring in these super agents. This flow can be disrupted by the intervention of humans, detected using a camera in the space.



Doug Rosman (US)

self-contained III

A neural network trained to see the world as variations of the artist's body enacts a process of algorithmic interpretation that contends with a body as a subject of multiplicity. The neural network, with its photographic understanding of the artist, creates a pseudo-autonomous figure unconstrained by physics, biology and time, that is simultaneously one and many. The movements and costumes of this algorithmic entity attempt to answer the question: how does one represent themselves in a data set?

Yuemin Huang (CN)

Space

Inspired by the Shanghai Metro, audience movement inside this crowded space triggers a range of sonic responses. A series of large white balloons fill the installation, forcing the viewer to squeeze between them. Acting as unpredictable controllers, these abstract bodies respond to human visitors and to one another, creating a cacophony that increases as we try to escape it. We can leave because it is an artwork, we can't escape when it is life.

Leah Solomon (US)

EndIIEnd VR: Illumined and Illuminated

*EndIIEnd VR: Illumined and Illuminated*re-imagines the poems of Carol Ciavonne, weaving the vantage points of an Azimuth, Quadrant, and Meridian to explore themes of exile, rebirth, and black sonic resistance.

Rafa Rivas (US)

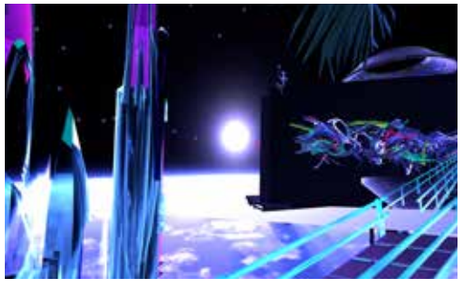
EXULANSIS [the VR experience]

Enter the world of dreams through a portal in a future city from a different dimension. Welcome to *EXULANSIS*, an immersive and interactive experience.

self-contained III

Space

EndIIEnd VR: Illumined and Illuminated



EXULANSIS [the VR experience]

Philosophy of Drawing

Aichi University of the Arts (AUA)

Curator: Atsuhito Sekiguchi

Aichi University of Art (AUA) is exhibiting the Media Art Study Group of JASIAS (Japan) Society of Image Arts and Sciences, in particular, works with media visuals and traditional expressions from media artists active in the Chubu region of Japan.The theme of AUA's exhibition is *Philosophy of Drawing*, showcasing artists and researchers from the area around the university. This exhibition focuses on the physical act of "drawing" and shows works that juxtapose "inner sight" and "drawing," perceiving the physical act. This project exhibits 7 groups of works by 10 artists. Works that show the difference between individual drawings and the concept of sets, such as DTG *DM 1.0*. Works that approach the landscape in memory by AR, T.YAMAMTO *Resolution of landscape*. Works that have cognitive effects on their physicality by their own vision, K.KODAKA *Bodiject-oriented*. The image of returning to water accesses people's own memories, N.OSAKI *Portraits*. Project that draws a new "constellation" on the ground using satellite and handmade radio wave reflector, H.SUZUKI+N.OHKI *Constellations of the Earth*. Analog drawing machine with wooden scale arm, A.SEKIGUCHI and I.KATAYAMA *Arm Existance2019*. Using the small display makes viewer to experience like "look through the micro world", H.ISHIKAWA *RGB microscope*.

Agency for Cultural Affaires, Government of Japan

DTG (JP)

DM 1.0

Image analysis by deep learning has improved AI drastically, but the AI does not yet understand the meaning of "cat." *DM 1.0* is an interactive drawing machine, and the intention is to experiment with an abstract concept (this time a circle) that people have. Humans draw through rotational movement of their joints, and the drawing process of *DM 1.0* is a combination of two linear motions. This work will make us aware of the difference between human physicality and machine drawing.

AUA

Tsutomu Yamamoto (JP)

Resolution of landscape

Resolution of Landscape is a work of mixed reality. Viewers can experience two spaces between the exhibition space and a landscape movie shown on the iPad. Through this experience, the viewer draws a space in their own mind. That experience expresses spatial sense and contemporary realism in virtual space.

AUA

AUA

Kenri Kodaka (JP)

Bodiject-oriented

Bodiject-oriented is a media installation designed to give viewers an experience of "bodiject" (body as object). In this work, a single double-sided mirror vertically divides a flat display into two left and right planes; the body-image plane and the object-image plane. Some deformed fingers are shown from the body-image plane and some vegetable sticks are shown from the object-image plane, where they are continuously operated by someone's hands in a loosely synchronized manner. This kind of parallel observation enables viewers to detach ownership from their physical body.

Nobuyuki Osaki (JP)

Portraits

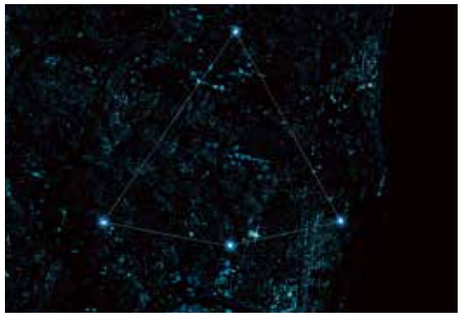
Meditating about myself and others. About memory and perception. About the reality of all of us, living in the information society. And also meditating about politics, society and unpredictable disasters, about our future. The more I think about it, the more "this world" is flooded with vagueness and uncertainties. That isn't meant to be negative at all. The vague and uncertain state presents a possibility floating to the unknown. I use myself like a coordinate axis, I meditate about this feeling of "vagueness" and "uncertainty" and ask myself about the existence and possibility of this world.

AUA

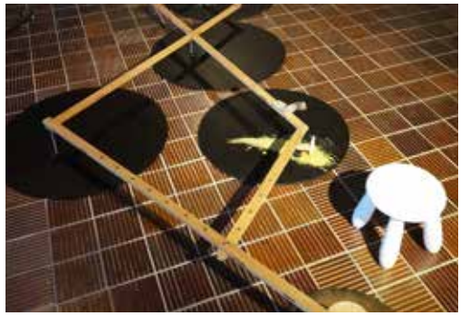
Hiroshi Suzuki (JP), Masato Ohki (JP)

Constellations of the Earth

Constellations of the Earth is a project that draws a new “constellation” on the ground using a satellite and a handmade radio wave reflector. The earth observation satellite *Daichi 2* transmits radio waves and observes the ground’s surface by registering the reflected radio waves. By arranging a radio wave reflector on the ground, we efficiently reflect the radio wave of *Daichi 2* on the ground and draw a “constellation” there.



AUA



AUA

Atsuhito Sekiguchi (JP), Isato Kataoka (JP)

Arm Existence2019

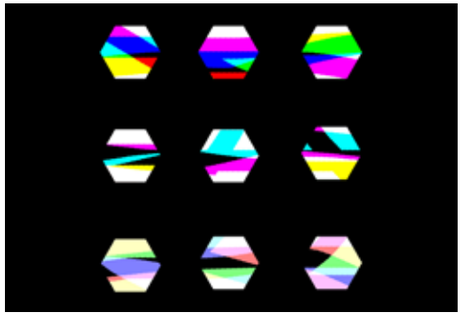
We usually write and draw pictures without doubting the length of our arms. If someone suddenly grabs your arms and they become immobile, it also feels like putting an arm in the mud. If you cannot confirm the information by eye, you will only feel the outside world from your own body reaction.

Canon Inc.

Hina Ishikawa (JP)

RGB microscope

This drawing system uses the characteristics of the three primary colors of light.
I focused on the differences between the action of drawing and the things which were drawn. Using the small display gives the viewer an experience like “looking through the micro world.”



AUA

Neigungsgruppe Medienfassade

Academy of Media Arts Cologne, Media and Fine Art, Academic Group: exMedia

Curator: Dawid Liftinger

By approaching the facade of the Ars Electronica Center as an oversized (yet direct) stage towards the public sphere, the students of the Academy of Media Arts Cologne propose an analysis, exploration, and even revision of the façade’s role, meaning and functions. Through manifold site-specific interventions including interactive, political, expanded/animated, performative and art historical aspects, the façade serves as vector and container for individual artistic discourses to coexist.

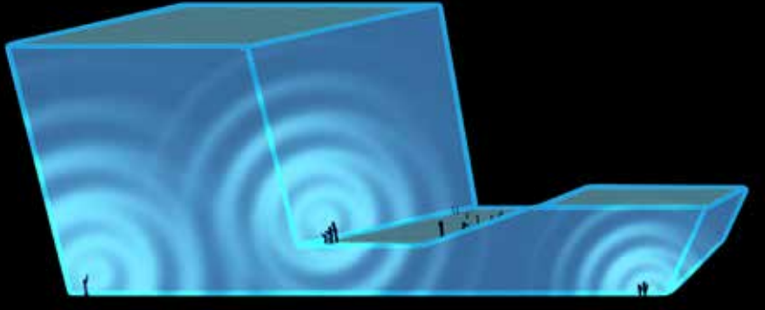
exMedia is an academic group which shares the conviction that experimental aesthetic projects and socio-technical research lead to an expansion of scholarly and creative horizons that effectively address existential human conditions in the 21st century. exMedia integrates design, coding, sound and animation, and connects critical reflection with experimental approaches based on fundamental questions raised by individuals and society. exMedia works on the conditions of a technology-driven culture and addresses its future, including post-media perspectives.

YUE (CN)

Overloading / Overloaded: Touch Me Softly

Interactive installation

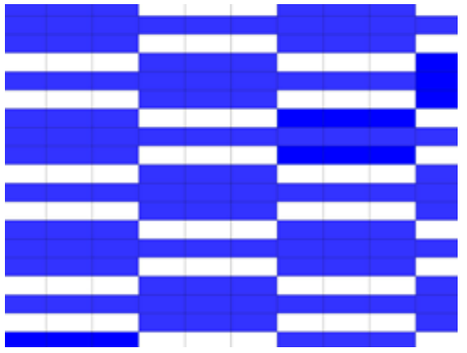
The Ars Electronica Center itself is being expanded to include touch-sensitive sensors which will be transformed into an interactive installation. Several sensor-points placed on different positions on the façade invite visitors to touch, caress, scratch, strike and hit the building. Touch, in turn, creates wave animations that spread across the building. Overloading the sensors (eg. hard knocking) causes the whole façade to crash.



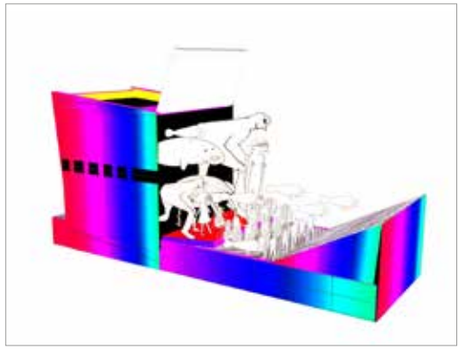
Moritz Laumert (DE)

Nord Süd

Animation



Nord Süd deals with two important non-representational painters: Josef Albers and Günther Fruhtrunk. Both have great art-historical relevance and are points of reference to consumer culture and design alike. Fruhtrunk designed the plastic bag for Aldi-Nord, which irrevocably connects him to the brand. Albers' famous painting, "Homage to the Square," has surprising parallels to the Aldi-Süd or Hofer logo. Both of the painting-inspired graphics are processed and animated on the façade.



Kudo Mayuko (JP)

Tape

Augmented Reality (AR)-Animation

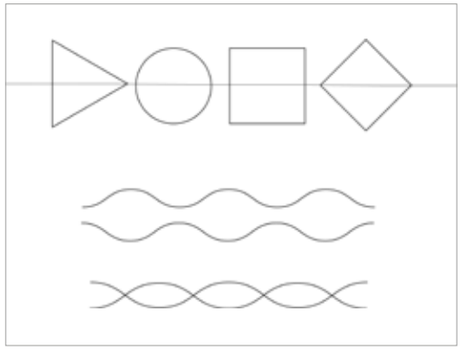
"Every time you imagine something, it's the key to reality. Imagination is the key to creation. In other words, everything you imagine is [...] reality." — Omnec Onec, from the planet Venus. In *Tape*, the AEC is transformed into an oversized, sparkling ribbon-wrapped box. If you point an AR-app on it, the ribbon disengages and opens a gate that reveals the content: fleeing color dots, which slowly form figures that rise from an intangible, all-energy world into our reality.

Lee Sooyeun (KR)

Symmetry

Animation

An animation that considers the reflections of the media façade in the Danube. Simple shapes, sinus waves, mandala patterns that double in the water.



Dawid Liftinger (AT)

Hyperscreen [Testpattern]

Animation

A search for the limit of the technical boundaries of the media façade at the threshold of human perception; redeeming their promise as fast, colorful pictures. Every "pixel" always changes every frame. Flicker, no pause, high-contrast: everything is always on. This is noise for the eyes.

Camilo Sandoval (CO)

DEFACING

Data visualization

Historically and politically, Colombia is at crossroads. After fifty years of internal war and conflict, it's time to redefine/rethink our identity as a nation, the way we see ourselves and our international perception. I use AEC's façade to visualize data showing a broad panorama of what was and is still going on in Colombia. The data come from several institutions and observers of the conflict and are meant to reflect the magnitude of the events through abstraction.

Bela Usabaev (DE)

Body Public Space Visual Image

Multimedia interactive performance

From the public space around the AEC, impulses are transmitted through the body to the façade as part of an interactive performance. The completely free structure of public space meets the defined counterpart of the body in order to be mounted on the façade as if on a canvas. It is an exploration of the time and structure of the immediate environment using one's own body. The performance has a calm and investigative character; that of an object, organically moved, in public space.

TIMELESSNESS

Universidade de Lisboa, Faculdade de Belas-Artes

Curators: Mónica Mendes, Ana Teresa Vicente

When Ars Electronica completes 40 years, we might be inclined to think that digital art is bound, by technology, to the time of its creation. Experiencing this selection in which drawings are excavated and expanded through augmented reality, however, a viewer's gaze is allowed to degrade the photographic image, and the tangible or performative gestures of the audience are used to evoke memories or point to new directions. We realize that creativity can definitely transcend the technology used to build it. Calling upon temporality, space, and memory as key ingredients, *Timelessness* engages the participants on a journey through social, aesthetic, and temporal landscapes. The exhibition gathers artistic projects developed by undergraduate, masters, and doctoral degree students in the scope of the Multimedia Art Department of the Faculdade de Belas-Artes of the Universidade de Lisboa — FBAUL. Since its foundation as a School of Arts in 1836, FBAUL has always sought to integrate multiple artistic and design areas. One of its most recent departments, Multimedia Art, incorporates its traditional expertise in painting, sculpture, communication and product design with new technologies and media for results that are timeless. The Multimedia Art department is connected to the Centro de Investigação e de Estudos em Belas-Artes — CIEBA, and to the Interactive Technologies Institute — ITI/LARSYS. Since 2004, Multimedia Art at FBAUL strives to deepen artistic research by bringing a multidisciplinary approach to an institution that is simultaneously contemporary and historical, while fostering collaboration within other departments in the institution and establishing partnerships such as that with Instituto Superior Técnico and with NOVA laboratory for Computer Science and Informatics. FBAUL is located in Chiado, a cosmopolitan, bohemian and artistic neighborhood in downtown Lisbon, Portugal.

Multimedia Art Head of Department: Patrícia Gouveia; Faculty: António de Sousa Dias, Mónica Mendes, Pedro Ângelo; Featured Artists: Adriana Moreno, Ana Teresa Vicente, Andreia Batista / André Fidalgo Silva / Luís Morais / Miguel Ribeiro, Joana Resende, João Batista / Noel Martins / Pedro Gonçalves / Hugo Rocha, Pedro Soares, Régis Costa; Collaborators: Maurício Martins, Tiago Rorke, Rita Carvalho (Technical support and Documentation, Makers in Little Lisbon — MILL) João Costa and João Rocha (Exhibition Product Design, ProjectLabb — FBAUL); INSTITUTIONS — Invited institution and research centres: Universidade de Lisboa, Faculdade de Belas-Artes — FBAUL, *http://www.belasartes.ulisboa.pt;* Universidade de Lisboa, Faculdade de Belas-Artes, Centro de Investigação e de Estudos em Belas-Artes — CIEBA, *http://cieba.belasartes.ulisboa.pt*; Partnerships: Interactive Technologies Institute — ITI / LARSYS *https://iti.larsys.pt*, Instituto Superior Técnico — IST, *https://tecnico.ulisboa.pt;* Support: ARTiVIS — Art and Technology for Sustainability, *http://artivis.net,* MILL — Makers in Little Lisbonhttp://mill.pt

Ana Teresa Vicente (PT)

Wandering Gaze

The *Wandering Gaze* project explores the relationship between the observer's gaze and an image through eye-tracking technology. The installation allows the viewers' gaze to be materialized into a tangible path that will erode the surface of a photograph. The image is thus a performative space, as the viewers' gaze is invited to wander about and explore it, contributing to the piece even while causing its deterioration.

Maria Martins

Developed with the technical assistance of MILL (Tiago Rorke, Maurício Martins and Pedro Ângelo).

Pedro Soares (PT)

ARchaeologies

In *Archaeologies*, we're faced with a sheet of paper in which an iconic picture from the past was engraved through folding. Observers may use the available materials to produce their own drawings while simultaneously revealing the hidden image. By observing the piece with an Augmented Reality app, we can see the strata that contain each individual citation made by the participants and how every new intervention is conditioned by the ones before it.

Adriana Moreno (BR)

SandBox — Grains in Memory

Sandbox is an interactive art installation that proposes continuous reflections on the human relationship between the sea and its identity paths. The installation consists of a corpus of sound memories based on the experiences of people who narrate their relationships of belonging with the sea. Memories — both "soundscapes", a concept adapted from Schafer referring to sounds in the marine environment, and oral narratives recorded during fieldwork — are then revealed by moving wet sand in an instrumented box.

Joana Resende (PT)

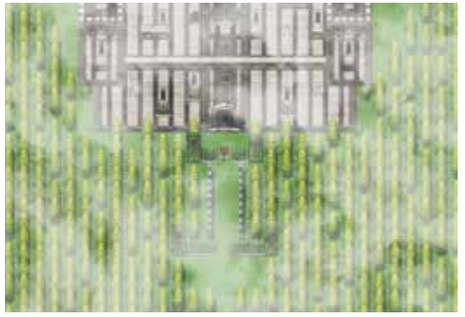
Frontiers || Territories

Boundaries are constantly being changed, and those we find today may have already changed tomorrow. In a protected area of the Greater Lisbon area, aerial images are collected to build a map with open source software. These are shared through a website that is, itself, also a map, allowing for the visualization of economic, ecological and social while trying to see how well a territory / protected area is respected — "para mais tarde recordar" (for later recall).

Andreia Batista (PT), André Fidalgo Silva (PT), Luís Morais (PT), Miguel Ribeiro (PT)

The Fortress

The Fortress is a story-driven video game for computers where choices and interactions explored within the game result in different outcomes. Its main mechanics correlate with social interactions: by switching between two characters with different personalities, the player needs to unravel the mystery of each puzzle/level of the fortress.
The project was created under the aegis of the Multimedia Art Department and the Instituto Superior Técnico Master's Degree in Games.



Andreia Batista

João Batista (PT), Noel Martins (PT), Pedro Gonçalves (PT), Hugo Rocha (PT)

Orbita

Joao Batista

Orbita is an open-world, virtual reality game developed to represent a futuristic point of view in which science and spirituality coexist. It uses puzzles to stimulate the player into exploring its environments. Confronting players with a futuristic possibility that does not rank science above spirituality (or vice versa), this game gives them a chance to understand the metaphors that underpin the main character's journey.

Régis Costa de Oliveira (BR)

Inter Faces

The *Inter Faces* performance uses augmented reality to replace the performer's body — including self-portraits — with digital images framed on a screen. The performers will act in a space that fuses the real with the digital. Their actions will likewise occur by crossing in between these two worlds, exploring simulacra and making it evident it from digital contents that seemingly appeal to us, even as it also makes clear how such temptations can exert a narcoticizing, hallucinogenic effect on us.

The Ornaments of the Post-Anthropocene

The Academy of Arts, Architecture and Design in Prague

Curators: Prof. ak. arch. Imrich Vaško, MgA. Shota Tsikoliya, Ph.D, M.Sc. and MgA. David Kovařík

Smooth surfaces and glazed facades represented the challenges of modernist architecture. Architecture without ornaments or, as defined by Beatriz Colomina, "X-ray" architecture now faces the challenges of the post-Anthropocene. These are buildings not inhabited by people but by machines; built to produce, share, reorganize or store. It's architecture without daylight, facades without windows, and floors without stairs. How do architects respond to the emerging challenges of the new era and their environment? The exhibition will present previously rejected ornaments as integrated parts of several projects designed for or by the machines.
The Academy of Arts, Architecture and Design in Prague (UMPRUM) was founded in 1885. Throughout its existence it has ranked among the best educational institutions in the country. It boasts a number of successful graduates who have gone on to become respected professionals, garnering acclaim beyond the Czech Republic. The academy is divided into the departments of architecture, design, fine arts, applied arts, graphic design and theory and history of art. Each department is divided into studios according to their area of specialization. Studio heads are leading figures in the Czech art scene.
The Academy is also reacting to market needs and new student interests. During the 2018/2019 semester, it opened two new studios: the Guest Artist Programme (Spring, 2018), where UMPRUM invites an acknowledged foreign artist to work with its students, and Photography II (Winter, 2018, under the Graphic Design Department), to provide a new generation of talent to innovate within the visual world.
At the moment, the Academy offers about 600 students with 25 studios in 6 departments. Twice a year, it opens to the public for a presentation of student works entitled "Artsemestr." Each year the academy organizes over 15 exhibitions, half of which are shown abroad.
In 2018, UMPRUM entered the prestigious QS World University Rankings and it is currently listed among the world's 51st and 100th top universities, together with schools such as the École nationale supérieure des arts decoratifs (ENSAD) in Paris, Cornell University and the Cranbrook Academy of Art in the US, and Sheffield Hallam University and Kingston University in the UK.

Studio Architecture III is an experimental and research-oriented platform and a part of the Academy of Arts, Architecture and Design in Prague. Students: Adam Angelov (CZ), Frida Block (SE), Malin Hilding, Petra Garajová (SK), Ivan Olontsev (KZ), Marketa Osifová (CZ), Shervin Peyghambari (IR), Tomáš Růžička (CZ), Tamara Salajová (CZ), Petra Sochůrková (CZ), Dan Sviták (CZ), Záviš Unzeitig (CZ), Adam Varga (SK)

Studio Architecture III

Platforms of Differential Growth

Design based on the algorithmic evolution of geometries represents machine production without need for human intervention.

Such systems are capable of self-reproduction and self-reparation. The exhibited concrete elements are cut-outs of an endless structure.

Studio Architecture III

Material Moods

This ongoing investigation explores the natural behavior of materials and their possibilities of self-organization. The synthesis of robotic production and material performance lies at the center of a research project aiming to develop new and fluid-based construction composites.

Shota Tsikoliya

Material Moods

Studio Architecture III

Buildings Without People

Buildings without people are already an integral part of our cities, though often not architecturally integrated to them yet. These projects replace five iconic 20th-century buildings with 21st century typologies such as data centers or logistics hubs inside of which humans are unwelcome or, at best, inconvenient guests.

Shota Tsikoliya

Buildings Without People

Shota Tsikoliya

Platforms of Differential Growth

Zen · Machine

CAFA, Central Academy of Fine Arts Beijing

Curators: Qiu Zhijie, Jo Wei

AlphaGo was able to beat humans at chess because playing chess is the perfect activity for a robot. If we could connect AlphaGo's "brain" to a computer, we would quickly see that it possesses a level of concentration much greater than that of humans, that it never grows tired, and that, unlike us, it is not a slave to its emotions. For thousands of years, Eastern monks have used various forms of meditation to tap into hidden wisdom. Now, however, using technology such as AI and big data, we have created a type of wisdom that vastly surpasses our own.

The purpose of Zen Buddhism is not just limited to harnessing wisdom through concentration and meditation. The Zen Buddhist notion of "huatou" (dialectical meditation) is a highly original method of teaching: by asking themselves a question that, on the surface, seems illogical, monks are forced to confront a series of existential doubts. By reflecting on these doubts, they are able to gain new forms of enlightenment. Huatou is not mere occultism — it teaches us that everyone can develop their own interpretation of a certain issue.

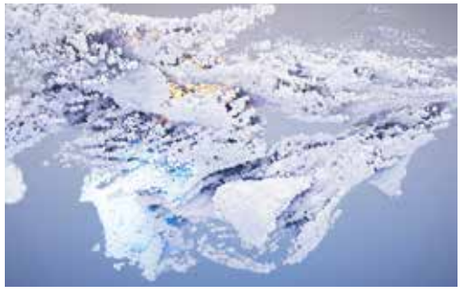
The Central Academy of Fine Arts (CAFA) EAST Season is a platform devoted to international dialogues across multiple disciplines — namely education, art, science, and technology (EAST). This year's exhibition revolves around neuroscience and artificial intelligence. Based on the theme of all things Zen, works in this exhibition reflect on how human thought may change under the influence of external equipment such as brain-computer interfaces, as well as the possibility that computers will develop the same capacity for thought as humans.

Qi Chen (CN)

Brainwave Project to Help Patients with Disorders of Consciousness

This project is a functional artwork aiming at "art healing." In this project, I hope to provide an approach to help people who are in a minimally conscious state (MCS) and have partial preservation of conscious awareness by using wearable devices to detect real-time brain waves and generate images to help doctors and families understand the different brain responses to different audiovisual inputs.

Technical support: Ma Xiaxiao, Zhang Chi

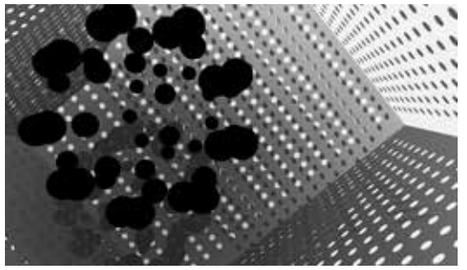


Qi Chen

He Xuan (CN)

Mind Particles

The particles (little balls) are suspended and aggregated in the air, and the brain waves generated by concentration during meditation control the substances in the container. When the control stops, the air movement stops, the particles return to the absolute steady state and are scattered.



He Xuan

Jianhao Lei (CN)

Time

Making time orderly is a temptation that nobody can resist. What I present in this project is a trapped clock. The audience takes an EEG and the data extracted from their brain activities reinvigorate the clock. Then, the clock is no longer moving second by second, but at a real-time pace according to the brain activity of the viewer.

Liu Guiyu (CN)

Body Poetry

Body Poetry is an exploration of future body data and poetic human data. When linking the body to the data, perhaps our sadness, fear and enthusiasm are not only the spirituality of poetry, but the result of the algorithm. Here, intelligent wearables are used to creatively express the “poetry of the body.” Our body functions can be calculated in the future. Can each emotion be derived from the algorithm?

Jianhao Lei

Time

Liu Guiyu

Body Poetry

Liu Zhicheng (CN)

Wind Charm

What were the earliest musical Instruments of mankind? How did humanity start enjoying music? Human beings have become more sensitive to emotions through technology, and now they have become too meticulous. This work attempts to transform emotions into simple signals produced by blowing air on bottlenecks, which is directly controlled by brain waves. Like the hand of a pioneer musician, the users explore the boundary between sound and emotion with their brain waves.

Liu Zhicheng

Qiu Siyao (CN)

Gaze into Haze

Qiu Siyao

Will the rise of single gazes also mean a decline of the global view? Every single gaze means letting go of the larger picture. The person being gazed at may feel embarrassed. Is it possible for the inorganic object being gazed at to change? Who can remember what happened in the moment before a distraction?

Qiu Zhijie (CN), He Xiaodong (CN)

Mappa Mundi: An Interactive Artistic Mind Map Generator with Artificial Imagination

A multi-level mind map and corresponding graphics are generated via an LSTM model to form an artistic image based on live stimuli, injected with AI imagination. This work recognizes semantics via ASR and POS tagging, and further processes and generates associations among them.

Qiu Zhijie, He Xiaodong

Iris Long (CN), Deng Hanbin (CN), Wu Tiancheng (CN)

RASA-BOX

Rasa is a “mirror” — it evaluates your “emotional state” in real-time based on your gestures. The project explores the limits of the comfort zone of the “privacy of one’s own feelings.” A camera and the algorithms will detect in real-time the skeleton data of the viewers and deduce their emotional state in order to write a sentence that falls in the same emotion category.

Iris Long

Baoyang Chen (CN)

ARTificial Banality, The Faking of Looking, and Alchemical Gaming

Baoyang Chen

Two humanoids surrounded by four screens showing swapped faces and machine’s vision. This project explores the ontological dichotomies among us, technology and society by again questioning if machine can think. A brain in the vat craves to be awakened. A tulip — of us, mass media, and technology — withers by our illusion of body awakening. This paragraph was generated by AI after showing the image of the work to AI.

Ao Yanxi (CN)

Tracing

Tracing is a robot that “eavesdrops” on humans via audio speech recognition, language processing, and part-of-speech tagging. Finally, the conversations are printed out. The robots are free to move around in the exhibition space, spitting out an intriguing piece of text from time to time. The imprints left by humans invite us to discuss the relationship between people and machines.

Content One Campus — Network Intelligence

Organized by Ministry of Culture, Sports and Tourism of the Republic of Korea (MCST) and Korea Creative Content Agency (KOCCA)

With its disruptive AI, robot, data, 3D, and VR technologies, the Fourth Industrial Revolution has triggered a fundamental change in the way we live, work and relate to one another. The speed and breadth of the economic, political, social, and cultural changes produced by technology are literally beyond our comprehension. It is time to think, act, and collaborate to bring about new methodologies for the coming age. What, then, will be the best strategic approach? What manners of collaboration are necessary? How can we educate our talented creators?
These urgent questions point to the integration of the arts and humanities with science and technology.
The increasing importance of institutional support is to construct an ecosystem for easier and smarter interdisciplinary collaboration between art and science, design and technology. The Content One Campus, launched in 2018 by the Ministry of Culture, Sports and Tourism of the Republic of Korea(MCST) and the Korea Creative Content Agency (KOCCA), is designed to make sense of the Fourth Industrial Revolution’s technological context; eliciting collaborative projects in four theatres of operation *school, lab, institution, industry* to cultivate creators at the intersection of different disciplines. This unique initiative has successfully merged seemingly incompatible academic, corporate, and institutional approaches into one integrated process to navigate the future together.
In 2018, the Content One Campus supported four such collaborations, which provided students with the opportunity to earn college credit for their participation and cultivated over 1000 creators. Based on last year’s success, 2019 will witness a significant expansion in its geographical scope, number of projects (15) and participants in interdisciplinary convergence (3,750).

Sejong University (Sejong University Industry Academy Cooperation Foundation), ComixV Co.

VR Webtoon Creation and Business Model Collaboration Project as Next Generation Content IP

Sejong University and ComixV Co. are preparing for the next generation of the dynamically evolving webtoon paradigm by proposing the next curriculum for intelligent VR webtoons. The “VR Webtoon Creation and Business Model Collaboration Project as Next Generation Content IP” project was aimed at completing a VR webtoon that incorporated intelligent technology. For its development, the project relied on theory, practice, and storytelling; with in-depth, one-on-one student to mentor work done through consulting with participating and webtoon-related agencies.

Participants:
Sejong University: Han Chang Wan (Manager of Sejong University Convergence Content Industry Research Iab, Professor of Sejong University Cartoon animation tech), Ryu Yu-hee (Researcher), Park Sung-hee (Researcher), Huh Tae-ho (Researcher), Chihairan (Researcher)
ComixV Co.: Yang Byung Suk (CEO), Seok Ji won (ComixV PD), Jang Se-yeon (ComixV PD)

Konkuk University (Konkuk University-Industry Cooperation Foundation), Ubion Co.Ltd.

Development of Convergent Educational Content and Badge Service based on Blockchain

In an era where online content innovation is much anticipated, Konkuk University and Ubion have collaborated to develop a badge service aimed at revitalizing educational contents and platforms on the basis of blockchain technology. The project built a blockchain-based digital badge service on the Learning Management System through the application of open badge 2.0 standard. It will support the integration of educational data in a decentralized manner and activate a blockchain-based Moodle learning management system by developing online educational contents.

Participants:
Konkuk University: Keol Lim (Principal Investigator), Minho Joo (Co-investigator), Jieun Lee (Main Researcher), Yujin Kim (Main Researcher), Minyoung Kim (Main Researcher), Yunho Jang (Main Researcher), Junseo Park (Main Researcher), Jinju Choi (Main Researcher)

Korea National University of Arts (Industry-Academic Cooperation Foundation), BIRDHAND Co. Ltd.

Convergence Art Education through Production of Performance Motion Capture-used VR/MR Contents

The project is a performance motion-capture through virtual/extended reality, which is a genre of extended-reality art through participative storytelling. It aims to demonstrate and to present performance and narrative types of VR contents that use wearable motion capture, as well as to produce two types of small, studio-prototype works for film, drama, and dance contents. The goal is to become a new genre of media art that will expand the curriculum into interdisciplinary fields beyond engineering-related subjects.

Participants:
Korea National University of Arts: Choong-hyun Joh (VR Planning & Visualizing), Seoung-mu Lee (VR Direction & Storytelling), Jeong-min Lee (VR Animation), Jae-hong Jang (Stereo), Won-woo Lee (VR Sound Technical Directing), Hye-in Jeong (VR Planning & Storytelling), Yeon-ji Kim (VR Planning & Storytelling), Jae-woo Lee (VR Planning & Storytelling), Jong-hoon Eun (VR Acting & Performance Directing), Ji-in Park (Storytelling & Film Directing), Hyung-yoon Jang (Storytelling & Film Directing), Hye-jin Jeong (Storytelling & Film Directing), Ji-hyun Jeong (Storytelling & Film Directing), Yeong-yoon Song (Project Planning), Myung-seok Chae (VR Acting & Performance Directing), Dong-geun Shin (VR Acting & Performance Directing), Seong-tae Kim (VR Acting & Performance Directing), Jin-hyung Kim (VR Filming & Record Image Filming), Hyung-joon Gwon (VR Acting & Performance Directing), Tae-wan Jeong (VR Filming & Record Image Filming), Soo-jin Kim (Sound Effect & Music Composition), Ji-won Son (Music Planning & Composition), Sang-hyun Yoo (VR Planning & Production, Wonderspaces), Seong-hoon Bahn (VR Planning & Production, Hanyang University)
BIRDHAND Co. Ltd.: Hee-hwan Oh (Planning & Production, Team Leader), Sang-hoon Heo (Game Engine, Team Leader), Han-bit Lee (Graphic Directing, Team Leader), Jubilee (Game Engine, Senior Researcher)

ChungKang College of Cultural Industries (Industry-Academic Cooperation Foundation), Creek & River Entertainment Co. Ltd.

Converged Content Development Training through Content IP Expansion

This project between the Chungkang College of Cultural Industries and Creek & River Entertainment seeks to produce interdisciplinary performance content. Creek & River Entertainment holds the IP for the original musical, Gaksital, and will play a vital role in the development of its commercialized performance, while Chunkang College will be in charge of directing, acting, and sound production. The comics, game content and animation schools will produce 2D and 3D videos for the musical stage, and the fashion school design the stage costumes.

Participants: ChungKang College of Cultural Industries: Choi Seoung Shin (Principal Investigator), Park In Ha (Main Researcher), Kim Ji Yeon (Main Researcher), Kim Sang Dong (Main Researcher), Yum Dong Hyun (Main Researcher), Kim Myung Hee (Main Researcher)
Creek & River Entertainment Co. Ltd.: Yun Yeon Sik (CEO)

Chung-Ang University, Ajou University Industry-Academic Cooperation Foundation

Visual Perception Model of Digital, Human-Based (on Visible Korean Brain) Big Data

Chung-Ang University, the College of Art and Technology, has conducted educational programs and convergence projects. Engineering technical support is provided by the Software College at Chung-Ang University, while related medical contents, such as visual human information and anatomical practice, are provided by Medical College in Ajou University. The goal is to automatically generate digital, human eye movements without the use of keying or captured eye-tracking data. The project plans to create an immersive content that can storytell from the point of eye contact and interact with the audience.

Participants: Chung-Ang University: Donghwan Har (Principal Investigator), Taekyoung Yoo (Main Researcher, Professor), Minsuk Chung (Main Researcher), Dohee Cho (Main Researcher), Bumsun Chung (Main Researcher)

Daejeon Information & Culture Industry Promotion Agency, Mokwon University

Smart Webtoon Production; Smart Web Fairytale Appbook Production; 3D Character (AR/VR Game) Production; 3D Character (Drone Video) Production

The *Smart Webtoon Production*, *Smart Web Fairy-Tale Appbook Production, 3D Character (AR/VR Game) Production*, and *3D Character (Drone video) Production* are a series of educational projects that combine comics and webtoons with major technologies of the Fourth Industrial Revolution, such as smart, VR, AR, and 3D animation. The project works to create a webtoon that combines smart content and web animated works to create a fusion, 3D character for use with VR/AR games and drones.

Participants: Mokwon University: Sung In Hong (Principal Investigator), Byung Soo Kim (Main Researcher)

Kyungnam University (Industry-Academic Cooperation Foundation of Kyungnam University), Gyeongnam Culture and Arts Foundation

Convergence Sensibility Content Education Project, *Another Level: Five Senses*

Kyungnam University's Cultural Content Department and the Gyeongnam Culture and Arts Foundation, both of which are leading players in the culture & arts of the region.
Their collaboration, The Convergence Sensibility Content Education Project "Another Level: Five Senses", aims to foster creative talent in the culture-technology field of Gyeongsangnam-do. A regionally-led project, it hopes to show a unique cultural convergence between the distinctive historical stories of Gaya, a webtoon-based content and media art technology.

Participants: Kyungnam University: Yoo Young-Jae (Principal Investigator, Professor), Hwang Kook-Tae (Business Planning, Professor), Kim Sun-Hyung & Prof. An Chairin (Storytelling, Professor), Han Jeong-Seok (Media Art, Professor), Kim Jong-Won (Stage Performance, Professor), Kim Han-Shin (Historical Story Building (Professor), Jang Yoon-Jung (History of Gaya, Professor), Lee Jong-Kook (Digital Video Production, Professor), Ha Chun-Geun (Business Planning, General Manager), Park Hee-Young (Business Planning)

Jeju Film & Culture Industry Promotion Agency, Cheju Halla University (Cheju Halla University Academy-Industry Co-op)

Interactive Convergence Project *Along With the Gods: Fly Oreum*

The goal of this collaborative project is to implement the mythical island of Jeju with local cultural contents. Through drone footage, the audience can experience a virtual, bird's-eye-view experience of Jeju Island, just like the mythical creature. The project is divided into four regular courses including video animation, design studio, 3D stereoscopic image editing and capstone design; as well as eleven, non-regular courses including VR aerial photographing, underwater camera photography, a special lecture, field experience, and a mythology seminar.

Participants:
Jeju Film & Culture Industry Promotion Agency: Hyun Kyung Chul, Hwang Tae Yun, Kim Myeong Ju, Kang Seong Jun, Koh Kyung Wook
Cheju Halla University: Kim Sang Hoon, Kim Dong Man, Byun Young Jun, Kim Hyunwoo

Gwangju University (Institute of Educational-Industrial Cooperation), Asia Culture Institute

VR Immersive Media for Asian Food & Culture Contents

Gwangju University and the Asia Culture Institute have established a collaborative project to create contents that combine educational programming with Asian Cultural Heritage Archives. Benefiting from their respective roles as academic and professional institutions, they will design a joint curriculum for students to produce contents using VR immersive media technology. This project aims to provide education grounded on art and technology, and to conduct the convergence project for Asian food culture.

Participants: Gwangju University: Daeyeon Cho (Professor), Kyouseok Baik (Regular course/ Professor), Eunwon Yang (Project Manager/ Researcher), Sarah Kim (Project Manager/ Researcher), Seungmin Lee (Assistant Researcher);
Asia Culture Institute: Jaeyeon Ahn (Head of Research and Planning Team/ Researcher), Hyoyoon Shim (Irregular course/ Researcher); Consultants: Jaewoong Park, JIinhong Park, Hyunhee Han

Chungnam Culture Technology Industry Agency, Sangmyung University (Sangmyung University Industry-Academy Cooperation Foundation), AVA Entertainment Co. Ltd.

360 Live Animation, Media Art VR Movie Convergence Contact Training Project *Maeheon, Yoon Bong-gil*

The Chungnam Culture Technology Industry Agency operates various infrastructure facilities in support of creative talent, and Sangmyung University has a well-equipped and integrated education system based on fusion content. AVA Entertainment is South Korea's top fusion content provider, and has produced more than 300 VR videos, media art and real-life content. Their collaborative project is centered on Yoon Bong-gil, a national hero who fought bravely against Japanese imperialism. It unfolds before and after three days of his patriotic deed in Hong-Gu Park on April 29, 1932, and considers his death.

Participants: Chungnam Culture Technology Industry: Kim Dong Kyu (Head of the Chungnam Culture Technology Industry Agency), Kim Jeakon (Director of Business Operation), Yun Hong Jun (Business Operations)
Sangmyung University: Lee Hae Kwang (Participatory Responsibility/ Associate Professor), Shim Hyungkeun (Business Planning/ Associate Professor), Kwon Byung Chul (Professor of Business Planning and Implementation), Lee Jong Yoon (Assistant Professor of Business Planning and Implementation), Choi Hyun ju (Assistant Professor of Business Planning and Implementation), Yu Keun hye (Project Execution and Performance Management/Professor)
AVA Entertainment Co. Ltd.: Nam Hae Kee (Participatory Responsibility/Ava Entertainment Director), Lim Ji-hwan (Camera Production/Ava Entertainment Team Leader)

Sungkyul University (Sungkyul University Industry-Academy Cooperation Foundation), Anyang Creative Industry Promotion Agency

Education for the Development of Hyper-realistic Media Contents Based on XR (Extended Reality)

Sungkyul University seeks to educate hyper-realistic media content development based on XR. Anyang City Creation Industry Promotion Agency cooperates with this comparative course through the establishment of a corporate network and the support of young entrepreneurs. The collaborative project aims to develop content that allows multiple people to simultaneously watch performances in a virtual space through network VR technology, using ambisonics.

Participants: Hyunsik Yoo (Main Researcher)

Dongguk University Gyeongju (Dongguk University Gyeongju Foundation of University-Industry Cooperation), College of Humanities, College of Management & Economics, The Center of Research for Silla Culture, Culture Art Design Institute

Development of Character & Tourism Products Using Historical and Cultural Content in the Gyeongsangbuk-do Province Area

This project involves developing prototypes for characters and tourism products based on local historic and cultural knowledge with participating students, and encouraging them to start a business based on convergence education. It is developed through the integration of art & design, the development of each field through an expert company, and business administration studies.

Participants:
Dongguk University Gyeongju: Kim Gyu Tae (Principal Investigator), Ryu Wan Ha (Main Researchers), Kim Young Chul (Main Researchers), Joo Jae Hun (Main Researchers), Park Kwang Youn (Main Researchers)

Kaywon University (Kaywon University of Art & Design Industrial-Academic Cooperation Group), GIANTSTEP Inc.

Realtime Interacting Virtual Character System Setup

The department of animation at Kaywon University of Art and Design offers a traditional education in 2D, 3D augmented and virtual reality animation. The purpose of this collaborative project is to plan and produce virtual characters for real-time interactions that are suitable for MCN contents and performance art. Given the quick growth of the MCN industry, and through the use of high-efficiency production methodologies, a real-time motion capture function and automatic lip-sync function, among other features; it should make communication with virtual Youtubers in real-time possible.

Kaywon University of Art & Design: Chae Yun Kyoung (Professor), Dong Keuramee (Assistant Professor), Choi Young Rak (Assistant Professor), Shin Won Ho (Head of the Main Office)

Soonchunhyang University (Soonchunhyang Industry-Academy Cooperation Foundation), DIGIFORÊT

Development of Virtual/Mixed Reality Education Contents with *Romeo & Juliet*

This collaborative project demonstrates the first phase of Romeo and Juliet content as a complex reality by using realistic topography in conjunction with 3D scanning based on graphical implementation in the virtual environment. Players will interact with the characters and objects in a virtual / augmented reality environment through an HMD or holographic lens in ways that allow them to engage in dialogue and advance the story. This project develops educational contents through the convergence of English literature, cultural contents, VR / MR design, and the Internet of Things (IoT).

Soon Chun Hyang University: Lee young soo (Principal Investigator), Lee Hyon-u (Main Researchers), Misun Yun (Main Researchers), Kim Jung Ki (Main Researchers), Dong Min Kim (Main Researchers), Jung Yeop Lee (Main Researchers); DIGIFORÊT: Park Sung Hoon

“The Messy Shape of Problems” Past, Present and Future Perspectives of Design

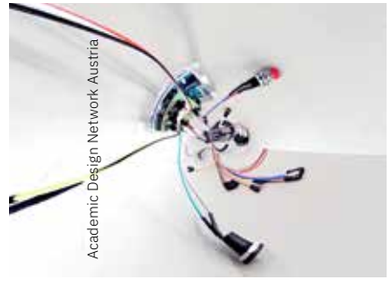
Academic Design Network Austria

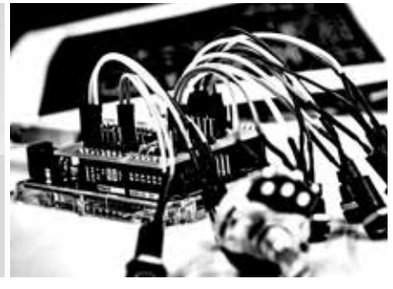
Exhibition, Impulse lectures, Fishbowl Discussions and Workshops

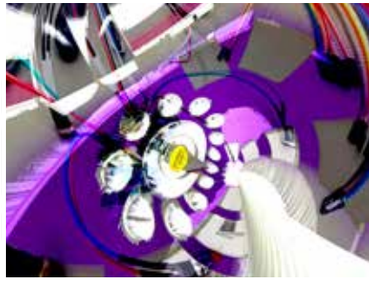
Designers are facing an increasingly complex field of global challenges, which necessitate great sensitivity to relevant questions, adequate approaches, and tools for developing sustainable solutions. How can design education convey the required skills and perspectives to cope with this dramatic rise in complexity? And how do technological advances shape the future of design? Focusing on these questions, the Campus exhibition of the Academic Design Network Austria aims to epitomize the wide range of approaches characterizing the design education landscape in Austria. The student projects presented form the point of departure for a three-day discursive format consisting of impulse lectures, fishbowl discussions, and workshops such as a speculative design lab. This participatory format brings together interested visitors with representatives of design universities to discuss present and future developments in the field of design with reference to ongoing technological transformation. Diverse approaches, perspectives and the potential of design to address major challenges of contemporary and future societies will be discussed. The continually expanding Academic Design Network Austria currently comprises the following partner institutions in Austria:

Die Angewandte Wien; FH Joanneum, Graz; FH Salzburg (Puch-Urstein); FH Salzburg (Kuchl); FH St. Pölten; FH Vorarlberg; Kunstuniversität Linz, New Design University, St. Pölten; Universität Mozarteum, Salzburg, Alpen Adria Universität Klagenfurt; FH Oberösterreich

Die Angewandte. University of Applied Arts Vienna. Oliver Kartak — *www.dieangewandte.at*; FH Joanneum. University of Applied Sciences Graz. Karl Stocker, Daniel Fabry, Orhan Kipcak, Erika Thümmel, Sigrid Bürstmayr — *www.fh-joanneum.at;* FH Salzburg Campus Urstein & Kuchl. Thomas Hitthaler, Thomas Grundnigg, Günther Grall, Wolfgang Irlinger, Matthias Tratz, Lisa Winkler — *www.fh-salzburg.ac.at*; FH St. Pölten. St. Pölten University of Applied Sciences. Markus Wintersberger, Christian Munk, Rosa von Suess — *www.fhstp.ac.at*; FH Vorarlberg. University of Applied Sciences Dornbirn. Markus Hanzer, Margarita Köhl, Roland Alton-Scheidl, Karin Bleiweiss — *www.fhv.at*; Kunst Universität Linz. Universität für künstlerische und industrielle Gestaltung Linz. Tina Frank, Mario Zeppelzauer, Marianne Pührerfellner — *www.ufg.at;* New Design University. Privatuniversität St. Pölten. Stefan Moritsch, Christine Schwaiger — *www.ndu.ac.at*; Mozarteum University Salzburg. Gertrud Fischbacher, Laura Ackermann, Marius Schebella — *www.moz.ac.at;* Alpen-Adria-Universität Klagenfurt — *www.aau.at;* FH Oberösterreich. University of Applied Sciences Upper Austria — *www.fh-ooe.at;* Danube University Krems. Florian Halm — *www.donau-uni.ac.at*; Supported by designaustria. Martin Fössleitner — *www.designaustria.at*







Dominik Einfalt, Noah von Stietencron,
Class of Graphic Design, Prof. Oliver Kartak, University of Applied Arts Vienna

1 DEEP FEELING — An Interactive Utopia

Individuals who have experienced little or no love in their development will for the most part act in an unloving and calculating manner in their later lives. They are lacking in their ability to experience emotions and in their emotional and social competence. Without an understanding of what affection feels like, their social actions are based on sober, calculating schemes and are executed without empathy, conscience or social responsibility. These are characteristics of a dissocial and sociopathic personality.
Deep Feeling lets artificial intelligence experience human affection to enable the growth of a social, feeling and loving AI. This prototype of a computer input device is equipped with sensors that transmit human touch to the AI.

FH JOANNEUM Institute of Design & Communication

2 Spatial Turn — Interactive Portfolio

The installation *Spatial Turn* shows numerous projects created by students in the fields of communication design, exhibition design, interaction design, media design and sound design from recent graduates of the Institute of Design & Communication of the University of Applied Sciences Graz as an interactive media portfolio experience. At the institute, designers are trained with the ability to think critically and consider economic, social, cultural and technological backgrounds in order to design effectively for society. Design expertise and skills, user-centered methods and field research are all important components of the degree programs.
Students of master's degree programs Exhibition Design and Communication, Media, Sound and Interaction Design.

Salt Castle Studio, Fachhochschule Salzburg

3 Chapeau

Chapeau is a fast-paced multiplayer platformer where you and your friends each play a quirky hat, challenging each other for objectives while engaging in mid-air combat. You will have to try your best to stay ahead while fluidly jumping, gliding and dashing through beautifully crafted levels, inspired by Austria's historic city centers.

Keep your momentum going to move faster, beat your competition, and avoid falling to the ground by using the environment and roaming people to your advantage!

Developer: Salt Castle Studio — *www.saltcastlestudio.com*; Fachhochschule Salzburg; FHStartup Center

New Design University Privatuniversität GesmbH, BA Design, Handwerk & materielle Kultur, MA Innenarchitektur & Visuelle Kommunikation

4 Pets

The Bachelor Degree Program Design, Handwerk & materielle Kultur deals with the question of how design and production are changing in the postindustrial era. Georg Siegele's diploma thesis *Pets* (2019) is a good example of the projects by students in this program. Based on artistic and scientific research, they investigate how our material world is changing and what role design plays in it.

The New Design University St. Pölten is an international destination for quality education in the fields of design, technology and business, the New Design University trains creative thinkers who advance social change and explore tomorrow's work and design practice today.

https://www.ndu.ac.at

Fachhochschule Vorarlberg/ Vorarlberg University of Applied Sciences
InterMedia MA — Masters's Degree Program Design

5 Experiencing a future design process; What are you going to do tomorrow?

Experiencing a future design process addresses the possible effects of artificial intelligence on the communication design profession. Which tasks can be solved with the help of algorithms? For which requirements will human services be indispensable in the future? With the help of an interactive game, design processes can be played through and the possible role of technological support can be experienced. *What are you going to do tomorrow*: Current economic transformation will affect the self-esteem of millions of people psychologically. Still we define our efficiency as a virtue more accurate than "efficiency" in the sense of ambitious work ethics. But we are approaching times where there may not be any jobs in the classical conception anymore. Therefore this project focuses on the question of what types of transformation on a societal as well as an individual basis in needed to cope with these changes.

St. Pölten University of Applied Sciences, Bachelor Degree Program Media Technology and Master Program Digital Design, Masterclass Experimental Media

6 fhSPACE YouTube Palace

Selected Students of the Bachelor Degree Program, Media Technology and Master Program Digital Design / Masterclass Experimental Media at the St. Pölten University of Applied Sciences present a selection of current media projects in the form of experimental video works. The works, which deal with the topic "echo chamber," provide an up-to-date insight into the experimental media production of the students. Some of them are independent AV productions, others are experimental translations of interactive installations. The synopsis forms a varied arc of suspense.

It is more a matter of searching for the experiment than of offering ready-made solutions.

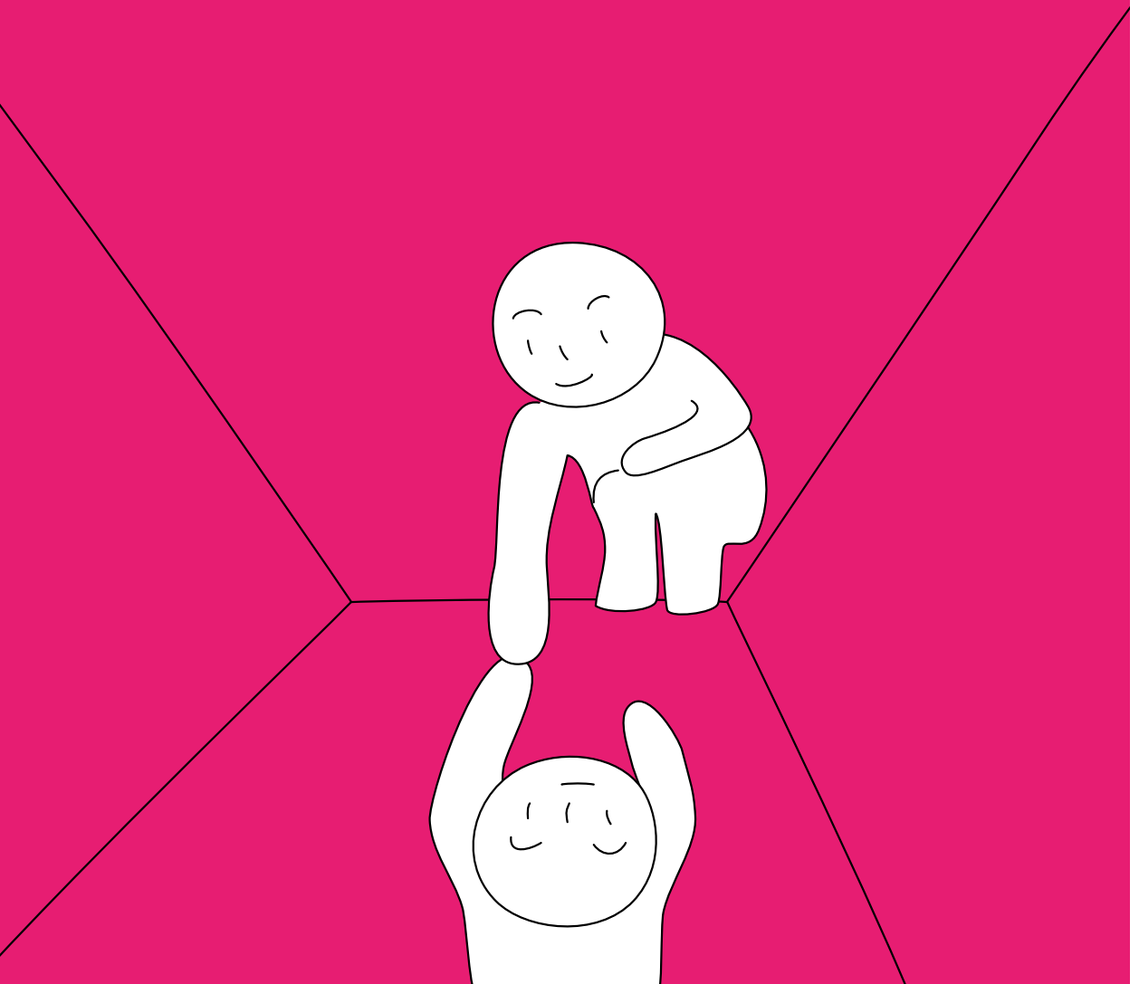
WISH, UGUDAG — Antonio Labuhar, Laurenz Öllinger; *ILLUSION* — Carina Baumgartner, Jakob Felsner, David Kierberger, Erich Linha, Laurenz Öllinger, Nikolaus Wiener; *126* — Antonio Labuhar, Laurenz Öllinger; *OCEAN OF COLORS* — Ines Blatterer, Sophie Yang; *AMISSA* — Ines Blatterer, Philipp Gierlinger, Christian Milutinovic, Sophie Yang; *ECHOES OF THE PAST* — Viktoria Regen; *ESCAPE* — Anna Chocholowicz; *AUTOPHOBIA* — Omar Awad, Christian Milutinovic; *KALAIDOTEETH* — Armin Havrest, Laura Jelinek, Nicola Toth, Maximilian Schwetz; *WHO ARE YOU* — Hanna Schimek; Eva Fischer, Christian Munk, Thomas Wagensommerer und Markus Wintersberger

Christoph Picco, Sophia Eder
Kunst Universität Linz. Universität für künstlerische und industrielle Gestaltung Linz

7 Utopie/Dystopie
A_Wearable

As Henry David Thoreau said: "The price of anything is the amount of life you exchange for it." And we exchange an alarming amount of our time for digital content. Mindfulness, Mental Resilience and Digital Detox are emerging trends. But even if we want to, very few of us are able to escape the tricks and well-developed strategies content creators use to keep us in their system. Our most valuable good is being stolen while we are slaves caged in a bubble. Realizing that we cannot free ourselves on our own, *A_Wearable* was developed to help us resist the lure of all swipeable surfaces.

ARS ELECTRONICA ANIMATION



Serial Parallels, Max Hattler (DK/UK/DE/HK)

Ars Electronica ANIMATION FESTIVAL 2019

As every year, Ars Electronica Animation Festival is a condensed best-of of current productions in digital filmmaking, selected from the entries of this year's Prix Ars Electronica, the international competition for cyber arts in the computer animation category. Trends of the last few years are continuing with further growth in AI-related themes, VR productions, installative works, large scale mappings, and interactive elements. This year there have been 835 entries in total. In two pre-jury rounds, first by Christine Schöpf, Juergen Hagler, and Nana Thurner, then in an online rating by the jurors Alex Verhaest, Ina Conradi, Birgitta Hosea, Ferdi Alici, and Nobuaki Doi, the count has been reduced to the more manageable number of 165 productions, considering the three days of deliberation. These also form the foundation for the programs of this year's Ars Electronica Animation Festival. Additionally, there are guest screenings by Anifilm Třeboň, Digital Media – Hagenberg Campus, Animationsinstitut of the Film Academy Baden-Württemberg, ISCA (International Students Creative Award) and Japan Media Arts Festival. Young filmmakers under age 10 will be presented in the Young Animations category. A studio feature from Platige Image shows animated short movies from the last 20 years. All in all, the program provides an interesting insight into current international productions of digital filmmaking.

Studio Feature: Platige Image

Platige Image is an award-winning film production, VFX, animation and post-production company based in Warsaw, Poland. They work for the biggest brands in the world, the best video game publishers and some of the finest film directors. They started out as a studio composed of a dozen or so people producing mainly commercials and music videos. Gradually, they developed their team and expanded their portfolio with short films, cinematics, 3D live theatre sets, VFX for live action movies and special projects, such as museum installations.

MIAZMAT, Klaudiusz Wesołowski (PL)

Manic VR, Kalina Bertin (CA), Fred Casia (CA), Sandra Rodriguez (CA), Nicolas S. Roy (CA)

Electronic Theatre

In 1987, which was also the year of the first Prix Ars Electronica, the Electronic Theatre was established as an open-air show. The program shows the 15 best works selected by the jury and is at the same time a showcase for current productions from an artistic, substantial, cultural, and cutting-edge technological perspective.

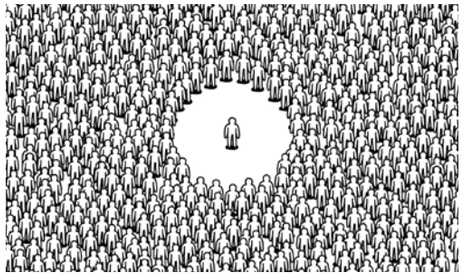
Music & Visuals

A dance performance by a group of snails on the wing of an airplane, an indecisive woman sitting in front of her letter of resignation, a car ride through a dreamy desert landscape, aesthetically staged growth processes of organic forms, or dancing mochis. This program contains music videos and various experimental forms of picture-sound synthesis in different animation techniques.

Powder — New Tribe, AC-bu (JP)

Data Narration

This program seeks to raise some sociological and ecological questions. Visualizations of air pollution, maritime data, artistic research into diabetes, and an analysis of group dynamics are among the topics. It also asks what happens when humans and AI mutate into a single consciousness.



KIDS, Michael Frei (CH), Mario von Rickenbach (CH)/Playables

One Small Step, Andrew Chesworth, Bobby Pontillas, Shaofu Zhang (US, CN)

Narration

Narration in the classical sense acquires a new dimension in the digital realm and shows laconically in images, what wouldn't be possible with words. A little girl dreaming of becoming an astronaut, randomly found film footage casting new light on a deceased father, what will happen when a group of people suddenly lose their self-control — just a few examples of this program.

Expanded Animation

This compilation assembles works that explore new forms of animated visual worlds far from the usual norm and shows, among other things, an interactive shadow installation, animated MR rooms, an installation combining animated images with a dance performance, a multi-media façade for the Elbphilharmonie Hamburg and experimental VR projects.

Dökk, fuse (IT)

Experimental

This program presents new innovative trajectories within current cinematography at the intersection of art and science and brings together works with contemporary positions, from computer-generated procedural structures to trailblazing examples of frame-by-frame animated sequences.

Boy transcoded from phosphine, Rodrigo Faustini (BR)

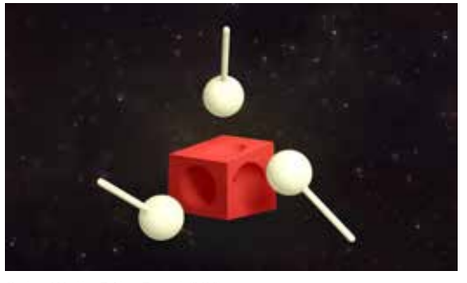
The Ostrich Politic, Mohamad Houhou (FR)

Statement

A group of soldiers set off on a peaceful exploration of the city through a war zone in the middle of Manhattan, a game of pretended emergencies, a society that buries its head in the sand. Filmmakers take a stand on various political issues such as censorship in Saudi Arabia or ask questions about staged images in the refugee crisis.

World Machines

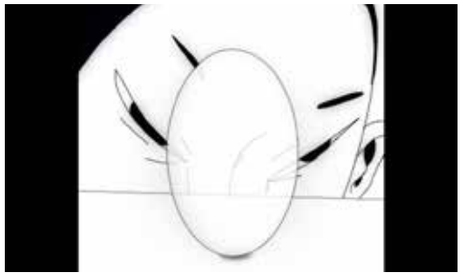
Urbanization and globalization in the digital age is one example. Another one is a movie portraying various traditional patterns of the Ainu people, the native inhabitants of Northern Japan.
Seoul City Machine is a city symphony of an urban space of tomorrow, written and narrated by an AI chatbot. Or maybe a city portrait of young people and their personal data.



Solar Walk, Réka Bucsi (HU)

Gender

This program portrays fairly diverse gender positions: A man and a woman meet each other — an unpleasant yet at the same time provocative situation between attraction and rejection. An experimental animation about gender and sexuality with vagina and penis as its main elements. An analysis of anorexia and a black comedy about a couple with differing attitudes towards gender norms.



Egg, Martina Scarpelli (IT)

ACID RAIN, Tomek Popakul (PL)

Mental States

Mental confusion, fears and dead-end states form the undercurrent of this program. A young woman breaks free of her everyday life and embarks on an uncertain journey.
A story about outsiders in a pub, a group therapy session with animals, and a boy trapped in societal constructions.

LateNite

The late night program: irreverent, satirical and little indecent. In *Late Nite*, the films walk the thin line between dead seriousness and biting satire; they are full of philosophical approaches on one side, and trashy humor on the other. Mourning and loss are processed in colorful and brutal cartoon aesthetic, memes and Internet humor thematized in the pixel format, and some of the films will remain a mystery even after thorough reflection.

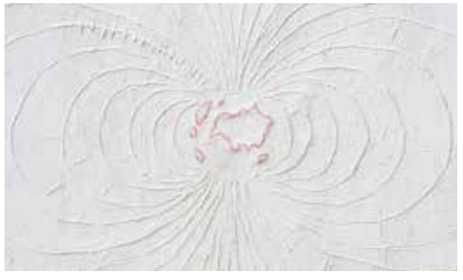
still lost I guess, here's a tunnel..., Darío Alva (SP), sound by Diego Navarro (SP)

Young Animations

u19 — CREATE YOUR WORLD (AT), bugnplay.ch (CH), mb21 (DE) und C3<19 (HU)

Gifted young filmmakers annually submit their weird, subtle, witty, utopian, critical and dystopian works for consideration to the Prix Ars Electronica's u19 — CREATE YOUR WORLD category (AT), bugnplay.ch (CH), mb21 (DE) and C3<19 (HU). The greatest hits are featured in Young Animations.
Curated by Sirikit Amann (KulturKontakt Austria)

Nightmare before my birthday, Celina Niederhuber (AT)



Advertising the Earth Radio — Stephen P. McGreevy's VLF Cut-outs, Zbyšek Semelka (CZ)

Anifilm Presents: Czech Animation Now

In this selection of short films, you can discover brand new Czech creations. It is a very diverse portfolio of contemporary Czech production offering shorts by students, films by experienced authors, and experimental works. Since of the main goals of Anifilm is to cover all domestic creations, the Czech Horizon (Český obzor) competition category was established recently. All of the films presented here took part in that national contest.
Pavel Horáček, program director

Digital Media, Hagenberg Campus

A behind-the-times fisherman leaves the safe harbor and sets outs to the open sea, two mail carriers deliver a huge eccentric package, a figure with an old-fashioned monitor plays a special version of the game rock-paper-scissors, a woman gets lost in a roundabout, and a gorilla eavesdrops on the conversation of two meerkats. This program features a selection of recent student works, ranging from narrative shorts to experimental animations, from the Digital Media Department at the University of Applied Sciences Upper Austria in Hagenberg.

Obscura, Elmar Glaubauf (AT)

Animationsinstitut of the Film Academy Baden-Württemberg

Animationsinstitut, part of Filmakademie Baden-Württemberg, is one of the world's leading film schools, offering the areas of study "Animation Artist," "Effects Artist," "Animation/ Effects Producing," "Technical Directing," and "Interactive Media." This screening features some of the latest and greatest student projects realized at Animationsinstitut.

Blieschow, Christoph Sarow (DE)

Tashikas Strange Adventure, Nao Sakamoto, Airi Sato (JP)

ISCA (International Students Creative Award)

ISCA (International Students Creative Award) is an international arts and information media competition for universities, graduate schools and vocational schools, sponsored by the Knowledge Capital Association. It is an international competition open to students from Japan and around the globe.

Japan Media Arts Festival 2019

The Japan Media Arts Festival honors outstanding works in a wide variety of media in four categories: art, entertainment, animation and manga. This program consists of various excellent films singled out for recognition by the 2019 Japan Media Arts Festival.

La Chute, Boris Labbé (FR)

Juergen Hagler (AT)

Expanded Animation 2019

OUT OF THE BOX

”Expanded Cinema” is everything that goes beyond conventional movie projection, and therefore ranges from multiple projections to the utopia of pill films and cloud projections [...] as well as from connection with other media [...] to the cinematic environment. Expanded Cinema is an attempt to push the boundaries of the movie screen.[1]

For seven years the symposium Expanded Animation has been researching contemporary positions at the intersection of technology, art, animation, and aesthetics under a different thematic focal point every year. This year’s edition takes the festival motto *Out of the Box — the Midlife Crisis of the Digital Revolution* and offers several panel discussions of current trends in the extended field of computer animation. *Out of the Box* in the sense of “thinking against all conventions” captures the basic essence of the Expanded Cinema movement, widely regarded as a pioneer of media art. As in the first conferences about computer animations within Ars Electronica during the 1980s, practice and theory are of equal importance. The symposium tries to give answers to current positions and presents approaches from the fields of art, research and industry.

The symposium starts with the Prix Forum, where the Prix Ars Electronica 2019 winners in the computer animation category present their awarded works. Following that, the anthology *Expanded Animation. Mapping an Unlimited Landscape*[2], will be displayed. The work contains a synopsis of lectures and artistic positions from the last five years and showcases a selection of contemporary artistic works from Prix Ars Electronica. The first panel is dedicated to the central topic *Out of the Box*: Jakob Schuh, multiple-award-winning animation filmmaker, and Klaudiusz Wesołowski, director at the award-winning animation studio Platige, are both textbook examples of a cinematic narration off the beaten path. Ina Conradi and Mark Chavez present an artistic research project about quantum theory, and media artist Pak will talk about his experiences in delegating the curator’s role to the machine, thereby involving public opinion, in order to reflect and reinforce current aesthetic trends.

The symposium opens a new chapter with the panel *Expanded Games*. The intersection between animation and games is elucidated from the angles of art, theory and practice. Filmmaker and game designer Michael Frei will grant insight into his artistic works, Miguel Sicart will give a lecture about the aesthetic experience of games, and Andreas Suika will talk about current workflows in the game industry.

The panel “Art and Industry” will once again present current trends from the applied artistic field of 3D animation and motion graphics.

Beeple — Mike Winkelmann provides insight into his artistic œuvre, the “everydays,” so-called “finger exercises” that are created on a single day. Beeple is among the pioneers of this genre — he has created over 4500 “everydays” during the last 12 years and enjoys cult status among his fanbase. Furthermore, the media designer Nidia Dias and the 3D artist and director Julius Steinhauser from the animation studio ZEITGUISED / foam studio will present applied works, from motion graphics to experimental 3D animations. Additionally, many of the presented works can be watched at the Ars Electronica Animation Screening and in the Deep Space 8K at the Ars Electronica Center.

Speakers at the 2019 Expanded Animation symposium: Prix Ars Electronica 2019 Winners in the category Computer Animation, Beeple — Mike Winkelmann (US), Mark Chavez (US), Nidia Dias (PT), Michael Frei (CH), Pak (TR), Jakob Schuh (DE), Miguel Sicart (DK), Andreas Suika (DE), Klaudiusz Wesołowski (PL) and ZEITGUISED / foam Studio — Julius Steinhauser.
Organization: Expanded Animation is produced jointly by the Upper Austria University of Applied Sciences’ Hagenberg Campus and the Festival Ars Electronica, and organized by Elmar Glaubauf, Jeremiah Diephuis, Juergen Hagler, Michael Lankes, Alexander Wilhelm / Upper Austria University of Applied Sciences’ Hagenberg Campus / Department Digital Media.
www.expandedanimation.com / www.fh-ooe.at

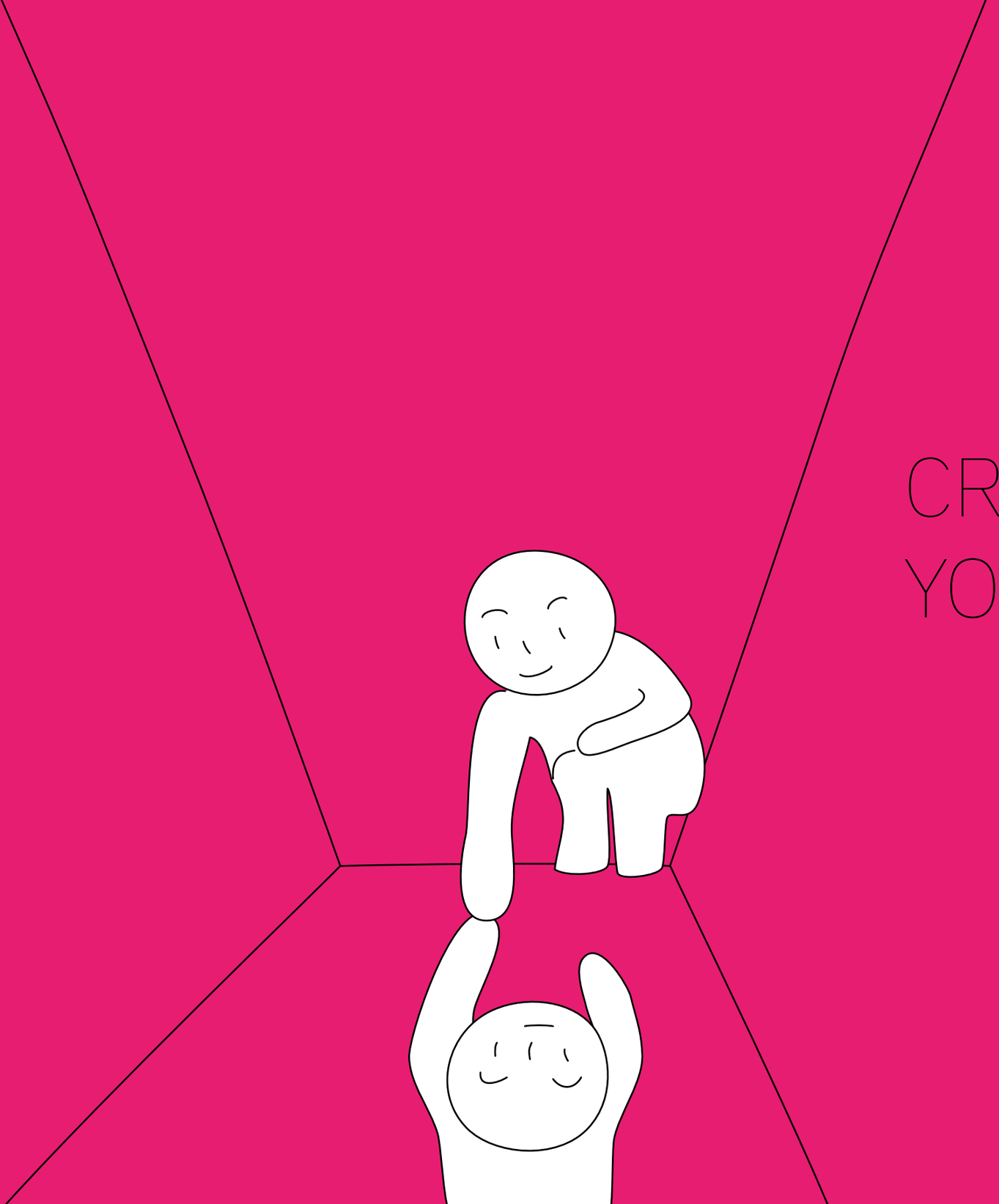
1 Hans Scheugl and Ernst Schmidt, Eine Subgeschichte des Films. Lexikon des Avantgarde-, Experimental- und Undergroundfilms (Frankfurt a. M.:, 1974), p. 253.
2 Juergen Hagler et al., eds., Expanded Animation. Mapping an Unlimited Landscape (Hatje Cantz, 2019).

EXPANDED GAMES

Digital games have long since left their original residences in living rooms and hallowed arcade halls and can now be played virtually anywhere, sometimes integrating real-world data to create hybrid realities or being used for a variety of purposes beyond sheer entertainment. In conjunction with the “Expanded Animation” Symposium, “Expanded Games” explores game projects that “think outside the box,” featuring innovative game mechanics, explorative usage of content and interesting applications of game technology. A selection of student games from the Media Technology and Design, Interactive Media and Digital Arts programs at the Hagenberg Campus of the University of Applied Sciences Upper Austria serves as a resource for a playful reflection on the blurred borders between digital games and other forms of media and media art.

Jeremiah Diephuis (US), Juergen Hagler (AT), Michael Lankes (AT)

With games by: Philipp Brantner (AT), Maximilian Fölss (AT), Florian Friedrich (AT), Miriam Hager (AT), Peter Hofbauer (AT), Bernhard Hofer (AT), Jakob Januschkowetz (AT), Dominik Hackl (AT), Michael Klammer (AT), Gabriel Mittermair (AT), Matthias Patscheider (IT), Lukas Paul (AT), Markus Ploier (AT), Samantha Povolny (AT), Viktoria Ronacher (AT), Florian Schmidt (AT), Lukas Stöbich (AT), Katrin Tieber (AT), Alessa Wolfram (AT), Maximilian Wöß (AT), Bianca Zankl (AT)



CREATE
YOUR WORLD

CREATE YOUR WORLD 2019
Future Festival of the Next Generation

The Future of Communication

The social intelligence of present times

What does it take to improve our lives together now and in the future? How can we structure decisions in a better way? Which processes should be rethought? What is wrong with our communication culture right now?
These are questions that CREATE YOUR WORLD poses to many different generations this year, presenting a multitude of ideas and projects by regional and international artists.
What should present and future communication look like, in the digital realm and in general?

The future is the past?

Why should I go to school, if I probably won't have a future? This statement is currently circulating all over the world. Indeed, it's now becoming slowly but surely visible what we have failed to do in the past. What could have been done differently? How should we have communicated with each other? But this is not what we want to ask — instead, the platform CREATE YOUR WORLD is meant to inspire thinking about an optimized and positive form of communication dealing with the present age.

Quiet Zone

"You've already seen the message, but you still haven't answered!" Currently there aren't that many situations left where we are completely on our own. We are pursued, we accept surveillance, we often spend a whole day without talking, yet communicate more. These forms of communication create an increasing level of stress for both recipient and sender...

Vog.photo

Hebocon

Vog.photo

Jugend Hackt Zone, Jugend Hackt (AT)

BASICS

Another focus of this year's CREATE YOUR WORLD festival is the communication of fundamental information about complex technologies such as artificial intelligence, robotics, virtual reality and much more. As technologies creep into our everyday life, all of a sudden we find ourselves using multiple digital means of communication and utilities without questioning them or even understanding how they work. Therefore, a development such as artificial intelligence may almost seem like a threat from another world — there is respect, skepticism, and also fear. Yet, in fact this "intelligence" comes from ourselves: it was us who developed and created it.

At CREATE YOUR WORLD, we are allowed to admit to not knowing how all that really works. We have a chance to experience how all of this started and how fascinating it can be at the same time.
The festival within the festival demonstrates complex technologies to touch and try out — and we really are allowed to start from scratch. No matter what age we are, these topics are relevant to us all, and in the comfortable festival atmosphere we can gather information and exchange with others. For it's only in collective and active dialog that we can find out time and time again, how we want to design our lives together.

Vog.photo

The Error City, Otelo eGen (AT)

Jugend Hackt Zone, Jugend Hackt (AT)

The **create your world** festival is *the* center for creative projects and ideas. As an independent festival within the framework of the annual Ars Electronica Festival, it is just the perfect place to access the international artist network of Ars Electronica. Many artists, associations and innovative companies are part of the **create your world** festival, making it a unique meeting point for people interested in the future. New technologies, unusual models and concepts of living, innovative ideas and approaches for the world of tomorrow are being tested as an "open lab experiment." The perfect place for tinkerers, lateral thinkers and those with a thirst for knowledge!

FABLAB

Mira Alida Haberfellner (AT), Elisabeth Valarie Maurer (AT), Textiles Zentrum Haslach (AT), Ars Electronica (AT)

FabLab 2019 is a mobile textile laboratory. In an open-manufacturing format, non-digitally controlled forms of work processes are communicated. It's the place to print, sew, fold, and above all, experiment. It's all about fun, according to the motto "back to the basics." Getting to know old traditions and rediscovering them. The joy of doing and experimenting is central, and everyone's invited! The end result is not a temporary message in the world wide web, but rather an individual piece of art to take back home or a communal total work of art created by the commitment of the festival-goers. Communication done differently!
How does a hand loom actually work? How are pleats created?
All of these questions can be experienced and answered in actual practice at *FabLab*.

Elisabeth Maurer

FABLAB, Anilin unfolded1

Elke Hackl

HUMAN CYBORG

Borg Bad Leonfelden (AT), Elke Hackl (AT)

"Humans must become cyborgs to stay relevant."
Elon Musk

How would the world look if Elon Musk were right?
In this new, better world it wouldn't be the robots who rule, but humans with high-tech bodies. While in today's world, enhanced versions of the ephemeral body are preferably hidden or forced into a humanoid form, the future will be dominated by self-evident and visible extensions, high-tech extremities and sensory systems.
We want to imagine how these cyborgs could look and approximate what could be possible tomorrow: cybernetic hybrid organisms, functionally improved human or humanoid life forms that are among us as a matter of course.
But which functions are worth improving, if we shift our concept of the human condition past the biological realm in order to stay relevant as humans, as Elon Musk suggests?
Ultimately we are constructing simple extensions to approach the Human Cyborg phenomenon.

SOCIAL INTELLIGENCE AGENCY (SIA)

Landestheater Linz (AT), Ars Electronica

BE PART OF SIA — THE WORLD NEEDS YOU

The digital revolution is in full swing. And now what? Between smart phone and tablet, between VR and AI we are on a quest for something our modern technology doesn't yet possess: social intelligence. Without that, our world is in danger of becoming a dark place. The solution: *SIA*. The aim: Nothing less than to save the world! With young people from Upper Austria, CREATE YOUR WORLD and the Landestheater Linz, *SIA* will be brought to life. We will ask ourselves what our world would need the most. Out of the digital comfort zone and into real life.
We will develop, discuss, try out and train playfully in workshops and fulfill missions during Ars Electronica Festival 2019.

Hermann Posch

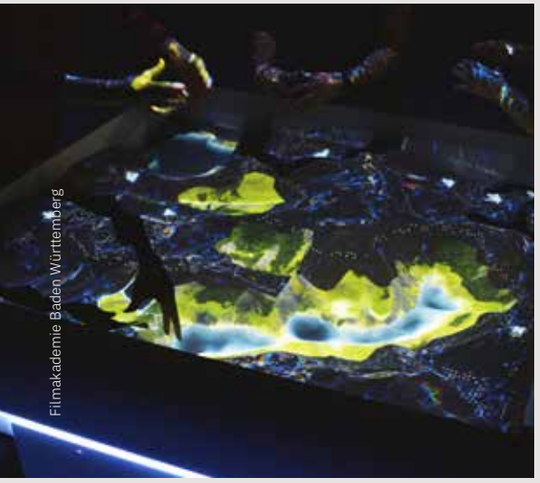
GRAFFITI

Reclaim the walls/No demolition please

Walze (AT)

GRAFFITI has long been established as a modern art form. Its often very direct nature is especially appealing to youth. Art in public space has generally enhanced our cityscapes, so colorful walls are a must for the festival area.
Visual communication in a slightly different format and legal, too!

Jonas Fliedl



Filmakademie Baden Württemberg

What a wonderful world

Dominik Schön (DE), Elias Kremer (DE)

Wonderful World is a play/art installation in which the players must work together cooperatively to fill a dark, digital world piece by piece with nature. This is achieved by capturing floating fragments of light with the shadow of one's own hands and collecting them in a hollow in the sand. Since the projection of nature changes with the shape of the sand, each natural landscape that the players uncover is completely different. After the players have successfully filled the tables, they can become active themselves and design the resulting landscape according to their imagination.
The game makes the current trend "Augmented Reality" tangible: Fast interaction feedback, intuitive controls and enchanting graphics make this sandbox game a magical experience.
The game was developed in a four-month project phase during our studies at the Filmakademie Baden-Württemberg.

Tom Mesic

PRIX ARS ELECTRONICA

u19 — create your world Exhibition

YOUNG CREATIVES AND YOUNG PROFESSIONALS

In 2019 the category u19 — CREATE YOUR WORLD of Prix Ars Electronica was divided into two subcategories: At YOUNG CREATIVES (up to age 14) the first ideas and projects can be applied. The co-creation of future and present from the perspective of children is impressively demonstrated in this subcategory. At YOUNG PROFESSIONALS (age 14 — 19) there is a quest for innovative lateral thinkers who have developed an artistic and/or critical project for the world of tomorrow. The u19 exhibition invites all winners to show their projects or further develop them within an open lab, together with the visitors. Here the future prize winners can get some inspiration! In the dedicated u19 atelier the young people present the way they work and how they shape their ideas for implementation.

u19 Ceremony

The u19 Ceremony is the central highlight at the CREATE YOUR WORLD Festival: All 24 winning projects will be awarded and presented in a fun and comfortable setting. The event is directly integrated into the bustling activity of the Festival and has become a particularly popular fixture of the whole Festival.

From idea to summer project… Opportunities for young people through participation at Prix Ars Electronica

Over 700 applications were received this year in the u19 category of Prix Ars Electronica. This high number makes it more and more difficult for the jury to select the winners — and still only 24 projects can be awarded. But: for a couple of years, the CREATE YOUR WORLD team has focused on fostering and supporting those project groups who despite their high quality couldn't be among the awarded projects. On the one hand, relevant projects will be invited to the festival as Additional Prix Projects and can be presented there to the visitors. And on the other hand, CREATE YOUR WORLD tries to be a facilitator for "summer jobs" for young people — and fortunately in a very successful way: during the numerous cooperation talks there is always the consideration of young people potentially accepting a commissioned project from certain companies, in order to get a truly authentic evaluation for them, and at the same time creating a product for the companies to use for further research or development purposes. The CREATE YOUR WORLD team searched for appropriate projects and was able to procure paid commission work for five project groups this year.

PRIX ARS ELECTRONICA u19 — create your world
additional projects

In this Open Space, projects and ideas will be presented from young people who have applied for Prix Ars Electronica in the u19 category. With this focus, CREATE YOUR WORLD is set to support all those projects that are not among the winners. Here they can be immersed in the festival network here and gain a lot of experience for developing their ideas and projects further.

Birte Brudermann

Barbara Gregori

WHO IS CIHAN?

Pupils of the 1DS of the Business Academy Donaustadt (AT), Birte Brudermann (AT)

A film on the topic of “identity.” 25 personal interviews with the following rule: “Describe your identity without mentioning name, origins, mother language, ethnic background, born gender.” The contents of the text, the person reading the text and the person visible in the images are three independent components. Together, they form a fictitious identity.
Only the texts seen in the subtitles are from the person visible on screen.

INTERACTIVE COVER

Barbara Gregori, Claudio Reiter, Felix Strobl, Gregor Kosian (AT)

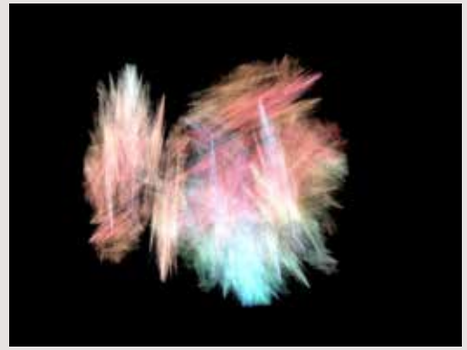
Ever since the invention of woodblock printing around 650 BC, various forms of reproduction have accompanied us. Yet the digital revolution has caused a change which today’s magazines and newspapers haven’t yet caught up with: interactivity. The project *Interactive Cover* gives readers the opportunity to feel the community behind the medium and create unique and mutable works of art together: globally, interlinked, and in real-time.

E-DICE

Lukas Bittner (AT), Lorenzo Arturo (AT), Adam Musiejovsky (AT), Fabian Ortner (AT)

The *E-Dice* is a dice for the 21st century. By combining an accelerometer with several controllable LEDs, a new and diverse game experience is achieved. Even more possibilities are created by generating random numbers between 1 and 9!

Lorenzo Arturo



Claudio Reiter

IN REACTIO VERITAS

Felix Strobl (AT), Barbara Gregori (AT), Claudio Reiter (AT)

Conflict and dispute are older than humanity itself, yet the term “confrontation” still has a primarily negative connotation. *In Reactio Veritas* is set to challenge this by generating algorithmic works of art through electro-encephalography, which does not merely analyze the dispute, but should inspire us to see the beauty and communality behind the conflict.

BEGEGNUNG IM ÖFFENTLICHEN RAUM

Artur Schernthaner-Lourdesamy, Vincent Entekhabi (AT)

This installation addresses interaction in public spaces on an auditory and visual level. In a video installation, an objective view of an encounter is created. The spectator watches separate worlds collide, merge and avoid each other. In contrast to the visual representation, the auditory material is reproduced subjectively. In an interplay of confused everyday noises and musical improvisation on the double bass and piano, a carpet of sound is created in reflection of the visual depiction.

Artur Schernthaner-Lourdesamy

CODER DOJO

CoderDojo Linz (AT)

Children will be able to program their first computer game at the *CoderDojo*. The development environment is going to be Scratch. The game's complexity can be adapted to the children's previous knowledge. Those who are more into electronics can instead realize a simple electronic project with a soldering iron. Kids and young people with a lot of programming experience under their belt can learn how to program a website with the Mentoring Team of *CoderDojo*. The *CoderDojo* team will provide instruction manuals for inspiration that can be followed while programming or assembling. Kids with more experience with Scratch, e.g from school lessons or the *CoderDojo*, can let their imagination run free and implement their own game-related ideas.

ABC-DOJO

Pädagogische Hochschule Oberösterreich (Teachers' College of Upper Austria) — Education Innovation Studio (AT)

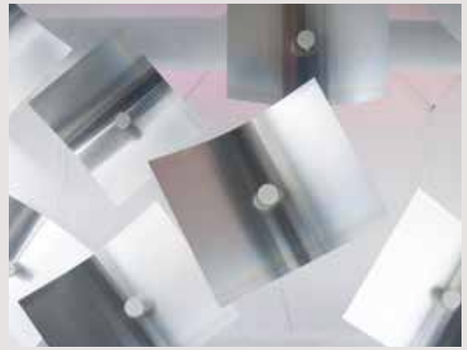
At the *abc-Dojo* you can program floor robots and try to trick an artificial intelligence or even create a speaking image! Floor robots on a treasure quest, portals with face recognition, or speaking images made with MakeyMakey: All of this can be experienced at this year's AI lab for children and beginners.

Rainer Stropek

COMMON SENSE

Kevin Strüber (DE)

Common Sense is an interactive sound installation consisting of several sound creatures. Through sound pressure transducers, piezo microphones, and a custom algorithm, the surrounding ambience can be perceived, analyzed and imitated. The creatures thus exchange with each other and develop a sonic swarm behavior. An ebb and flow of sonic experience, with the visitors as an active and crucial contributing factor.



Linda Schäffler

ZAPZARAP

Tanja Neubäck (AT), Michael Friedl (AT), Marija Milenkovic (AT), Lina Dengg (AT)

The game *ZAPZARAP* presented in the shape of an arcade game, seeks to call attention to social problems related to the (post)colonial exploitation of Africa. A special focus lies on the emancipation of identity markers that were previously underrepresented in the world of games: the heroine is a woman of color. It aims to make the industry as well as the relatively young demographic reflect, in addition to confronting the subject matter.

MUSIC RESEARCH LAB

mica — music austria (AT), FH St. Pölten (AT), Ars Electronica (AT)

Festival-goers are invited here to produce sounds, atmospheres and short pieces of music on their own, which will then be used for digital games, animations, and live-action films or situations. Free from any restrictions of genre or style, music will revert to one of its original functions: an ambassador of emotions providing the various projects with sounds that may both irritate and amuse.
In this year's music research lab, there will also be a presentation of semester projects by students of the FH St. Pölten, and mica — music austria, creating various formats with the focus on game sound and the music business. This amalgam of various themes offers a broad scale for the festival-goers and invites us to explore and experiment.

Vog.photo

FM4 SPIELEKAMMERL

ORF radio FM4 (AT)

FM4 Spielekammerl is a weekly variety game-streaming format on Twitch.tv that goes live every Thursday from 5 to 9 pm. "Spielekammerl" is an Austrian expression for a small, charming room where you play video games. Sometimes, the *Spielekammerl* goes on tour, too. Then we stream live from Ars Electronica Festival, for example! FM4's video game staff is playing different games all the time — some newer, some not so new. We are also conducting interviews with guests from different fields.

Video games and video game culture are our main focus, but we don't stop there. Hanging out at *FM4 Spielekammerl* is easy-going and fun. It's about talking and having a good time. And it's a proven fact that playing video games often helps with that!

FM4 EXTRALEBEN

ORF radio FM4 (AT)

Founded in the fall of 2013 by the three-member team of editors, Conny Lee, Rainer Sigl and Robert Glashütter, the monthly radio program *FM4 Extraleben* has the motto "Let's talk about computer games." Each episode is dedicated to a specific topic, examined from the perspective of various aspects of digital game culture — such as work, architecture, sexuality, health, realism or learning. *FM4 Extraleben* is characterized by well-researched yet casual, sociable, and understandable talks, collectively negotiating arguments, exploring aspects and exchanging theme-specific/relevant anecdotes. Products (certain games) and reviews are secondary to *FM4 Extraleben*, the focus being on playfully conducted debates and analyses around game culture.

SUMMER SESSIONS

Arbeiterkammer OÖ (AT)

create (y)our digital world

The *Summer Sessions* are serving as a preparation for this year's CREATE YOUR WORLD festival in cooperation with the Upper Austrian Chamber of Labor. Building robots, programming games, soldering boards, discovering Arduino, drawing digital graffiti, experiencing virtual reality, becoming a cyborg — or simply dropping everything: At the *AK summer sessions* young people between 15 and 19 can try out the future over the course of five days.

SUMMER FEELING IN TRAUN/OÖ

Various artists will gather in Traun to look into the future together with young people and develop new ideas, to be presented at Ars Electronica 2019.

CINEMA 4D — JUGEND-BEGEGNUNGSPROJEKT 2019

Participants of mb21 Dresden (DE),
c3 Budapest (HU), bug'n'play Zürich (CH)

The youth exchange project is a workshop with an international group of students taking place in POSTCITY over the entire festival period.
Every year CREATE YOUR WORLD invites 20 international students to spend five days at the Ars Electronica Festival, where they can create a game, a film, or a sound project and experiment with new forms of technology. It is always a lot of fun and offers the chance to experience new things and meet interesting people.
This year's youth exchange project is entitled *Cinema 4D Animation*. Young international people will experiment with technology and learn 3D animation basics together with experts. With the high-end software "Maxon Cinema 4D," they will work with 3D characters, make their own sequences, and create their own 3D animation.

ABLETON x MI.MU GLOVES

ABLETON (DE)

Pushing buttons and turning dials often doesn't translate well for an audience; however, new technologies have emerged that allow for increased dynamic and expressive control of music software and electronic instruments using hand and body gestures.
At this year's Ars Electronica, Ableton certified trainer Madeleine Bloom will demonstrate how she uses MI.MU gloves to generate and control sound and music with Push and Ableton Live, creating a more immediate and visually engaging experience for audience and performer alike.

Clemens Fantur

FM4 EXTRALEBEN

Valentin Ortner

Valentin Ortner

CINEMA 4D — JUGENDBEGEGNUNGSPROJEKT 2019

Tom Mesic

SUMMER SESSIONS (AK OÖ)

ABLETON

ABLETON x MI.MU GLOVES

LITERALLY OUT OF THE BOX — analogue playground

Spieleagentur White Castle (AT)

A game is an experience. A game is a microcosm with its own code. A game is a space of symbolic actions. A game is a medium. The ANALOG game is a complex microcosm in a cardboard box.
The analog game is a unique medium, which allows a topic to be not only communicated but experienced: The content of a game box (its material, design, set of rules) provides us with all necessary basics to experience the contained microcosm. But “out of the box” comes neither a digital engine, nor a built-in tutor that keeps us from breaking out of the set of rules created by the designers. The content of a small box is sufficient to bring a complex world to life.
Which basics are required for the creation of such a world? How can game designers accomplish the feat to make such a complex world learnable? And how can one motivate the game players to reflect at all times on whether their actions make sense within this microcosm?
Designing analog games requires not only the fine art of creating an intuitive symbiosis of material, narrative, design and possible actions, but also the art of communicating it comprehensibly.
In the White Castle gaming booths, you can actively participate in such design processes and reflect on collective gaming, with both young and experienced game designers, the strengths and weak points of the prototypes at hand.
There will also be time slots where you can present your own prototypes.

Anita Landgraf

BRAIN LAB

Adela Perte (AT)

With the *BrainLab* you can create an insight into the activities of a youthful brain and get to know its full complexity through experimenting. In a playful way you can learn at various stations how the brain works, how our feelings and thoughts are created, how we appropriate new things and understand the brain as a plastic, emotional and social organ.

Tom Mesic

STAHLSTADT

NEUES LINZER THEATER (AT)

Young asylum seekers in Upper Austria face an increasingly tough climate. As diverse as they are, they all have questions regarding work, education, language acquisition, love and self-presentation, and social media in common. *STAHLSTADT. ONLINE* is an alternate-reality game where young people themselves have created an alternate reality — Linz becomes "Stahlstadt." From February to July 2019, there are monthly work meetings and workshops, where the adolescents are writing the history of *Stahlstadt* together.

At the beginning of September the core group of 25 members, together with 2 actors and all regional and transregional cooperation partners, will narrate the history of *Stahlstadt*. Until now we only know that magic portals will emerge at the Ars Elecrtonic 2019 that will "swallow up" young people in stress situations. But everything else stays "top secret." Our Youtubers and Instragrammers already report from the *Stahlstadt* as @LINZLIEBE. Let's solve the mystery together!

Neues Linzer Theater

IN_VISIBLE ISLAND

Ruhiyati Idayu Abu Talib (MY), Predrag K. Nikolic (CN/RS), Mohd Shahrizal Sunar (MY)

In_Visible Island is a multi-sensory platform that offers visually impaired children an opportunity to experience interactive, non-linear, multi-sensory storytelling while actively involving them in creating stories with their sighted peers. It is a multimodal modular table supported by multi-sensory disks capable of producing sound and vibration, and able to detect gestures in the progressive context of the storyline, while triggering the central computer to generate the next part of the story.

WORDLAB/WORTSCHMIEDE

Create your own word

In the era of digital communication, words are often only displayed as signs, codes or acronyms. A mix of various languages is an everyday commonality and new linguistic trends are emerging. Within the focus of "The Future of Communication," new words or non-words can emerge from this *wordlab*. In a transgenerational word (clarification) lab, the festival-goers can create new words and let their definitions grow.
What do: hdl, xox, abf, bff, dau, eob, irl, kwt mean? What is a "Schnirrsenkl" and what does "derrisch" imply? Maybe this could even be the birthplace of one or more imaginary jobs that will become reality only in the future?

Vog.photo

ARTIFICIAL INTELLIGENCE LAB

Melina Undesser (AT), Sebastian Lindinger (AT), software architects (AT)

A traditional strong point of computers is their ability to execute precise calculations. This helps us transmit data, navigate cars, or fly into space. But when it's about interpreting perceptions of our environment, things that are trivial to humans pose a tremendous challenge to computers. Over the last years there have been great advancements in technologies, commonly called artifical intelligence (AI) or machine learning (ML). By applying them, we can literally teach computers things that would have been unthinkable to program just a couple of years ago.
In the presented project, two adolescents will realize a project for the Ars Electronica Festival where a simple computer game will become controllable via gestures such as head movements or facial expressions. The aim is to work out an installation for September 2019, where visitors of all ages will be able to track and comprehend the work of the two contributors, customize their own variants of the game, and learn something about the functionality of AI. The project should demonstrate on the one hand that even young people with little programming experience are able to put AI to effective use in their own software projects. And on the other hand, the project should help to familiarize the participants with AI during the festival in a playful way, fostering an interesting discourse about the possibilities, boundaries and dangers of this technology.

This project is presented in the framework of the European ARTificial Intelligence Lab and co-funded by the Creative Europe Programme of the European Union.

MORGENESSEN

Alfred Pointner (AT)

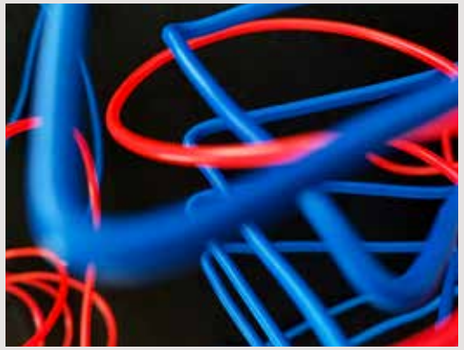
A flowerpot as a cooking appliance

Clay as a material has been in use for thousands of years. The basic ingredients are earth and water. During the process of drying and baking, hot air is added. "Earthen" vessels have long been used by humans for the production and storage of food and drinks. Depending on the modernization level of some cultures, earthenware was replaced by more durable materials such as metals and plastics during the last 40 to 100 years. Cooking in a flowerpot is not an everyday solution. But it is possible to see, feel and taste the material's advantages. Clay radiates a "pleasant" heat. The porosity of the material regulates the ambient humidity. Recycling terracotta products is very easy. After crushing or grinding, the former implement becomes a natural element of the earth again. Flowerpots are filled with the ingredients of a breakfast meal. From vegetables, fruits, cereals, and legumes one sweet and one spicy variant will be created. Steaming or baking in the earthenware produces the final result.

BE WIRED

Judith Auer (AT), Claudia Cruceru (AT), Raphaela Danner (AT), Maria-Anna Eckerstorfer (AT), Gerda Martinez Lopez (AT), Adina Socoliuc (AT)

How is it possible to draw sculpturally with wire? Who will continue the construction and at what point? And how is the sculpture going to be illuminated? Where to install the switches? Students of drawing at Art University Linz will collaborate with visitors to the Festival to make an interactive wire sculpture. The main focus is on collective work and interacting with sculpture, human beings, and electric energy. Various colored wires are woven with light chains and controlled by simple DIY switches. Additionally, a fast-motion movie will document the process of creation. The visitors can join the construction work in the open workshop or playfully find out which way the electricity flows.



Raphaela Danner

Oneshots

YOUKI (AT)

Cutting edge film production: with smart phones and simple microphones, “one shots” can be produced at the Festival film set. Here the story is always going on: like a chain letter, the visitors can continue telling the story, but only via “one shots,” film sequences without any edits. The scenes will later be edited together at YOUKI Open Lab. How will the story start and how will it end? The music to the film is also made by festival-goers — right from the music research lab.

MOOD ZUR KOMMUNIKATION

Bettina Gangl (AT), Birgit Pölz (AT), Helmut Doblhofer (AT), participants in Virtual Office FAB Linz (AT)

Mood to communicate. Communication often requires some courage, yet sometimes it happens in a seemingly automatic way. The young people of the *Virtual Office* researched and worked on some relevant issues of communication. Together with the visitors, an atmospheric picture is created, describing the positions the visitors assume when confronted with the new communication media.
The burning issue of preferred ways of future communication was the topic of an Arduino workshop the young people had taken part in.

MATHRIX

Hakan Lidbo (SE), Per-Olov Jernberg (SE), Johan Eriksson (SE)

Mathrix is a complex, multi-layered modular synthesizer and a strategic board game at the same time. Four players create improvised music with the non-linear sequencer by re-patching the sounds and at the same time aim to take the opponent’s pieces and win the game. *Mathrix* is not built for us, the humans we are today, but for the humans we might become in the future. If we then truly merge with digital intelligence and learn new abilities, e.g. to think in multiple layers and purposes, we might also be able to master *Mathrix*.

MATHRIX

OMAi

Tagtool Projection Mapping

OMAi (AT)

Tagtool Community Showcase

For over 10 years now, building façades and stage sets worldwide have been illuminated with spontaneous images rendered and animated live. The people who make this happen are members of the *Tagtool* community; what they have in common is an alternative vision of digital art. They work on the street or in the theater instead of in front of a computer screen, jam like jazz musicians, and seek new forms of visual expression.
In the framework of the Ars Electronica Festival 2019, works from the international *Tagtool* Community are interactively presented at the *Tagtool*-Station in POSTCITY. Festival-goers of all ages are invited to get hands-on experience with projection painting.

Vog.photo

FUTURE ZONE

Otelo — Martin Hollinetz (AT), Flora Nimue Hollinetz (AT), Lea Felicita Haslmair (AT)

The noise of silence

A place of silence but not silent at all. In the Noise of Silence Dome talking is forbidden, only the smart phone or tablet may serve as a means of communication. It is silent, but is it calm, too? In the NOS Dome your own digital noise can be traced back in the silence of the Dome.

Ket Zone

Children experience the digital realm — a little world of experience and relaxation for the youngest visitors. Five areas are open for them to explore and broaden their minds. Projects include a small robot that can be constructed and printed in the Robomat assembly, and personalized later.

SDGone

The UN action plan "Transformation of Our World: Agenda 2030 for Sustainable Development" is increasingly becoming the base for the development of the next years. It's time to form a personal attitude and orientation towards the 17 goals of the UN. We offer insight into four selected goals, provide practical examples of applications and start a cooperative development project together with the festival-goers.

Conferences @ CREATE YOUR WORLD

Symposium "Perspectives of Political Studies"

Let's argue. Conflict culture in the age of digital battlefields

Conflicts and fights have been with humanity since primeval times. In an ideal case they are a prime mover for societal development, in the worst case they set free destructive powers of incommensurable strength, combined with human suffering and ecological, economic, and political catastrophes. Only the development and cultivation of a conflict and fight culture under humanistic premises can provide a positive rethinking of this potentially destructive force. The symposium seeks to investigate the degree to which social media can contribute anything to a new culture of conflict and fighting or if these media obstruct such a culture, whether digitalization has changed communication, cooperation, and opportunities for manipulation and, last but not least, whether new forms of conflicts would emerge through the digital transformation of society. In lectures and workshops, new socio-political repercussions are demonstrated and discussed on various levels, pondering the consequences for a new realignment of political education regarding the development of personality and living together in society, while working on and presenting practice-oriented strategies for implementation.

An event produced jointly by the Upper Austria Teacher-Training College, Upper Austria Chamber of Labor and Ars Electronica

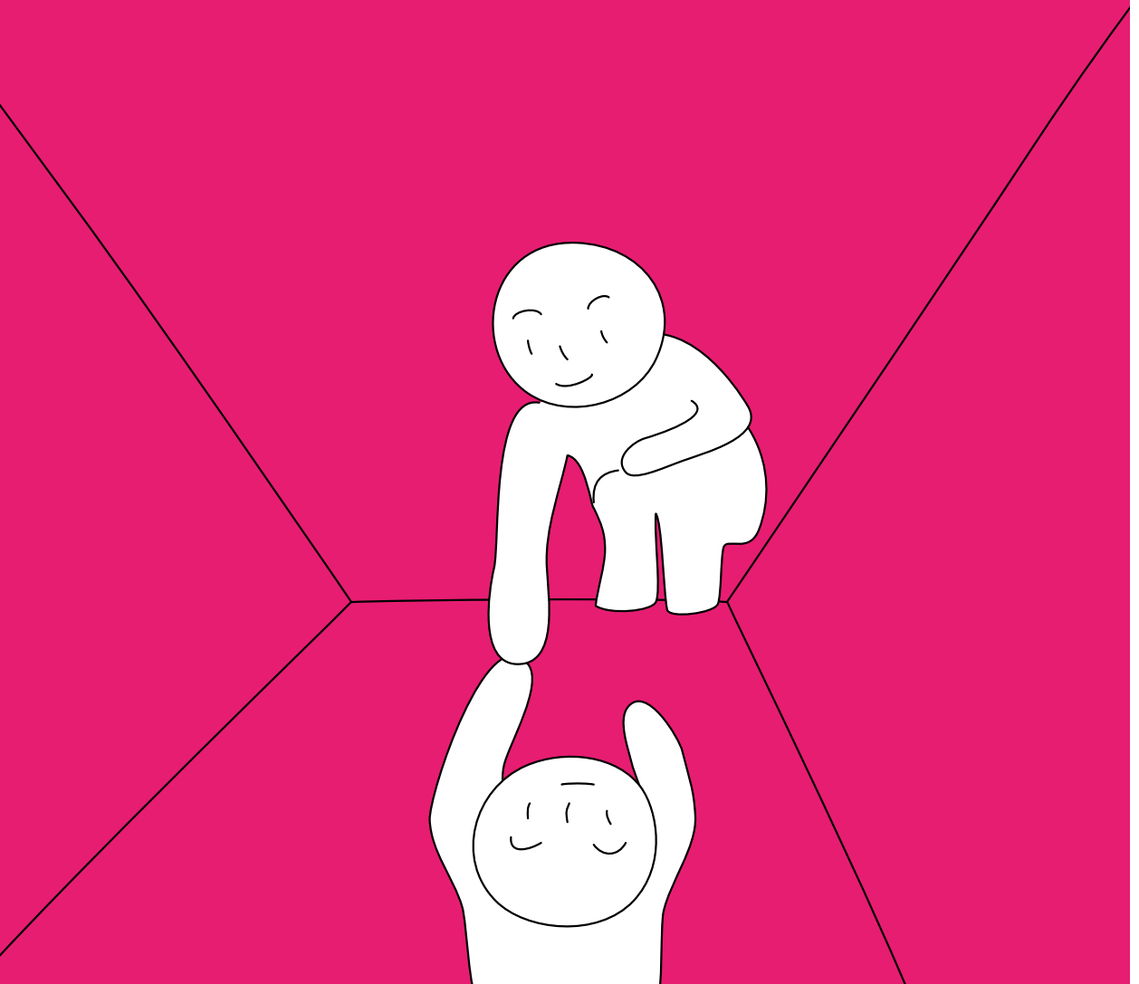
ZusammenHelfen Conference: Day of Encouragement

ZusammenHelfen in Oberösterreich — Gemeinsam für geflüchtete Menschen (AT)

This is the fifth consecutive year that *ZusammenHelfen in Oberösterreich — Gemeinsam für geflüchtete Menschen* is staging a conference for all those who are committed to and interested in helping people forced to flee, or are affected by refugees and integration. This year's conclave entitled "Day of Encouragement" will scrutinize new prospects, discuss the latest developments and challenges, and elaborate on successful projects. One inspiring speaker on the program is Jad Turjman, who will recount anecdotes from his life as described in his book *Wenn der Jasmin auswandert*. Dirk Baier, head of the Institute for Delinquency and criminal prevention of the University of Zurich and the communication project #ichbinhier will also enrich the conference.

Tom Mesic

GUEST PROJECTS



Chilean Artists at the Ars Electronica Festival

The *Chilean Artists at the Ars Electronica Festival* program debuted in 2018 with a successful cooperation between the Ministerio de las Culturas, las Artes y el Patrimonio, the Ministerio de Relaciones Exteriores | Gobierno de Chile and Ars Electronica. The collaboration continued in 2019 with an open call asking for artists, scientists, designers, researchers, entrepreneurs and social activists from Chile or with a Chilean background to participate in this year's festival. Five projects were selected and will be showcased throughout the Ars Electronica Festival 2019.

Constanza Piña (CL)

KHIPU

Electrotextile prehispanic computer

The Inca *khipu* are textile devices for recording information, made of cotton or camelid fiber strings that store data coded as knots. This piece is an open-source textile computer based on the manufacture of astronomical khipu, the cords of which were hand-spun with alpaca wool and copper wire. It functions as an antenna for electromagnetic fields that is connected to an amplifier circuit. The encoded data in it corresponds to: a spectral classification of the stars in the Boötes constellation; a lunar calendar; a solar eclipse; two earthquakes, and the elliptic position of the sun and moon at the time of our births. This project is a sound and arts interpretation of the technology, wisdom and history of our ancestors, meant to express how the universe is governed by harmonious numerical proportions. What we are hearing now is thus the amplification of inaudible Space, the voices of specters visiting the void, a celestial score, the music of the spheres: the voice of silence.

Direction and Concept: Constanza Piña
Realization: Melissa Aguilar, Ana Cervantes, Ana Ortiz, Daniela Sofía Main Reyes, Constanza Piña
Electronics: Constanza Piña
Graphic and editorial design: Melissa Aguilar
Technical assistance: Alexandre Castonguay
Made in MedialabMX (Mexico City) and Perte de Signal (Montreal).
Supported by Ministerio de las Culturas, las Artes y el Patrimonio and the Ministerio de Relaciones Exteriores | Gobierno de Chile

Perte de signal, Camille Montuelle

Jean Danton Laffert (CL), Karin Astudillo (CL), Camilo Gouet (CL)

Meditative Symbiosis

Meditative Symbiosis is a trans-disciplinary project that explores the interdependence of a living organism and an electronic system, looking for the aesthetic result of a digital-biological process.
The installation is composed of containers with plants (*Soleirolia soleirolii*) and sensors inside. The photosynthetic activity of the plants is sensed by the carbon dioxide absorption rate. This information is then sent to a computer module, which processes the data to create graphic patterns in real time. These are then projected on the surface plants, influencing photosynthesis by the light intensity of the figures.

The process generates a cycle of constant and mutual dependence: while the plants grow, the digital image evolves from the data supplied by them, producing a bio-electronic aesthetic that evolves in time.

This project is supported by: Fablab U.Chile. Research laboratory. Technical and staff support.
Development team:
Sensor and electronic interfaces: Esteban Norambuena
Computer platform and programming: Mauricio Hormazabal
Second scientific support: Daniel Opazo Bunster
Automatization interfaces: Nicolás Briceño
Supported by Ministerio de las Culturas, las Artes y el Patrimonio and the Ministerio de Relaciones Exteriores | Gobierno de Chile

Mónica Bate (CL)

The Life of Crystals

[C][O][R][O]

The *TLC* project started with a simple and familiar question: “How does this work?” Though this may be a recurring for those who live surrounded by machines, it doesn’t imply that we’ve surpassed our ‘black box-like’ relationship with certain types of technology. With this conceptual outline, the *TLC* project proposes to observe a material that’s profusely used in electronics and a widely known phenomenon: piezoelectricity. At the intersection of the natural and the artificial, between life and the machine, art and science; technology will be re-purposed in a way that isn’t practical or efficient, but poetic and symbolic. The archeology of matter will lead us to reflect on our dominion of it, and to see it as transformed natural matter for which humans play an evolutionary role.

Collaborators:
Antonio Galdámez PhD, Department of Chemistry, Universidad de Chile.
Sound: Claudio Muñoz
Artist-Engineer: Álvaro Pimentel

Supported by Departamento de Artes Visuales — Universidad de Chile, MediaMAC-Anilla, Fundación Flores, Ministerio de las Culturas, las Artes y el Patrimonio and the Ministerio de Relaciones Exteriores | Gobierno de Chile

Camila Estrella

Carla Bolgeri (CL/IT), Francisco Marín (CL)

Vocals

The main idea of this piece is to amplify the voice in the performance space through a live sound system. The sonic power of speech in an acoustic and corporeal practice that uses the sound of languages in an attempt to transform the expressive experience that operates within our communicative processes into other possible configurations of meaning. Encounters of real and invented languages overlap in meanings, sounds, vocals, consonants, etc., in diverse forms of voices, produced by a microphone that is amplified and processed live. The performer's voice and the reproduction of that voice are taking place as the performance occurs.
This project is an invitation to visualize the movements of language as a flow of sonic processes in space and in the body.

Direction: Carla Bolgeri
Art: BOLGERI & MARÍN
Music and sound design: Francisco Marín
Peformer: Carla Bolgeri
Illumination design: Jonathan Inostroza
Costume Design: Evita Hidalgo
This project is supported by Center of Creation and Residence NAVE, Ministerio de las Culturas, las Artes y el Patrimonio and the Ministerio de Relaciones Exteriores | Gobierno de Chile

Isabel Ortiz

Gonzalo Mezza (CL), Sebastian Vidal Valenzuela (CL)

Mezza: Archivo Liberado

Mezza: Archivo Liberado is a curatorial project that reviews the archives and works (1969–1990) of the Chilean artist, Gonzalo Mezza (1949–), a pioneer of media art. For sixty years, his innovative work has been focused on the implementation of media technologies in Chile. He has stood out for critically modifying the visual language, through video art, performance, installation, Polaroid photography, photocopy and the use of computers, among others, being one of the first to carry out this type of practice in Chile and beyond. His poetic approach to the landscape, his reformist reading of art history, photographic exploration and multimedia installation, among other topics, led him to consolidate a body of work that opens complex readings about ecology, geopolitics, spirituality and media culture. This exhibition highlights how documents and works are now combined in a conceptual proposal that configures a retroactive archive, as input for the artist himself. *Mezza: Archivo Liberado* reviews, in the eyes of a media art pioneer, the initial processes of technological implementation in Chilean art. By a selection of documents and works, the exhibition offers a revisionist view, presented as an exercise in media archeology, exploring one's own history (of middle age) under different layers through a body of work that progressively models and anticipates important conflicts of today's society.

Curator: Sebastian Vidal Valenzuela
Project financed by the Chile's National Fund for the Arts (Fondart 2018), Ministry of Culture, Arts, and Heritage of Chile
New Media Area, Ministry of Culture, Arts, and Heritage of Chile
Ministry of Foreign Affairs of Chile, Foreign Office Board of Cultural Affairs (DIRAC),
Ars Electronica Festival 2019
Art Gallery D21 Proyectos de Arte
Center for Art Studies, CEdA Foundation
Alberto Hurtado University
Special thanks to Simón Pérez Wilson, Pedro Montes, Sergio Parra, Fernando Pérez Villalón, and Mariairis Flores

Mezza archivo liberado, 1970 — 1987

Stadtwerkstatt (AT)

STWST48x5 STAY UNFINISHED

48 Hours New Art Contexts. Totally Ready.

Founded as an artists' collective forty years ago, in 1979, Stadtwerkstatt (STWST) — a living and striving cultural space — takes pride in its autonomous structure. In 2019, STWST48x5 STAY UNFINISHED, the 5th edition of its 48-hour showcase extravaganza, brings together critical producers and artists to negotiate permanently unfinished conditions.

STWST48x5 STAY UNFINISHED presents the following array of programming:
STWST New Art Contexts: SANDHOLE by Franz Xaver, accompanied by Heike Kaltenbrunner; DEEP DRILLING FOR CONTRACTS, by Tanja Brandmayr; ml-iso|la|tion|ism by taro; GIBLING LUCIFERENSIS by taro and Eva Grün; CRYPTOBORDERS and ŦɏŁɨⱣ₫ (ŦŁⱣ) by Michael Aschauer; the hydroponic construct NOTNOPONTON by Jakob Breitwieser. The ongoing Mycelium Network Society will host an MNS SUMMIT to further recruit the nodes. Through open call and invitations: SOYBEAN FUTURES by Dimension Plus; TELEAGRICULTURE by Julian Stadon; CIVIL WILDERNESS by Claudia Reiche and Helene von Oldenburg; with the APRIORI group, Berlin's RAUMERWEITERUNGSHALLE association and Darko Fritz resurrecting I_AM_STILL_ALIVE. HTML (2009) to remind us about the unfinished internet error messages. Highlighting the unfinished archive of Stadtwerkstatt's 40-year celebration, there will be two nights of UNFINISHED CLUB under the titles of TALK RE:TALK and ACT RE:ACT, each of which will include five sessions and demand the public to stay awake from sunset to sunrise in Linz. UNFINISHED LIST brings together five existing mailing lists (nettime, crumb, faces, -empyre-, spectre) live on radio FRO. Years of mailing lists' open archives will be further processed and composted by Shu Lea Cheang's COMPOSTING THE NET performance. STWST48x5 STAY UNFINISHED programs remain unfinished as we welcome friends old and new, revisit dated and current media, take up unfinished workshops, unfinished kitchens, unfinished social projects to engage in public dialogue and debates, in the hope that these will add new layers to PREVIOUS LAYERS.

Plakatsujets STWST48x5, Design/AD: ortnerschinko.com

UNFINISHED CLUB

Conceived and realized by Shu Lea Cheang

Taking over the club space at STWST, the UNFINISHED CLUB will be hosting two all-night public events. TALK RE:TALK will be held from 19:35 (sunset of Friday, September 6, Linz) to 06:28 (sunrise of Saturday, September 7, Linz), and include five sessions: Unfinished Business (led by Franz Xaver on existence tactics and alliance binding); Unfinished Code (led by Winnie Soon on queering, speaking and vocable code); Unfinished Lab (led by Pedro Soler on labs for worldmaking, mutant breeding and revelation); Unfinished Network (led by Servus.at on the power, lacks and deviances of networking) and Unfinished Body (led by Quimera Rosa on self-experimentation and the trans* process). RE:TALK patching will be led by Martin Howse to intervene and re-version the TALK sessions. ACT RE:ACT will held from 19:32 (sunset of Saturday, September 7, Linz) to 6:29 (sunrise of Sunday, September 8, Linz) will include five sessions: Unfinished Archives (led by Thomas Lehner, STWST 40 Years); Unfinished Access (led by Laura McGough, reviewing artists and public access television from 1972—1994); Unfinished Utopia (where sci-fi fantasia will be meeting the real, existing utopia); Unfinished Porn (led by Jürgen Brüning, on the power of porn) and Unfinished Dream (led by Fabi Borges and Rafael Frazao,who will guide the construction of a work of speculative fiction). Ending the sessions with playback at dawn, we will walk out of the club to greet sunrise by the Danube, not-quite-finished.

Unfinished Coding by Winnie Soon,
Photo: Winnie Soon

Fisting Club at Unfinished Porn, curated by
Jürgen Brüning, Photo: Shu Lea Cheang

Sgraffito Alchemia, 1980, Photo: Rainer Zendron

Automaten TV — Ars Electronica 89, 1989,
Photo: Franz Xaver, © Bildrecht.at

Clickscape 98 — Ars Electronica 98, 1998,
Photo: Norbert Artner, © Bildrecht.at

UNFINISHED ARCHIVE celebrates the 40 years of Stadtwerkstatt

Conceived and realized by STWST

Forty years after the founding of STWST, the time has come to think about history and archives. Digital storage brought us the first “sampled” seconds in electronic media, a possibility that would impact the entire cultural development of the age. Since 1979, the artists of Stadtwerkstatt have been working across borders and linking all things crosswise; something reflected in the self-referential, interactive television shows the collective exhibited under the title of STWST-TV at Ars Electronica since 1987. With these shows, the state of “push media” was critically questioned, and STWST foresaw the social media of our time in its early pursuit of digital internet pull media.
From the mid-nineties onwards, two independent media associations, Radio Fro and servus.at, came out of STWST and remain active in it. With an increasingly critical attitude towards the Internet, STWST proclaims “art after the new media” as its initiative in new art contexts. In the fifth edition of STWST48, the focus was on history and its ability to mediate new positions: the graffito of the old house façade is projected onto the façade of current STWST building; Captain Mnemo, Leo Findeisen and Agnes Blaha host regular LIVE TV shows reconstructing these media perspectives with guests of Ponton/Van-Gogh-TV and Radio Subcom/Stubnitz; Thomas Lehner re-scans the STWST-TV shows, and Laura McGough recounts artists and public access television “making a scene“ in the United States from 1972 to 1994.

UNFINISHED LIST

Conceived and realized by Shu Lea Cheang

Triggered by a nettime posting (Date: Friday, June 07, 2019 10:41 AM) from the nettime mod squad, “subject: <nettime> Nettime is in bad shape. Let’s see if we can change it”), UNFINISHED LIST brings five existing mailing lists together for LIVE ON RADIO. The text-based email list-servs with their subscribed members are online platforms that grow media communities through information, discussions and debates. Nettime, a mailing list for networked cultures, politics and tactics since 1995, is moderated by Ted Byfield and Felix Stalder; the crumb new media curating mailing list aims to help those who ‘exhibit’ new media art, including curators, technicians and artists since 2000, and is moderated by Beryl Graham and Sarah Cook; Faces, a mailing list on gender, technology and art since 1997, is moderated by Valie Djordjević, Diana McCarty, Kathy Rae Huffman and Ushi Reiter; -empyre- has been facilitating online discussion with a critical perspectives since 2002, and is moderated by Renate Ferro and Tim Murray; spectre, which started by mailing on media art and culture in Deep Europe, has provided a channel for old and new media to meet across borders since 2001, under the moderation of Inke Arns and Andreas Broeckmann. Hosted by Radio Fro (http://fro.at), housed at the STWST and conducted by the lists’ own moderators, with the special moderation of Elena Robles Mateo for Faces and Geert Lovink for Spectre, the five-hour, non-stop radio streams (from 12:00—17:00, on Sunday, September 8) invite the global public to listen in and participate with speaking voices in live broadcast. At the close of STAY UNFINISHED’s 48 hours, Shu Lea Cheang will perform Composting the Net (2013, http://compostingthenet.net), to process the open archives of the mailing lists and compost the legacy of our networked culture in the hope to generate fresh sprouts, ever unfinished.

Composting the Net, Photo: Shu Lea Cheang

▽

SAND HOLE is an INFOLAB project of STWST New Art Contexts

By Franz Xaver

A concave sandhole with a 12-meter diameter is being dug in front of Stadtwerkstatt. This hole bundles the hydrogen radiation of the universe, through which we receive a signal we will call "NegInformation".

Franz Xaver asks what information is. To answer this question, a 12-meter sandhole is being dug at STWST48x5 to capture hydrogen radiation from various stages of the universe's development. We can receive pasts from the present of up to 10 million light-years at once, in a meaningless signal we call "NegInformation". The "NegInformation" stands for the human component in the new logical world order information theory brought us. "NegInformation" thus opposes the concept of NegEntropy that Erwin Schrödinger first formulated over 100 years ago, where he countered life to entropy. Claude Shannon subsequently introduced an information theory in which information is only transported from one place to another as efficiently as possible.
This is a theory of information transmission which above all serves economic market advantages, even as it fails to deal with what the "essence of information" might be. "In the beginning was hydrogen": with this view, our structure offers the possibility of perceive information in its earliest stage of development.

▽

DEEP DRILLING FOR CONTRACTS is a Quasikunst project of STWST New Art Contexts

By Tanja Brandmayr

Quasikunst has been conducting systemic-performative art research for several years. Depending on the project, it calls out coordinates, increasing and performing contradictions. In 2019, and under the title "Deep Drilling for Contracts", Quasikunst will dig down a sound hole in the basement of STWST. Underground: The knocking out of power/BUSINESS from nature is a core competence of our early industrial/CULTURAL history. Twelve seconds of metallic hammering as the looped sound-essence of an early ring mythology negotiating the transition from pre-modern to the modern in the late 19th century. First, dig down and knock ore out of the mountain; then, use technological voodoo to forge a ring, to be followed by contracts and capital. Even at the onset everyone was unhappy. The contracts expired. Many years later, business is at a turning point. Exploitation continues as ever. And we just keep digging down, deep drilling for NEW Contracts.

stwst48x5.stwst.at

Bau einer Schablone für eine 33 m Reflektorantenne, 1996, Photo: Joachim Baur

Quasikunst 2019, Photo: Tanja Brandmayr

IDPW (JP), Sofia Braga (AT)

The Internet Yami-Ichi

Shut down your computer and join the second edition of *The Internet Yami-Ichi* in Linz! *The Internet Yami-Ichi*, from the Japanese "Internet Black Market," but also "sickness" and "addiction," is a flea market where people consumed by the Internet can share and buy Internet-related things in real life.
The Internet Yami-Ichi was created by the Japanese art collective IDPW in 2012, and took place in Tokyo for the first time. Since then many editions have been organized in various cities like New York, Seoul, Moscow, Berlin and more.

This project is supported by Ars Electronica and Interface Cultures
Curated by Sofia Braga
Official website: *http://yami-ichi.biz/*

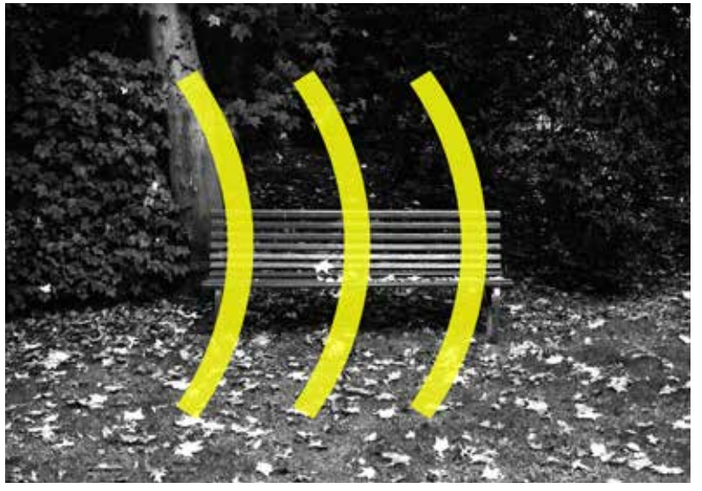
BIO AUSTRIA (AT)

BIO AUSTRIA Bauernmarkt: All organic. All reliable. All regional.

In a nutshell, these are the characteristics of the organic foods produced by our BIO AUSTRIA farmers. They are convinced that they fulfill higher requirements than the law prescribes, which means more animal welfare, more environmental and climate protection and more biodiversity. The special quality of BIO AUSTRIA food is guaranteed by strict quality assurance from the field to the shelf. If the organic food comes from the region, it meets the gold standard of the food sector. On September 7th the farmers of BIO AUSTRIA will present their unique regional products. Visitors to the festival can try, taste, and enjoy the organic food and talk to the producers. Information about organic farming and how organic farmers benefit our climate and environment round off the BIO AUSTRIA farmers' market.

It wasn't only the Ars Electronica Festival that kicked off 40 years ago — the Association of Organic Farmers, a forerunner of BIO AUSTRIA, was founded at the same time. Pioneers of organic agriculture joined forces to exchange experiences and promote the development of organic agriculture in Austria. 40 years later, organic farming is a success story with a promising future, which is still actively shaped by the association BIO AUSTRIA and its member farms. BIO AUSTRIA is the network of Austrian organic farmers. As the largest organic association in Europe, BIO AUSTRIA represents Austrian organic agriculture and the interests of organic farmers — with 13,500 members and more than 400 partner companies in the economy. Further information can be found at *www.bio-austria.at*

Bio Ernte



Hörstadt — Anatol Bogendorfer (AT), Peter Androsch (AT)

Monophon yello)))

The *Monophon yello)))* is the most recent work from a series of ear trumpets that the Linz collective Hörstadt has produced since its foundation 10 years ago. *Monophon yello)))* concentrates on a context that is as fundamental as it is essential for many Hörstadt projects: public space is always acoustic space. It can be designed acoustically on the basis of all the set pieces. Noise is not the central theme here, but sound as an important resource for people (for communication, orientation, information, articulation, participation, etc.). Political will to create and creative performance are often reflected in the acoustic space. According to Hörstadt, this is only the beginning for all the new possibilities (intellectual and technical) in communities, spatial and urban planning. Peter Androsch and Anatol Bogendorfer often choose artistic means to express their perception of acoustic space. In doing so, they always put hearing (and not the production of sound) first in their aesthetic debate.

Design: Anatol Bogendorfer
Team Hörstadt: Peter Androsch, Anatol Bogendorfer, Leo Saftic, Margit Knipp
Contributors: Stefan Füreder, Tabea Cray

Domas Schwarz

Raumteiler Linz Kulturverein — Amanda Augustin (AT), Lorena Höllrigl (AT)

Holy Hydra

Intergalactic Symposium | Music | Performance in a Church

Holy Hydra is a two-day event offering contemporary performances, electronic sound art, interactive light installations and a symposium about “Sacral Space = Urban Space” in the parish church of Urfahr, next to the Ars Electronica Maindeck. Its main concern is to present different artistic disciplines in this unique spiritual atmosphere, so as to offer an experience that can be enjoyed by everyone regardless of their religious convictions or beliefs. The project is intended to extend or rethink the useage of architecturally and historically valuable structures. Churches fulfill those characteristics perfectly, and are exemplary when used for alternative purposes.

Concept & Production: Amanda Augustin (AT) & Lorena Höllrigl (AT)
Production Team: Raumteiler Linz (AT)
Music partly curated by: Peter Lindorfer (B.Ranks / BLVZE) (AT)
Visual Concept: 4youreye — ProjectionArt (AT)
The project is supported by Grüner Anker — Jugendkirche der Diözese Linz und Kirche am Fluss — Stadtpfarrkirche Urfahr
www.holyhydra.at

Nadine Arbeiter (DE), Cordula Ditz (DE), Daniel Egg (AT), Dan Farrimond (UK), Juha van Ingen (FI), Joey Holder (UK), Kathrin Günter (DE), Raquel Meyers (ES), Matthias Moos (CH), Niccolò Moronato (IT), Jarkko Räsänen (FI), Seppo Renvall (FI) and UBERMORGEN (AT/CH/USA)

“ORF TELETEXT meets art” and Teletext Hackathon

At the *Teletext Hackathon* in the POSTCITY, five of the participating artists will create live teletext art, and the public is also cordially invited to get creative on site with teletext software. The resulting artworks can immediately be published and admired in ORF TELETEXT. The teletext exhibition *ORF TELETEXT meets art* will be shown in a presentation at Deep Space 8K.
Teletext was originally launched by the BBC in 1974 (known as Ceefax), ORF and ARD started to offer Teletext in 1980; technically it is almost unchanged since then. A teletext page can be perceived as a grid of 24 rows and 40 columns. Each part of the grid can be used for a letter, a number, a special character, a control character or up to six graphic pixels. To change the colors of the graphics, text and background or to add a blink effect, a control character needs to be inserted. Each time a control character is placed it uses up one space in the grid, which then appears black. And you only have six colors, black, and white. The success of the teletext medium, which has also been available on the Internet and as an app for many years, is due, among other things, to its simplicity of use, its high technical distribution and, of course, its actual content.

ORF TELETEXT trifft Kunst
29.9.2019 — 19.9.2019
ORF TELETEXT (from page 840)
ARD Text (from page 800)
www.teletextart.com
Cooperation: ORF, ARD and the artists’ cooperative FixC

YAIR — Your Art is Reality

YAIR seeks to preserve digital cultural heritage, standardize ownership and provide free public access to digital artworks. From video & photography to VR & AR, YAIR is working across all digital media, building a secure, convenient, standardized and tokenized ecosystem for the digital arts on a blockchain infrastructure. To do this, *YAIR* is establishing a foundation with a community of experts in the field of contemporary art. Through it, artists, collectors and institutions can join forces to build a platform that will pave the way for a new generation of digital artists. The *YAIR* foundation will actively promote new media arts via exhibitions and PR to support international digital artists in sharing their work and to engage with the latest tech, enabling them to truly unleash the power of the digital arts.
YAIR is creating new ownership models for collectors by using blockchain to sell participation rights (via tokens) for an emerging economy of artwork IP licensing. A new form of art collecting in the digital era is about to be unleashed.

Directors: Leonardo Lüpertz, Anna Jill Lüpertz
Curator: Hong Yu
Owners: Leonardo Lüpertz, Florian Braeunig

Wu Juehui (CN)

bitTOWER

bitTOWER is inspired by the *ouroboros*, one in which every element of the installation acts serves as a visual metaphor for something. The scaffold matrix creates a space with a limited mass, as though the epidermis of the excessively expanding city had been torn apart, exposing its internal organs. The cycle of lights acts as a moon and sun, with shadows of mottled steel pipes expanding the borders of the matrix. The interplay of lights and projected digital images creates a virtual world that's swiftly shifting between night and day. The spiral cases inside the matrix overlap and, just like the *ouroboros*, begins where it also ends. The immersive environment opens a wormhole into another dimension for the audience, with the synesthetic ceremony leading to a sense of reverie.
Experiments in different-dimensional spaces are crucial to the future development of art and technological advances leading to the ability to reach greater depths in exploration. In order to do this, the co-evolution of art and technology — their close, mutual contact and mutual restraint —, is necessary to open a new dimension for space between destruction and growth. *bitTOWER* acts as an art spell in that it attempts to explore these different dimensional spaces. It is an access code, partway between reincarnation, renascence, borderlessness, boundedness, and even the informational world and the universe.

Today Art Museum

bitTOWER, 2019, Wu Juehui (CN)

Robert Montgomery (UK)

Estuary Poem for Wyndham Lewis

A memorial fire-poem to Wyndham Lewis at the point in which the River Thames, having left London, meets the North Sea. This work is both a ceremonial elegy to Lewis (an important figure in British Modernism and the editor of the concrete poetry journal BLAST) and an updating of his phrase "Enemies of the Stars" for the age of ecological crisis. It seems that we have now all become the enemies of the icebergs and the stars...

Courtesy Robert Montgomery Studio

Estuary Poem for Wyndham Lewis, 2017,
Robert Montgomery (UK)

Maria Marshall (UK)

The Hudson

Men in suits and ties carrying briefcases appear on the Hudson River and walk onto the beach and beyond the frame. Their clothes are wet. The same men appear with dry clothes and walk out of frame. The soundtrack is of a Trump speech about putting up the wall, sped-up to sound like Mickey Mouse. The soundtrack: Three of the same soundtracks are played at different intervals so that there will be a cacophony of sound, but audible wherever the viewer stands.

Director/Artist: Maria Marshall
DOP and actor: Andrew Oberstadt

The Hudson, 2018, Maria Marshall (UK)

▽

Yan Lei (CN)

Rêverie Reset

Rêverie Reset is a system that expands on Yan Lei's practice of dissolving images into concepts. The video installation makes use of cutting-edge computational systems and networking technologies in order to reaffirm the artist's notion of the artificiality of representation and the irrelevance of the image. Each of the sixteen displays is networked into a system programmed to constantly show images submitted by the audience through their phones and from a local database. Every time an image is uploaded, the software processes it by calculating its average pixel color, while the local, artificial neural network describes it textually, in human-like terms.
Lei constantly probes into the image's cultural relevance by recursively questioning what is implicit in its act of representation whilst emphasizing its superfluous nature. One could refer to Yan Lei's creative process as a destructive practice that is closest to conceptualism; in which layers of ideas are superimposed over visual expression in an action that reduces realistic representations into abstract monochromes.

北京技艺云文化有限公司 Beijing jishu&Art Culture Co., Ltd.

▽

Julius von Bismarck (DE)

Calle 22

Calle 22 is Julius von Bismarck's documentation of the street of the same name in Bogotá, Colombia. With a high-speed camera and a spotlight, he shoots over 2500 frames per second during a high-speed car along its south side at night. This takes him from the prosperous parts of town to its poor quarters, allowing him to present urban development in a very compressed space, and to reflect on the city's political process by travellikng down a single road. He questions the outside gaze on the social strata of another country by capturing images of it in slow motion that seem to show an almost frozen scenery. Since the camera captures the street in one, continuous tracking shot, there is no possibility for selection. Von Bismarck alludes to Western photography in poorer countries as having become trained to trigger certain emotions or reactions in the viewer by selecting its motifs. His spotlight produces an aggressive interference in the private lives of locals, as is often the case with Western reports of other cultures. With a fast drive and a spotlight, individual scenes are placed in focus and the people of Bogotá are portrayed as if by accident, because until they have realized the moment of the shot, the camera is already ahead.

Rêverie Reset, Yan Lei (CN)

Calle 22, 2015, Julius von Bismarck (DE)

Kathrin Stumreich (AT)

hosted by Ars Electronica

In the scope of this year's Ars Electronica Festival 2019, Bildraum 07 in Vienna presents current works by Kathrin Stumreich. The artist gives insights into her sound research, in which she examines order and code, movement choreography and complex robotics, as well as coincidence and chaos as material properties. The multi-award winning flag installation "Sovereignty" and Stumreich's video-based work "Code Talk" illustrate the intrusive potential and ubiquity of technological dispositives and make encrypted information accessible with the "sound" of the latest technology.

Bildraum 07, Burggasse 7-9, Vienna 1070
Tue-Fri: 13 — 18 pm
www.bildrecht.at
A cooperation of Bildrecht and
Ars Electronic Festival 2019

arebyte Gallery

arebyte Gallery is a London-based art organization which supports the development of artists working across digital and emerging artforms. Following in the long tradition of artists experimenting with new technologies, *arebyte Gallery* has led a pioneering program since 2013, to much acclaim. From web-based work to multimedia installations including Virtual and Augmented Reality, Artificial Intelligence, Computer Generated Images and 3D printing, the gallery commissions new works from emerging, as well as more established artists. The gallery supports multiple voices in digital cultures across the UK and internationally to bring innovative perspectives to art through new technologies. Registered as a charity and operating as a studio provider throughout London, arebyte channels its rental income into its arts program to deliver a series of exhibitions and online projects, with the support of additional private and public funders.
At the forefront of today's digital art scene, *arebyte Gallery* offers an inspiring place to explore emerging media art with an interdisciplinary approach at the intersection of art, new technologies, and social sciences. Through a public engagement program nurturing creative and digital skills, the gallery fosters a young and inclusive art community that reflects the diversity across Tower Hamlets, Newham and Greenwich.

Directors: Nimrod Vardi (Founding and Creative Director), Claudel Goy (Managing Director)

Mark Farid (UK)

Seeing I

Performance, Video, Conceptual

For 24 hours a day, for 28 days, artist Mark Farid will wear a virtual reality headset, seeing and hearing what one person sees and hears for 28 days. *Seeing I* will confine Farid to a gallery space in London, subjected to the simulated life of the project's Other. With no pre-knowledge of, or existing relationship to the Other, the only details confirmed to Farid will be that the Other is in a relationship and at least eighteen years of age. For the duration of the project's 28 days, Farid will experience no human interaction relative to his own life, allowing his indirect relationship with the Other to become Farid's leading narrative. Will the constant stream of artificial sights and sounds start to displace his own internal monologue? How many days will it take to alter Farid's movement, mannerisms, memory or rationale? Without free will to determine who he is, will Farid's consciousness be enough to deter significant changes? At Ars Electronica we will be doing our final trial run in the build up to the 28-day performance in 2020. This residency will see Farid wear a VR headset for seven days. Finally, a public conversation between Farid and the project's Clinical Psychologist, Dr. Tamara Russell will be held.

Seeing I, Mark Farid (UK)

Seeing I is commissioned by arebyte Gallery, London, in partnership with the Sundance Institute, the Mindfulness Centre of Excellence, and Imagine Science Film Festival. Photos: Sophie le Roux, and Seeing I. Artist, Producer and Subject: Mark Farid. Funder and Co-Producer: Nimrod Vardi. Development of the custom built recorder: Tadej Vindis (System Design and Project Management), Frank Davies (System Design and Software Development), Drew Richards (Product Design). Clinical Psychologist: Dr. Tamara Russell Biometric Research: Carl Smith, Mark Ransom. Documentary Maker: Petri Luukkainen.

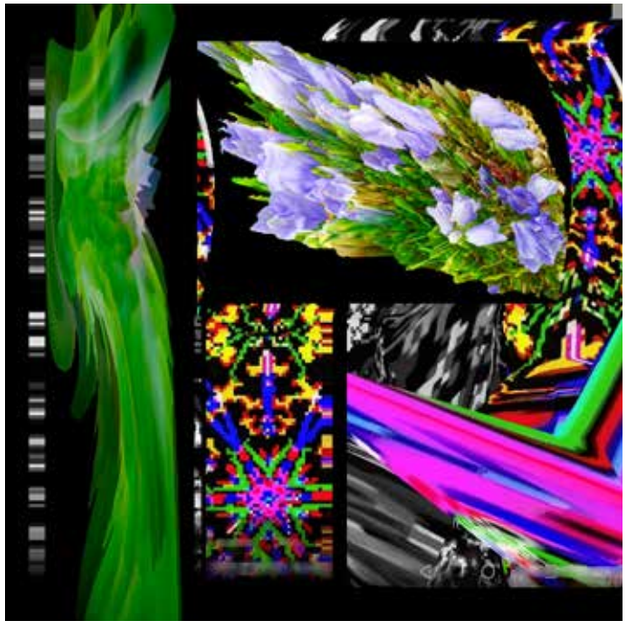
STATION ROSE (AT)

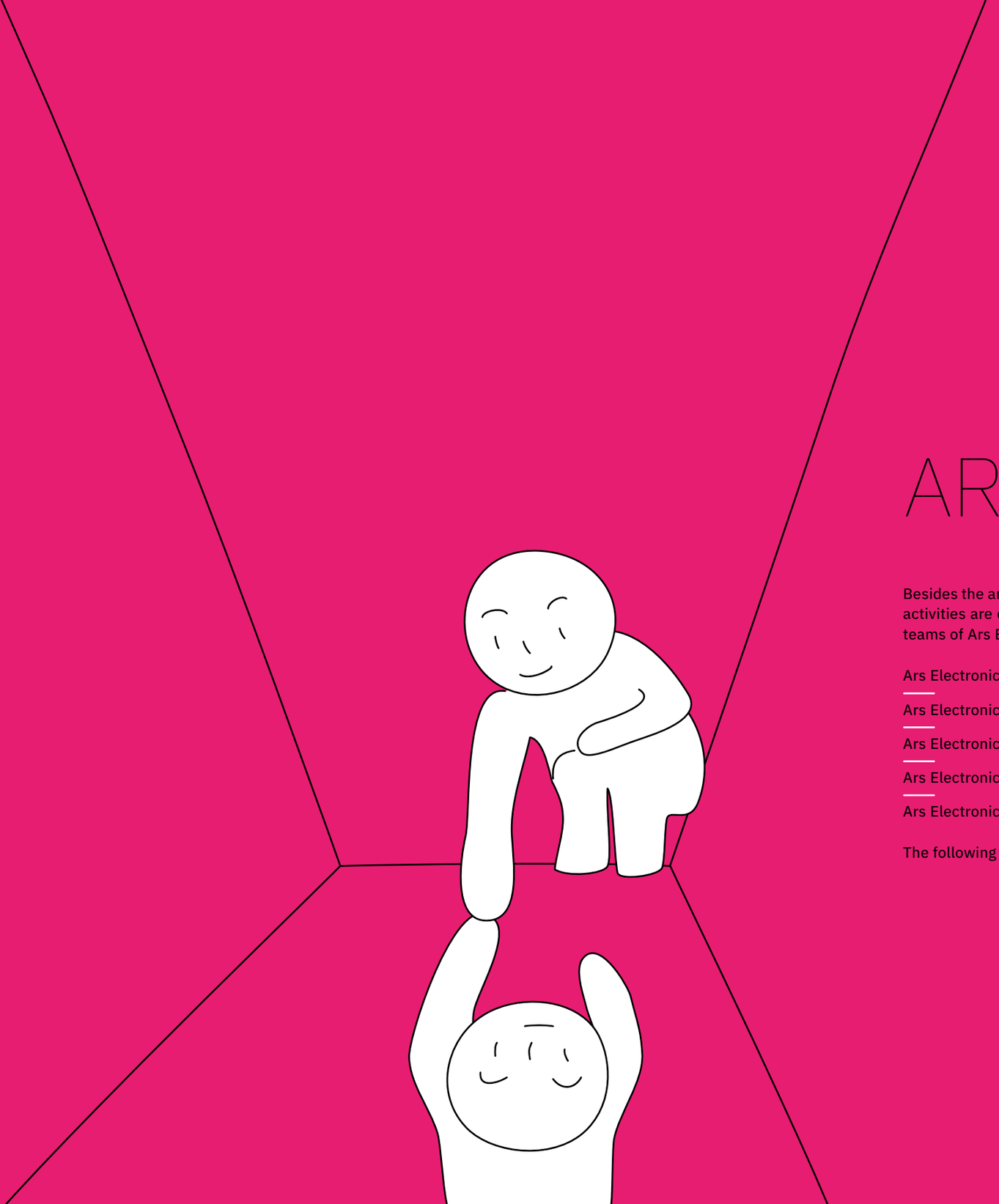
U >< N<>I<<T>> A

#Urbana Natura in_hancing_The_Augmented

#Urbana Natura in_hancing_The_Augmented & vice versa is an augmented audio-visual installation, an "Out of Nature into Urban Augmented Space & Back again" exhibition.
The ensemble of nature, urban and augmented spaces shows the already existing deep interweaving of these seemingly independent levels and forms of life.
The augmented installation is created with various materials in the real exhibition space of the Hofkabinett Gallery. Patterns have been essential in the digital STATION ROSE (STR) image and sound language since 1988. Patterns from 1988-2019 are used in *U >< N<>I<<<T>> A*. Nature also appears as patterns, urban plants are fed into the microscope by Elisa Rose. Nature has long played an important role and its integration into urban space is extremely necessary. STR has coined the terms "Digital Land Art," "Urban Digital Land Art" and "Nature Is Cool/ NiC." Gary Danner's electronic music reflects his decades of involvement with subcultural and serious music.The virtual augmentation (Artivive App) creates another space — *U >< N<>I<<T>> A*.

stationrose.com





ARS ELECTRONICA

Besides the annual Festival and the Prix Ars Electronica numerous projects and activities are conducted throughout the year by the different departments and teams of Ars Electronica.

Ars Electronica Center

Ars Electronica Futurelab

Ars Electronica Solutions

Ars Electronica Export

Ars Electronica Japan

The following part gives a brief overview of these activities since last year.

ARS ELECTRONICA CENTER

Museum of the Future

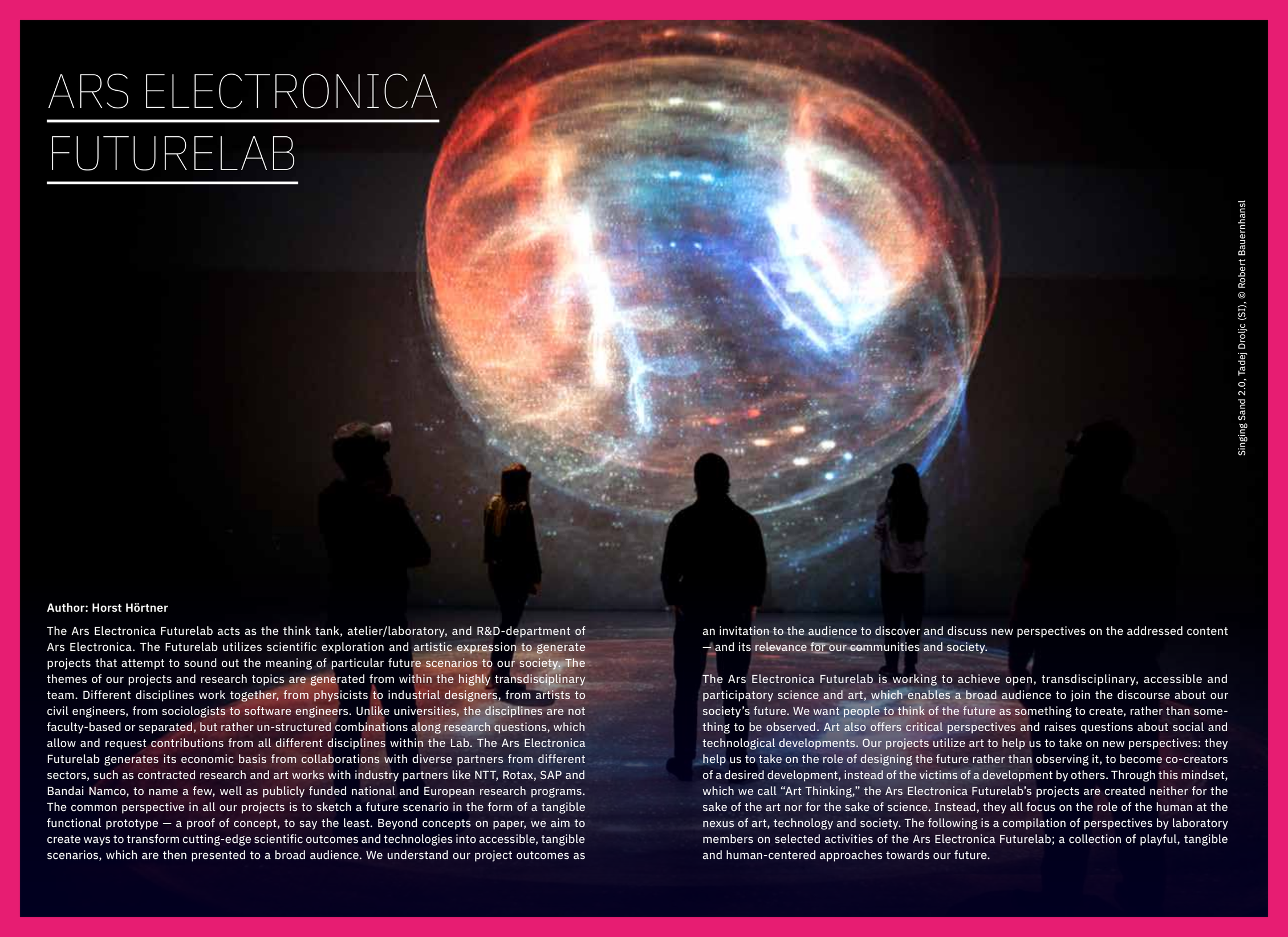
Robert Bauernhansl

Compass — Navigating the Future

The new Ars Electronica Center

On September 18, 1979, the very first small but groundbreaking “Festival for Art, Technology and Society” began in Linz. Today, four decades later, Ars Electronica is one of the world’s largest and most important platforms for media art, ideas for the future and innovation — and in demand as never before. The Ars Electronica Center opened as an important milestone in 1996. As a year-round platform for presentation and creation, the *Museum of the Future* quickly became an integral part of Linz’s cityscape and life. In the run-up to *Linz European Capital of Culture*, the then two-story building was expanded to its current size, including new, large exhibition areas in the basement and an interactive media façade, and reopened on January 1, 2009. Almost exactly 10 years later, the Ars Electronica Center is reinventing itself! The Ars Electronica Center has transformed itself from a telescope that opens up a glimpse of the future into a compass and companion through the man-made systems of the 21st century. New exhibitions, new laboratories, new communication formats, a new self-image — with *Compass — Navigating the Future*, the Ars Electronica Center in Linz opens its next chapter. It offers a wealth of interactive scenarios, artistic works, scientific research projects, info stations, workshops and laboratories, all of which revolve around current developments in the fields of artificial intelligence, neuroscience, neuro-bionics, robotics, prosthetics, autonomous mobility, genetic engineering and biotechnology. Due to the comprehensive redesign of the Ars Electronica Center this year, we are publishing an extra volume, which gives an extended overview of the different sections in the museum.

ARS ELECTRONICA FUTURELAB



Singing Sand 2.0, Tadej Droljc (SI), © Robert Bauernhansl

Author: Horst Hörtner

The Ars Electronica Futurelab acts as the think tank, atelier/laboratory, and R&D-department of Ars Electronica. The Futurelab utilizes scientific exploration and artistic expression to generate projects that attempt to sound out the meaning of particular future scenarios to our society. The themes of our projects and research topics are generated from within the highly transdisciplinary team. Different disciplines work together, from physicists to industrial designers, from artists to civil engineers, from sociologists to software engineers. Unlike universities, the disciplines are not faculty-based or separated, but rather un-structured combinations along research questions, which allow and request contributions from all different disciplines within the Lab. The Ars Electronica Futurelab generates its economic basis from collaborations with diverse partners from different sectors, such as contracted research and art works with industry partners like NTT, Rotax, SAP and Bandai Namco, to name a few, well as publicly funded national and European research programs. The common perspective in all our projects is to sketch a future scenario in the form of a tangible functional prototype — a proof of concept, to say the least. Beyond concepts on paper, we aim to create ways to transform cutting-edge scientific outcomes and technologies into accessible, tangible scenarios, which are then presented to a broad audience. We understand our project outcomes as an invitation to the audience to discover and discuss new perspectives on the addressed content — and its relevance for our communities and society.

The Ars Electronica Futurelab is working to achieve open, transdisciplinary, accessible and participatory science and art, which enables a broad audience to join the discourse about our society's future. We want people to think of the future as something to create, rather than something to be observed. Art also offers critical perspectives and raises questions about social and technological developments. Our projects utilize art to help us to take on new perspectives: they help us to take on the role of designing the future rather than observing it, to become co-creators of a desired development, instead of the victims of a development by others. Through this mindset, which we call "Art Thinking," the Ars Electronica Futurelab's projects are created neither for the sake of the art nor for the sake of science. Instead, they all focus on the role of the human at the nexus of art, technology and society. The following is a compilation of perspectives by laboratory members on selected activities of the Ars Electronica Futurelab; a collection of playful, tangible and human-centered approaches towards our future.

Author: Maria Pfeifer

Future-oriented thinking and action strategies for the world of tomorrow

"The inability to imagine a world in which things are different is evidence only of poor imagination, not of the impossibility of change"
Rutger Bregman, 2017

In today's knowledge society, future-oriented thinking is a central resource. But how do we imagine a desirable future? Change happens all the time, but how can we steer change? Part of the Ars Electronica Futurelab dedicates itself to designing future-oriented action strategies on a discursive level, aiming to empower individuals and society to perceive themselves as capable of action in this increasingly complex world.

The key lies in creating tangible and accessible future visions that can be developed and shared with stakeholders in order to kick-start a discussion. Whether it be research studies or sketches, future scenarios or workshops, the inclusion of artistic strategies (Art Thinking) always plays an essential role in the process. Art acts as an agent of change, on the one hand it offers a fine sensorium for relevant social developments and technological applications beyond superficial trends, on the other hand art is a communicator for perspective shifts and inspiration. The combination of discursive strategies and artistic vision has the potential to design alternative futures — and make them tangible in the present.

Artistic strategies enable participants to see speculative futures turned into hands-on experiments, to sharpen their sense of possibility, to evaluate future developments, to stimulate reflection, to be inspired, and to look for solutions off the beaten track. They are a powerful tool for changing perspectives on the supposedly self-evident — on an intellectual, emotional, and aesthetic level. This is why discussion formats like the Innovation Lab, staged together with the Upper Austrian Economic Chamber in April 2018 on the subject of innovation in the construction industry, or the Digital Skills Camp, developed together with the Ars Electronica Center in 2019 in order to familiarize companies and individuals with cutting-edge technologies like Artificial Intelligence or Blockchain, also draw on examples from the art world. Input lectures by Ars Electronica Futurelab experts, practical application examples, as well as dilemma discussions complete the workshop programs, recontextualizing developments of our time and mapping their possible trajectories into the future.

In a similar fashion, the 2019 Expert Study commissioned by KFV "Jobs of the Future in an Automated Mobility Environment" coalesces humanities research with hands-on examples, contextualizing future developments and establishing conceptual links between trends, developments, and technologies. In four fictional future scenarios, over 60 different professions are imagined for the speculative future of 2050, delving deeply into questions of the future of the mobility and the logistics industries.

These alternative discourses help facilitate progress — a progress not understood as linear growth, but as freedom of movement. The resulting research is neither economically driven trend research nor classical business forecasting; trend analyses, future scenarios and visions are a byproduct.

Instead, the main focus lies on the potential social ramifications of future and present-day technologies — using art as a catalyst for discussion, exchange, and inspiration.

Photo: rawpixel, Illustrations: Ars Electronica Futurelab

Author: Ali Nikrang

Frozen Artificial Intelligence and Creativity

Understanding artificial neural networks in terms of creativity and interaction.

While the development of artificially intelligent systems has seen a surge of research interest and considerable advances in recent years, interaction between these systems and humans has remained, for the most part, one-sided. Once an artificial neural network has been trained with a given set of data, the weights and biases within the network cease to be constantly adjusted — the network lacks the plasticity typical for biological neural networks. Instead, it appears frozen in place. The resulting human-machine interaction is one between a continuously adapting living organism and a system that has learned a certain way of operating, but remains incapable of further (short-term) adjustment to ever-changing situations.

A series of in-house developments currently on display at the Ars Electronica Center approaches the issue from a didactic perspective, exploring the various methods of training an AI system with installations like *Neural Network Training* or *Comment AI*, or illustrating the operating principles of different AI systems (*ShadowGAN*, *Prix Space*). The installations reveal the mathematical backbone of AI, aiming to illuminate and demystify the technology.

The effort is justified: presumptions and expectations attached to artificially intelligent systems more often than not directly contradict the factual circumstances. For instance, the smallest adjustments in data input presented to an interactively used generative neural network system can trigger a seemingly endless variety of outputs, contributing to the impression that the artificially intelligent system reacts, acts, and interacts in a dynamic, creative and animated manner, regardless of the fact that a finished trained model always produces the same output given a certain input.

Algorithms like the one employed in *ShadowGAN* cannot evolve through interaction once they have been trained. Instead, it is us humans who act and react, who learn, who adjust, and who steer the interaction with objectives and intent.

What applies to human-machine interaction also holds true for creative production: Algorithms capable of generating texts or composing music might engage with domains that have traditionally required creative agency, but assembling strings of notes or words after having statistically processed a comprehensive set of data hardly compares to a human writing a novel or creating a composition. The crucial difference is intent — after all, literature is more than a combination of words, music is more than a set of musical notes. As is evident when listening to the AI-generated musical renditions in Ars Electronica's *AI x Music* exhibition or reading a piece of AI-composed writing, styles can be reproduced by machines.

However, the same could not be said for a literary motive, a musical objective or creative intent. Here, too, the intent remains with the human user. It is our brain that tries unconsciously to construct a meaningful mental overall representation of a composition or of a text generated by AI.

Considering these dissonances between perceived and actual behavior of AI, our expectations of AI in terms of creativity and interaction must be reconsidered. For the moment, neural network based AI systems are used as tools rather than counterparts. They can serve as a new source of inspiration for human creativity by opening up new perspectives and detecting connections in the data that human observers might have not been aware of. Even more, they can be helpful for deepening our understanding of our own creativity.

However, for more creative or/and interactive applications, new research has to be done.

Our research involves the interaction between human and AI systems with a focus on creative applications. On the one hand, we investigate creative outcomes of AI systems and how they can be led, enhanced and personalized through interaction with human users and, on the other hand, how interactive AI systems can be designed to best serve human creativity.

vog.photo

Author: Marianne Eisl

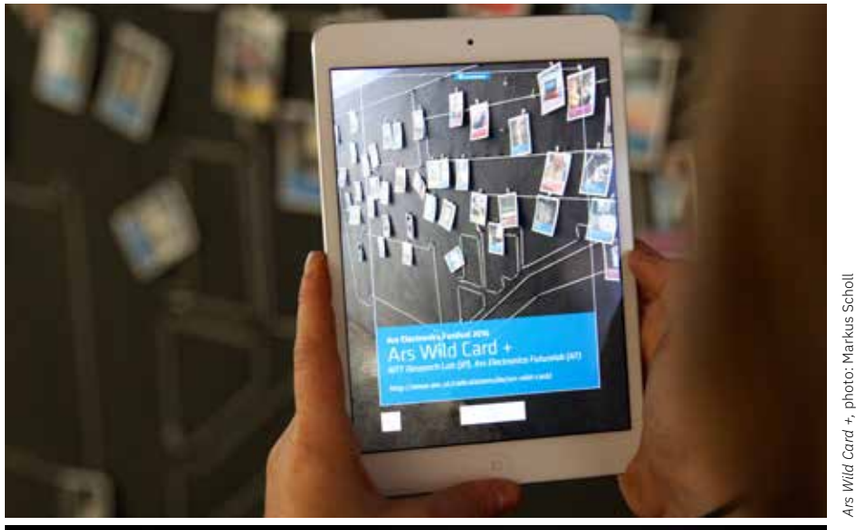
Beyond interaction — participation as key element for exhibition design

In this day and age, we expect participation and co-determination — not only in politics and society, but also as museum visitors. In this area of life, too, we want to be freed from our passive role and become active contributors and associates, create something lasting, get involved and become part of something bigger than ourselves. It is not only the visitors, but also museum work itself which profits from the fulfillment of this aspiration — opinions and viewpoints of citizens with their own personal expertise and experiences can offer a completely different approach to a given topic, thus lending a new depth to the contents shown in many respects. It is precisely this additional dimension that turns an exhibition, a lecture or an (interactive) exhibit into an immersive experience which touches the visitors emotionally and leaves a lasting impression.

The intensity of participation varies greatly, ranging from the mere contribution of personal data and values or the contribution and establishment of new perspectives to the co-creation of entire exhibition concepts. Participation could consist of simply providing one's heart rate and breathing volume to influence a visualization, as is the case at "The Universe Within" shown at Deep Space 8K, just as it could mean actively designing exhibition elements, as at a past Ars Electronica Festival, where visitors were invited to create postcards of the Festival area to share their perspective on the exhibition objects. In the exhibition "Gestures — Yesterday, Today, and the Day after Tomorrow," developed jointly by the Technical University of Chemnitz (Germany) and the Ars Electronica Futurelab and currently shown in the Museum for Communication in Berlin, visitors were even able to contribute to data sets used in gesture research using their own bodies, while at the same time finding themselves represented in the very exhibition they were visiting.

Scientifically speaking, all our activities concerning participation at the museum focus on application-oriented explorative research of new ways of participation, benefiting above all from a transdisciplinary approach. A second emphasis is placed on possible definitions of prerequisites for intuitive participatory formats, which offer an additional value for everybody involved.

This very question is the main focus of our current collaboration with the Natural History Museum in Vienna, in which we are working together to create a physical space for innovation and experimentation. The underlying research interest lies in how to develop inclusive strategies for integrating different social strata into research activities of the museum: in the new space, visitors of all backgrounds are invited to participate in social discourse through active engagement and new forms of participatory communication. By doing this, visitors are constantly redesigning the exhibition with their contributions and are at the same time part of the scientific process of the museum.



Ars Wild Card +, photo: Markus Scholl

Shadowgestures, photo: Michael Mayr

Author: Roland Haring

Co-Immersive Spaces — Co-located Multi-user Interaction in Large Screen Virtual Reality Environments

In recent years, most virtual reality research has focused on single user systems in the form of head-mounted displays. In some cases, combined with localization methods and wireless image transmission, a limited freedom for the user to move in space is achieved. Despite the enormous technological progress compared to earlier models, those systems still have inherent limitations by design that can hardly be overcome. Due to the fact that the user has to wear glasses that cover their field of sight, they are completely detached from the real spatial environment. Other users, sharing the same physical space (co-located), cannot be perceived and thus interaction with them or their representation in the visualization is hardly possible (co-presence). Virtually present persons, often visualized by avatars, have only a very rudimentary body representation and thus a limited social presence. Although there are some research prototypes trying to address this, practical applications are rare. All those systems are unsuitable for larger groups of users co-located in a shared space.

In that way, virtual reality research dissociates itself clearly from its own original visions, initially described by Ivan E. Sutherland in 1965 as the "The Ultimate Display" that later found its way into popular culture as the "Holodeck." Actually, topics relating to co-located multi-user VR systems have not lost relevance. Quite the contrary: all kinds of increasingly complex data requires extended visualizations and forms of interaction, in order to make it virtually understandable and tangible to groups of users in explorative settings. With the advances in VR projector technology, image generation and rendering (8K and beyond), it becomes necessary to establish a deep and broad understanding about the effective design and implementation of application scenarios building on these virtual reality systems.

In this exciting field, Deep Space is a pioneer environment of practical research. Since its opening in 2009, it has attracted more than 1 million visitors and has profoundly shown how VR spaces for multiple co-located users can not only be designed, but also successfully run. The VR experiences realized in Deep Space over the years are manifold. This includes, aside from the daily presentations and special programs, specific scenarios such as rapid prototyping of simulations, e.g. of autonomous mobility systems, research on human-robot interaction, dance and theatre performances, and, recently, medical education and training. However, similar infrastructures are still rare, also because a lot of specific know-how and experience is required to replicate them. Therefore, it is necessary to address the topic of immersion of user groups in projection-based, room-scale virtual reality systems on a more general level. Based on the models and mechanisms of perception and interaction discovered in this way, specific requirements for the design and the implementation of similar future environments can be derived.

Research indicates that besides the ability to interact (agency), spatial mapping (perspective) is the second core factor for the perception of immersion and presence in VR environments. But existing theories do not take co-located multi-user interactions into account when defining their models. Therefore, we propose the building of an extended model of "Co-Immersion."

Through the experience of creating many diverse applications for this space over the years, recurring design patterns have emerged. One factor identified is that even the perception of actively interacting users in a shared co-located VR space can create and intensify the feeling of one's own immersion. Another one is that users need to be able to intuitively verify and understand the agency they have in this space. Considering these and other factors, which still need to be identified and exposed in future research, the research will lay the foundation for formulating specific guidelines for the design of experiences, especially for the technical system requirements of a versatile, multi-functional and co-immersive environment.

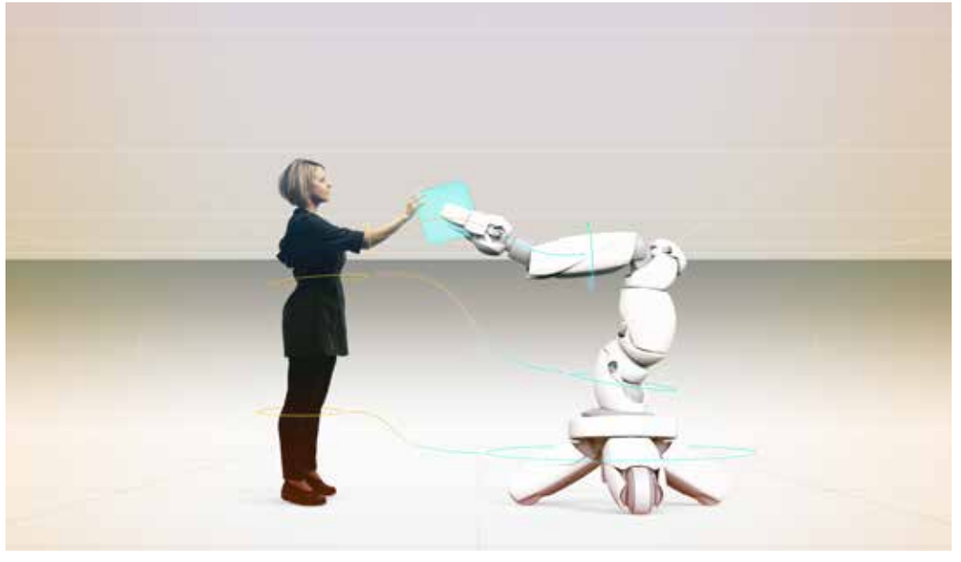
Earth and its magnetic field, Photo: Ars Electronica / Robert Bauernhansl

CoBot Studio

Crossing Realities for Mutual Understanding in Human-Robot Teams

In the future, collaborative robots (CoBots) will be used at more and more workplaces, working in close physical proximity to people and cooperating with them, e.g. assembling car seats together.
The project *CoBot Studio* aims at mutual understanding, predictability, trust and efficiency in the collaboration between humans and robots. The interdisciplinary project team is developing a novel mixed reality simulation environment in Deep Space 8K in which non-verbal communication signals are investigated. In interactive scenarios, robot signals, work tasks and environmental parameters can be varied in order to develop best practices for a safe and pleasant cooperation between humans and machines.

LIT Robopsychology Lab, JKU Linz (AT),
Ars Electronica Futurelab (AT),
Center for HCI, University of Salzburg (AT),
Joanneum Robotics (AT),
Polycular OG (AT),
Austrian Research Institute for Artificial Intelligence OFAI (AT), Blue Danube Robotics GmbH (AT)



Ars Electronica Futurelab

Vanessa Graf

Rotax MAX Dome

Ars Electronica Futurelab (AT), Rotax (AT), Polycular (AT)

The new *Rotax MAX Dome* combines innovative e-kart racing with digital technologies and gamification. Together with BRP Rotax, the Ars Electronica Futurelab has created a comprehensive racetrack experience, reaching beyond the physical race itself — video avatars of racers, achievement levels and playful scoreboards, a special wall of fame and the centerpiece, a large tunnel encompassing two floors in the middle of the racetrack, enhance the races. Within the tunnel, a variety of digital games let the racer add points to their final score by collecting coins, following a certain track or avoiding obstacles on the floor. Additionally, a team room, designed in cooperation with the Game Design Studio Polycular, provides the experience of an Escape the Room game, including a ride with the BRP Rotax e-karts.
The screens, displays, and added experiences form a closed system with a common aesthetic language across all applications, turning the racing experience at the Rotax MAX Dome into a fast-paced, cohesive and digitally extended adventure.

pinocchio, Photo: vog.photo

In the spotlight: Industrial Robots on stage

The industrial robot as a dancer, or even a dance partner. Industrial robots as puppeteers. The industrial robot as a visual element.
Industrial robots as actors — scenarios that the Ars Electronica Futurelab, together with the CREATIVE ROBOTICS at the Linz University of the Arts, has been experimenting with for some time now.
At *The Berlioz Project* at the 2018 Ars Electronica Festival, a robot interpreted music with movements, performing as a real-time visual element, at first alone, then together with three human dancers. This raises a host of questions: Who controls the machine? Is it a human? Is it an algorithm? And at what point does the machine control the human?
This year, the human art of puppeteering is added to the mix: first in the installation *pinocchio* at the Ars Electronica Center, now at the big stage at the Ars Electronica Festival. Human behavior acts as the inspiration for mechanical choreographies, high-tech robots meet fragile puppets, dancers perform together with the inanimate. At the end, a single consideration urgently tugs at human thought: What happens to human-machine interaction when robots do not appear as subordinates, but rather as (creative) partners?

The Berlioz Project: Symphonie Fantastique, Hecor Berlioz (1830); performed by Bruckner Orchestra Linz / Markus Poschner; dancers: SILK Fluegge with Silke Grabinger, Gergely Dudás, Elias Choi Buttinger;
Tour en l´air (spinning dresses) by Ursula Neugebauer; roboter choreography and programming: Johannes Braumann, Peter Freudling, Silke Grabinger, Cori O'lan; visualization and robot-choreography for 3rd movement by Cori O'lan; robot: KUKA KR600 industrial robot / KUKA GmbH
Pinocchio: Ars Electronica Futurelab; CREATIVE ROBOTICS — Kunstuniversität Linz; Johannes Braumann; Amir Bastan, Katharina Halus (Puppenspiel), Michael Lauss (Marionette), Benjamin Krux (3D-Druck), KUKA CEE GmbH, BECKHOFF Automation GmbH

Ars Electronica Japan

Ars Electronica Futurelab (AT)

The Ars Electronica Japan division within the Ars Electronica Futurelab develops cultural programs, consulting services and innovative research in Japan. The team works with citizens, creatives, educational public institutes and with industry representatives to foster dialogue between art, technology and Japanese society.
A unique cultural medium with a mixture of Japanese and European backgrounds, Ars Electronica Japan has developed three main initiatives at the nexus of art and society that aim to promote innovation. Firstly, *Art for Society* offers a variety of cultural programs, lectures, exhibitions and workshops, such as the Ars Electronica in the Knowledge Capital Osaka series, presenting its ninth edition "Playware" from January to March 2019, or the 2019 exhibition *Prix Ars Electronica Selection: Space of Imagination* in Matsudo. *Art for Education* creates new frameworks to apply art to education and research, with educational programs such as the *School of the Future Festival* at Tokyo Midtown in February providing a combination of lectures, discussions, artistic inputs and cultural exchange to fuel the creative society of the future. Lastly, *Art for Innovation* works with the Art Thinking approach to offer new types of consulting, create experience-based visions and spur innovative R&D, resulting in research on ultra-high definition media content (*Beyond the Frame: 8K Future Projects*, with NHK), swarm-based communications technology (*Swarm Arena*, with NTT) or the Tokyo Initiative Art Thinking Program with Hakuhodo. Combined, the three initiatives within Ars Electronica Japan form a creative ecosystem for shaping future society.

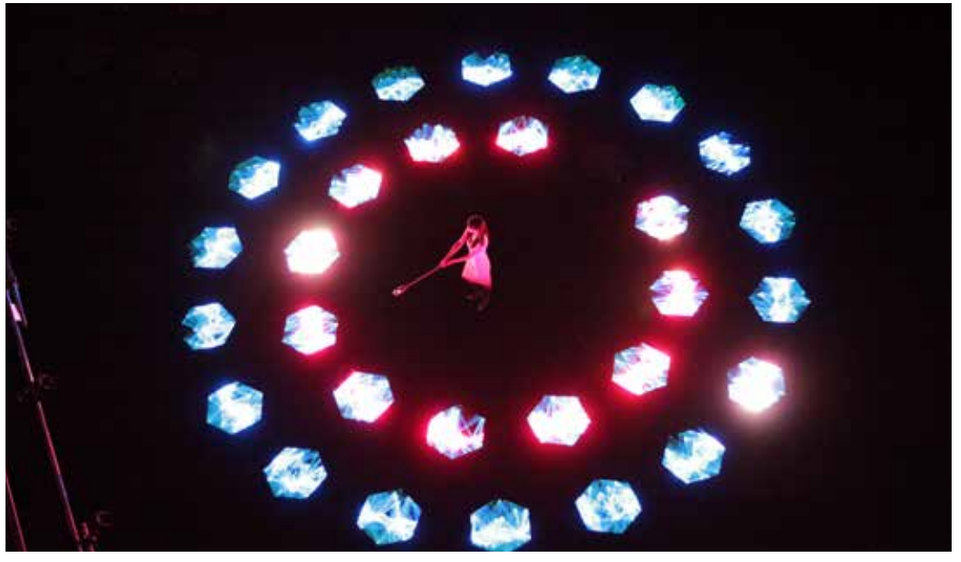
Bug´s Beat, Dorita Takido, Yumi Sasaki, photo: Hajime Kato — Matsudo Space of Imagination

▽

Swarm Arena

NTT (Nippon Telegraph and Telephone Corporation) (JP), Ars Electronica Futurelab (AT)

Swarm Arena is the latest outcome of joint research efforts by the Ars Electronica Futurelab and Japanese telecommunications giant NTT. What started as a shared interest in swarm-based technology has turned into a large-scale project using unmanned aerial or ground vehicles (UAVs and UGVs) as a means of communication. While the very first project, Sky Compass, as well as its follow-up Swarm Compass, focused mainly on navigation, public signage, facilitation of traffic, and swarm intelligence, *Swarm Arena* now shifts the research question to creating an entirely new audience experience at sport events.
Swarm Arena is a travelling lab for art, sport and society that uses a new type of robotic swarm, composed of groundbots, to convey images and video in a way that completely breaks through the boundaries of a conventional rectangular viewing format. After a first presentation to the public in July 2019 at the Japanese National Museum of Emerging Science and Innovation, Miraikan, a Swarm Arena demonstration at the 2019 Ars Electronica Festival shares new possibilities for sport events, public viewing or interactive sports exhibitions with festivalgoers.
Whether it be the innovative visualization of measurements, metrics or competition outcomes, expanding the viewing experience to remote locations, duplicating games or events or creatively using the groundbots to generate unprecedented community experiences, the demonstration gives an insight into the many doors opened up to sports viewing by Swarm Arena.



Shoko Takahashi

Alice and the world of sorrow, Photo: NHK ENTERPRISES

▽

Beyond the Frame: 8K Future Projects

NHK (Japan Broadcasting Cooperation) (JP), Ars Electronica Futurelab (AT)

Ever since its inception in 2017, *Beyond the Frame: 8K Future Projects* has explored the possibilities of 8K ultra high-definition technologies in daily life. The joint research project between the Ars Electronica Futurelab and NHK, Japan's only public broadcasting organization, has brought together vast expertise in 8K broadcasting services on the one hand, and well-founded experience with a new type of large-scale immersive media environments like Deep Space 8K on the other. The research focuses on next-generation broadcast media, ranging from how 8K contents could look for large public screens or immersive environments to the integration of ultra-high definition images into daily life as media furniture or media architecture. Design strategies as well as interaction design are investigated, as is the matter of creating the right context for people to gather by using 8K technologies.

At the 2019 Ars Electronica Festival, a prototype show offers insights into the ongoing research efforts, presenting a new concept of broadcasting content for large-scale screens: Deep Space TV. The program focuses on real-scale content with *Life Scale Weather News* and the *Life Scale Kids Program*, while also presenting possibilities of using immersive environments with ultra-high definition images for a new type of entertainment content.
To this end, the experimental 3D entertainment program *Alice and the World of Sorrow*, telling the story of a girl escaping from Tokyo to another world to find refuge from the increasing complexity of society, is shown. Through these prototypes, the research project aims to extract the most important factors in shifting from traditional TV to experiencing a different, immersive world.

Ars Electronica Tokyo Initiative Hakuhodo x Ars Electronica Art Thinking Program

Hakuhodo Inc. (JP), Ars Electronica Futurelab (AT)

Takuma Terata

Continuing the longstanding cooperation between Ars Electronica and Hakuhodo, the joint Ars Electronica Tokyo Initiative has launched the *Art Thinking Program*, a program for incorporating art into business management and R&D. The innovation generation support service aims to allow business people to encounter and dive into the world of art, as well as allowing artists to do the inverse, creating mutual exchange that cultivates innovation and a creative attitude. The objective is to develop mid- to long-term visions, draw up technology strategy plans, and train the next generation of creative talent, all the while keeping in mind Art Thinking and Design Thinking methodologies central to Ars Electronica's activities. Drawing on art and artistic research as inspiration, companies are encouraged to discover their potential and previously neglected opportunities in discussions and workshops led by Ars Electronica and Hakuhodo. Depending on the business, creative questions fundamental to a company's values and objectives are unearthed, providing an opportunity to set new challenges, assess resources, and envisage the future. The program culminates in the creation of tangible prototypes, embodying the corporate vision.

The *Art Thinking Program* is a place where art and business meet — to discover real issues and work toward resolving them.

FUNGUAGE ROOM

Koichi Araake (JP), Eiji Iwata (JP), Michinari Kono (JP)
BANDAI NAMCO Research Inc. (JP), Hakuhodo Inc. (JP), Ars Electronica Futurelab (AT)

In 2019, the newly launched research institute BANDAI NAMCO Research began its mission of facilitating FUN through creating entertainment innovation. As one of its central research topics, *FUNGUAGE* aims to discover how FUN can make the world a better place and contribute to future society. *FUNGUAGE* is a new form of language that enable humans and objects to communicate more effectively with each other, transcending cultural boundaries with the universal language of FUN. *FUNGUAGE* research has been conducted since 2017, as a joint initiative by BANDAI NAMCO Group, a global leading entertainment company, and Hakuhodo, in conjunction with the Ars Electronica Futurelab. The research outcomes are exhibited in a *FUNGUAGE ROOM*, where the new language is installed in a real-life environment. The aim is to create a common platform for better understanding between humans and objects that will eventually increase engagement between humans and society. *FUNGUAGE* was designed to be a metalingual embodiment of a new relationship in which a FUN spirit is woven at the core.

Text: Kyoko Kunoh (Ars Electronica Futurelab), Rena Tanaka (Hakuhodo Inc.), Hiroyuki Uechi (VoiceVision Inc.)

Magdalena Sick-Leitner

Ars Electronica Research Institutes

A further initiative of the Ars Electronica Futurelab is represented by the newly founded *Ars Electronica Research Institutes*. This organizational form acts as an open membrane of the Ars Electronica, allowing closer collaborations with the academic world. Its first incarnation as an *Ars Electronica Research Institute* is Werner Jauk's "auditory culture sound-gesture-research & emotional interfaces" and Eveline Wandl-Vogt's "research out of the box: the ars electronica knowledge for humanity hub (k4h+)".

Werner Jauk (AT)

AE Research Institutes: Auditory culture

Sound-gesture research and emotional interfaces

Epistemological media art between science and art

A.: THEORETICAL/METHODICAL ASPECTS

Auditory culture

Media worlds manifest themselves to us primarily as visual and speech-dominated worlds– worlds of the symbolic representation of extended bodily interactions with the environment, experienced through images and words. Is this a reduction to the mechanistic reflection on the "view" of things? In a "ratio-nal" worldview, the mechanical body is the measure of all things to which it sees itself in physical relation with. Their design transpires through the formalization of these relationships, conveyed via codes in numerical systems.

There are two implications for the technological developments that have led to the transgression of the mechanistic. Dynamization has resulted in a "frenetic standstill" and, consequently, to a reversal in the perception of the body-environment interaction.

Coding and digitization have produced the concept of practicability aside from material limitations in the virtualities of the immaterial. Both lead to the extension of the body by ultimately rendering it "useless"– the mechanical body, that is.

What remains is the basal, regulatory process of every body-environment interaction; its intentionality. It is this state of being in tension, of the excitation levels of movement and thus sound in the environment that prompts to action.

In an immersive experiencing of the world, hearing is the measure for the behavior of all things through which the hedonistic body experiences itself "in tension," and through which body and environment reciprocally shape each other adaptively. The act of seeing is connected to the thinking synthesis of environments as a construct of time and space based on a series of images of "moments" from static visual fields which are produced through the movement of the body. This synthesizing act of generation, drawing on internal energy and transcending time and space, is ultimately associated with practicability.

Hearing, on the other hand, is the analysis of environmental movements surrounding the body in agreement with their bodily significance. In this process, the body experiences itself as a part of an event, involved in it through the perception of excitation.

Auditory and visual culture

Perception is intentional body-environment interaction according to the affordance of the environment. Control of this interaction through seeing or hearing results in various embodied cognitions, media-relational codings and formalizations in world "images."

Experiments show that visual perception is primarily a coding of things, while hearing is the coding of what are generally unconsciously processed movements of the environment– the "having of in-sight," the appellative recognition, is closer to seeing; intentionality (being "in-tension") is nearer to hearing.

Cultures can be "seen" as the power-related reinforcement of the mediatization and formalization of perception processes.

Visual culture is thus linked to ratio, understood as the relationship of the "enlightening" dimensions of the body and the environment that illuminate themselves through the act of seeing. It is measured in geometry, formalized as an arithmetic, and lived out in a mechanistic worldview– a world formalized in numbers indebted to the "ratio-nal" understanding of explicit knowledge.

Visual culture is predominantly a rationally synthesizing culture achieved through the extension of the moving, mechanical body, and thus the generator of a series of visual fields. The interplay between the "sampling rate" of our information-processing system and the high frequency of the physical medium of light permits the imaging perception of moments that are the result of one's own bodily movement. Time and space are experienced from within as changing or unchanging constructs– formalized in a mechanistic worldview. Auditory culture and the core concept of sound gestures describe the hedonic nature of culture-building interactions of the body with relation to all environments: the "natural," social and physical, as well as the virtual and all their conversions. It is the prompt value of environmental movements that situates the body in an interaction with it, traduced as emotion through motion. The action is thus an implicit recognition of the significance of movement to the body.

Auditory culture is predominantly an analysis of movements in the environment according to their bodily significance, resulting in a culture that manifests itself in the sound gesture as an impression of movement and the expression of said movement's significance in physical and aural terms. In the specificity of a sonically performative interaction as opposed to a visual one — instrumental action — the sound gesture may be regarded as a model for emotional interaction.

Even the dynamization of the image as a series of "moments" has been considered a musicalization following from the dynamic of hearing as a temporal analysis of movements, formalized in music.

In a mediatized worldview, the acceleration of information transference to a "frenetic standstill" is an anticipation of Marshall McLuhan's idea of "all-at-onceness." Its mode of perception is that of the phylogenetically earlier sense of hearing, the analysis of movements that surround a mechanically static body.

McLuhan's suspicions are now anchored in the empirically validated concept of the sound gesture. Sound is an artifact of movement; its perception produces a physical impression the

intensity of which constitutes the significance of that movement for the body that's being placed in tension by it. The body expresses this tension, which directly leads to sound production through the body or through instruments– musical or otherwise — that extend it. For the purpose of increasing its "chance of survival," this sonically performative expression has a communicative effect: through (physical) imitation, it invites to internalization; it is "emotionally contagious." Culturally speaking, we refer to qualities of excitation as emotions, which will vary according to the situational context.

Sound gesture is a sonically performative modality of the human body's interaction with the environment, which — based on its analysis of movements according in relation to their bodily excitation value — experiences an analyzing, shaping "in-tension." This corresponds to an intentional body-environment interaction; a hedonically dominated, mechanically passive shaping of virtualities — mechanical and non-mechanical — in harmony with the body. While digital culture — as a seeing and mechanistic culture — brought with it the transgression of the body; post-digital culture features the inclusion of the body in the artificial worlds/natures of "converged realities."

Sound gesture: paradigm of emotional experiential worlds, extending beyond the sonically performative.

Sound gesture is the paradigm of bodily life and, consequently, the shaping of converged realities. Excitation-based and proximal emotional interaction is the paradigm of intuitively emotional interfaces.

Sound gesture is thus the composition of two compressed sonic performativities:

1. the imagination and the bodily comprehension of the sound in its modulation and so in its emotional, spatio-temporal "movement" at a remove from physical spatialization, and;
2. the bodily expression of the significance of this "movement" for the body and through its state of tension is based on its affectedness, which correlates in turn to its intensity (sharpness/loudness). This physical tension naturally finds expression in bodily movement as well as in "sound"– in other words, it directly communicates "excitation."

The concept of sound gesture describes the nature of the body's culture-building interactions with "natural," social, physical, as well as virtual environments, and their conversions. In the specificity of a sonically performative interaction as opposed to a visual, instrumental action; the sound gesture may be regarded as a model for forms of emotional interaction.

In contrast to cognitively controlled visual and instrumental action, motion stimulates emotion which, in turn, expresses itself in physical motion.

Detailed knowledge exists about the connections between the movement of sound, physical excitation, and their physical expressions. The technology of motion — tracking, in conjunction with structures of extraction analyses for the movement data, permit adaptive, individual — as well as collective and collectivizing — interactions and, it follows, the intelligent, emotional generation of "environments" for wo-men-machine interactions.

Sound gesture is also a method of exploring emotional interactions and their shaping of converged realities. It permits the coding of proximal sonic performativity; with the observation of behavior serving not so much as a figuratively referential indicator of intentionality, but rather as a part of the act of experiencing.

Post-digital media art is therefore also the paradigm of an epistemological media-art whose center of scientific cognizance is the act of experiencing, and the study of explicit and implicit body knowledge, its formalization and communication.

Sound gesture and music

In the history of music, the sound gesture gained initial significance with the emergence of notation from the process of sound conveyance/mediatization: the imagination of the movement of sound through the perception of sound modulation led to the graphic recording of the ephemeral sound.

The analog cues of the melodic contour in the neumes, and their gridding in a time and frequency domain, eventually gave way to musical notation, a code system that discretely denotes sounds in terms of duration and frequency.

Thus, the analog cues, as well as the discrete notation in itself, represent a medium for the communication of sound, its storage, distribution and, finally, for its deliberate assembly/composition; one (seemingly) no longer restricted to the nature of emotional expression. Creation by means of "notation" is, in this regard, a paradigm of the human shaping of interactions with digital worlds. With the transgression of the mechanical body through the digital body, the inclusion of the hedonistic body becomes the new measure/counterbalance of a post-digital world– with "musical behavior" as its new design paradigm. Chironomy, or the hand movements of the conductor, traces the contour of the melody to convey the temporal flow of tension in the sound and, with it, the emotional interpretation of the perception. Performativity aside, the "sound" in the sound gesture as prosody lends emotional expression to the content of the language. Both chironomy and prosody are usable emotional interfaces.

Unlike an instrumental gesture (such as "touch") as the course of action of an activity, the sound gesture is the expression of that action's "how". In short, it communicates the emotional quality of every body-environment interaction (also dependent on its "affordance," that is, the prompting character of environmental stimuli).

The methodology of sound gesture research

With regard to methodology, sound gesture research is primarily focused on the expressive quality of the upper body; with data on full-body forms of expression (in movement) and facial expression showing corresponding relations.

Research into sonic performativity by means of motion-tracking and sound-generation has now provided a great deal of basic knowledge on emotional expression within the dimensional concept of emotions and the connotatively perceived dimensions of "activity," "evaluation," and "potency" of stimuli.

The way in which categorical conceptions of emotions — "bodily" states that we refer to with names (such as joy, irritation, rage, etc.) — are experienced is possibly shaped to a very large degree by culture and affirmed in this through verbal designation. The communication of the quality of verbal categories for emotions through sound gestures occurs more frequently in an exclusionary context where sound gestures "show" what verbally denoted categories of emotions can't express.

An emotional "semantic space" for excitation-related physical forms of (expressive) movement and their corresponding perception can be formulated and applied.

Experimental laboratory research into sound gestures and epistemological media art

Experimental research sees in the sound gesture the comprehension of the imagination of sound as spatial movement, though without any physical spatialization and solely through sharpness and loudness. This is based on embodied cognitions, as well as on a conceptual metaphor, namely, the transmission of "gravity" into the sonic sensations of "volume" and "density." Related to this imagination of movement in the frequency domain are its corresponding body movements (with similarly corresponding movements in the time domain of, say, acoustic driving).

Likewise, the sound gesture is the physical expression of the significance of this (or another) movement for the body. In the body's state of tension, it is an "implied" reaction to a stimuli of any kind– be it physical, or social. In the latter, the sound gesture is a non-verbal, expressive stimulant aimed at collectivization and, in its extension, at collective shaping. The sound gesture is thus a stimulant for communication, for the act of con-joining together, rather than a medium for information transfer.
In addition to explanatory lab research, research is also aimed at exploring the experiencing of the experienced, with no intermediary transpositions through language/visualization and thus thought. This research therefore sees itself as **empirically epistemological art that renders bodily experience as a method of cognition of a "tacit dimension" — an implicit body knowledge.**

B.: EXPERIENTIAL AREAS FROM THE TRANSMISSION OF MUSICAL COMMUNICATION

That which is explored in epistemological media-art and studied in laboratory experiments can be applied to musical and non-musical emotional communication processes.
The concept of the sound gesture attained cultural valuation through notation and the resulting concept of "music-as-work." Notation is regarded as a medium for the coding of a physical "tension resolution," that is, as an intermediate transposition of direct emotional means of expression in "correlative thinking" — the deliberate shaping of sound-related realities. This concept is the paradigm for intuitive interfaces in a digital culture. "Intelligent" forms of interaction, and thus also of creativity, enrich their basis for rational creativity through the excitation-based, emotional interactions of post-digital culture and– following the transgression of the mechanistic and the surmounting of the mechanical body — leading to a culture of "converged realities" which, through the inclusion of the hedonistic body, shapes itself in digital realities.

Sound gesture and experiential culture

It is commonly known today that music/sound as a "language of emotions" is an adequate metaphor. Sound is an artifact of motion and emotion (as physical tension movement); sound, through "emotional contagion," stimulates the comprehension and subsequent internalization of dynamic excitation. The interpretation of this excitation with regard to the verbal designation of feelings is a matter of context, which happens seemingly outside the world of sound. Nevertheless, natural, physical tension stipulates the cultural framework of a sound form– whether it be in the thematic work for an opera in scoring films and games with sound branding.
In an experiential culture, behavior is linked to images even if experiencing them is not specifically material/pictorial. It is an abstract, temporal behavior, a sense of tension as with sound. Excitation behavior allows us to experience the "choice" in close proximity as an interactive process in the "all-at-onceness" of every kind of media.

Sound gesture and converged realities

This state of research — particularly as it relates to a post-digital culture through the inclusion of physicality in converged realities, and not in the surmounting of mechanical physicality through its extension in robotics — is the paradigm of the emotional interaction as a method of communication, of "becoming communis;" appertaining not to "what" a system should do, but rather to "how" it is to act in interaction with human bodies. This "how", then, is to be recognized from the physical expression for the machine, whereupon the system will behave in an adaptive manner, and the machine interact in accordance with "human" expression (that is to say, in reciprocity with the attunement of the participating bodies, with each adapting its behavior to the other.) This results in a common emotional system.

Sound gesture as a psychological interface

Building on early graphic tests and later evaluations conducted with motion-tracking systems, and after making a synopsis of previous existing results and conducting experimental research into unknown "gaps," we undertook the prognostication of a theoretical description/explanation of the sound gesture. In addition to the use of the body-sound coupling through the technical control of sound by the body, the integration of this empirical knowledge into a structure of perception as an intentional body-environment interaction between media theory and evolutionary psychology makes its paradigmatic application to interface design a possible life situation connecting the intentional with the instrumental aspects of the interaction.
On this basis, it isn't just explanations of historical musical developments that can be carried out, but also developments in direct, physical sound-shaping that, on account of their directness, can advance a technoid way of music-making that's for every-body. Its use outside the social/political composition of works (which ultimately evolved with notation) extends far beyond the field of applied musicology.
Sound gesture is a paradigm of the emotional (stimulation-based) interaction with physical and social environments/virtualities and their conflation due to its affordance for the body.

Music and the algorithmic shaping of time according to body tension

Music and AI

In keeping with Marvin MINSKY's question of what AI would be without the inclusion of emotion, the generation of virtualities is extended according to behavioral analysis that considers their intentionality; that is, the tension control of body-environment interactions on the basis of the excitation levels of environmental stimuli. Their un-mediatedness is assessed, after the paradigm of the sound gesture, in accorance to the hedonistic physicality.
Through the coding of sounds in notes/numbers, the energy tension of the sounds with relation to each other was translated into "correlative thinking;" so that the composition of music became a kind of algorithmic creative process. Rules indicate the relationships of the codes to each other in normative terms. Information theory permits the mathematical description of this relationship as a chain of transition probabilities. Analyses of compositions thus extract/render a regularity that, when described in algorithms, can be applied to the composition of "new" music. This is the beginning of computer music and, ultimately, the structuring of music from the its "artificially" established rules.
In fact, the use of AI in music has not only always existed; a side-effect of it was/is algorithmic creation in agreement with rules that are as "emotional" as possible.
New experimental aesthetics (BERLYNE 1971, 74), using information theory (SHANNON et al. 1949) as a basis, statistically formulated the excitation level of a series of sounds as an expectancy value, to develop a theoretical and methodological groundwork for AI integrating emotionality as a creative tool in the design of dynamic experiential worlds.
"Media" that's close to the body — that is, stimulative, intuitive interfaces — constitutes the technical basis for ascertaining emotionally experienced body tension through the paradigm of the sound gesture.
It is technoid, popular music-making (such as the compilation of individual playlists from "samples" according to reception behavior)

and functional music (as in that of games) that recalls how the intelligent arrangement/ordering of codes for sounds follows the emotion-regulating reception and thus, the activation regulation found in tension resolution.
AI takes musical composition back to the original form of music-making, involving physical interaction with sound as a medium of communication with the social and physical environment. Adaptive sound environments, interactive mood management, etc. are all areas of application — or, rather, for the life — of AI sound design.
AI is thus the structuring of codes that not only indicate excitation levels and their "correlative thinking," which ultimately formulate tension resolution. It is based on emotional decision-making processes that are a direct part of the physical experiencing of environments.
Tested in music and developed from it, culture is no longer the idealistic, rational overcoming of nature, but rather a life in and with natural, as well as virtual, experiential worlds based on the needs of the body.

Music and auditory culture

To the extent that — following a psychological approach — music can be regarded as the formalization of nature or — according to the anthropological approach — as a cultivation of hearing, auditory culture is musical culture. It plays with the unmediated sensuous/physical quality of a sound that can be experienced only as a time-space event in physical "tension resolution," and with its transmission/mediatization through codes/notation in "correlative thinking." While the visual medium of notation and its coding led to the removal of the hedonistic body, the aesthetic demand of music comprehension through reading (in conjunction with the bourgeoisie's political striving for emancipation) and media technologies has made possible the development of "forward back", wherein music is increasingly a physical and technoid act of music-making by and for every-body, with technology serving as an "amplification" of this physicality.
The impact of music extends beyond itself. Musicalized culture is, in addition to its hedonistic designation, dominated by excitation-based behavior in every area of quotidian life. It is the very "cultural medium" that, as a physical stimulant in the situational mood of pluralistic individuals, is lived most intensely in everyday culture, be it through making or consuming music. And these borders are also and increasingly in flux, as is the structured understanding of music and sound. In this sense, music-making is both an aesthetic and a sociological way of life.
Mediamorphosis regards media-related technical developments as being rooted in aesthetic, as well as social and cultural changes. Acceleration/dynamization and coding/digitalization have, contrary to the surface observation of the dominance of visual culture as a static and analog "imaging culture," led to a musicalized culture of "all-at-onceness" that adheres to an internal auditory logic, and leads to the hedonistic analysis of dynamic events surrounding the body.
Sound can only ever be perceived in time; its formalization as music is a dynamic type of time structuring. The storage of this ephemeral form occurs via visual (analog) "imaging" and its coding. Its "intentional" design thus takes place early on, in a "coded" fashion, with the assembly/composition of codes for sounds according to "correlative thinking" ultimately leading to to the Western concept of "the work".
But analog forms of music-making have existed all over the world in a much greater number– the renewed attention paid to them increasing with the physical "handling" of "artificially" made sounds. Post-digital culture is, to a large extent, defined by the inclusion of the homeostatically regulating body. The sound gesture was, and is, the central form of interaction at the basis of these cultural developments. After the algorithmic design of virtualities, the design of "converged realities" wil arise increasingly as a result of hedonistic physical interaction.

C.: APPLIED RESEARCH BETWEEN SCIENCE AND ART: MEDIA-CULTURE AS AUDITORY CULTURE

Applied research builds primarily on research on the sound gesture, expanding its application as a transference of basic research to all forms of emotional interaction and mass communication between "wo-men"-machine-/ "wo-men"-"wo-men" in both real and artificial form. Methodologically, this is determined by surmounting lab research and in the overlap between field research and an understanding of media-art as epistemological. Research in the experiential situation makes this the new paradigm for applied cultural research. In our case, the formalization of hearing is the method used, and one that is in keeping with the character of auditory culture.
The idea of original music-making by folk cultures is closely related to the development of the music-making body as an "instrument" for every-body, which is to some extent already lived out in technoid music cultures. This emotional music — which is artificial in terms of sound and changeable according to the regulation of moods — is dynamically collective and producing collectivizing sound streams that are distinct, in time and space, from the mood management of adaptive sonic environments that is applied to private and public habitats in artistic and functional contexts. They are, for example, developed in therapeutic body work in clinical and wellness areas as applied sound gesture research. In this sense, adaptive living environments are based on the inclusion of emotional body tension as a part of the artificially intelligent behavior of environments. They are, likewise, intuitive interfaces that make use of implicit and emotional bodily knowledge. Similar theoretical and methodological concepts are extended to behavioral analysis, where data is derived not from the number of associated actions as indicators for "desires," but rather from "how" a behavior is played out dynamically. Emotional decision-making/action as a paradigm for the emotionalization of intelligent instrumental behavior is thus used in fields such as sound design, game design, and marketing.
Finally, research designs from the new experimental aesthetics are applied to experimental philosophy (x-phi) to develop and test models for ethical decision-making in converged realities, especially as relates to the interaction between humans and automated worlds.
The un-mediated, signal-like interaction regarding sound gestures, the interaction with the in-tentional body, represents the foundation for all applied research.
Auditory culture attempts to transcend its limitation to music-related research and its explanatory and applied findings for music. In general, and based on systematic musicological (as cultural) research, the question to be explored is "What is music to ... bodily life in media-cultures." In the process, the epistemological value of music and music-making for a bodily life in post-digital cultures as part of epistemological media art is to be generalized.

Eveline Wandl-Vogt (AT)

research out of the box: the ars electronica knowledge for humanity hub (k4h+)

Throughout the centuries there were men who took first steps down new roads armed with nothing but their own vision.
Ayn Rand

We are passionate, we want to push ourselves and we want to push the limits of our science — and the currency is knowledge.
Markus Nordberg

k4h+ | knowledge for humanity hub is a brand-new research institute established in the Ars Electronica Futurelab in 2019, aiming to accelerate humanities knowledge into action. With its antidisciplinary approach, it intends to contribute to inventing the future and re-thinking genres, applying open innovation in science methods and practices based on an RRI-mission statement. *k4h+* applies exponential thinking against a background of humanities in open and experimental discovery processes, furthering cognitive, creative, interpersonal, and intercultural skills.

k4h+ aims to establish one of the central cornerstones of the open innovation research infrastructure (OI-RI; c.f. figure1), which was designed in a multistakeholder process in 2017 led by the author at the Austrian Academy of Sciences. *k4h+* acts as a knowledge designer to enable and create cross-organizational, cross-sectoral knowledge partnerships of purpose and to co-design and co-develop innovation networks, applying humanity-centered design.

The first project issued in the hub and introduced at the Ars Electronica Festival 2019 is a globally collaborative approach reflecting the mid-life crisis of the digital revolution: the algorithm inventarium (AI+), reaching out for bias research against the background of artificial intelligence. Technologies do not emerge from nowhere. They are shaped by implicit and explicit choices and thus incorporate a set of values, norms, economic interests, and assumptions about how the world around us is or should be. Many of these choices remain hidden in software programs and the algorithms they implement (cf. Vienna manifesto on digital humanism). European values — especially referring to the rich European cultural heritage and the ideas of the Kantian "categorical imperative" — might find themselves in tension with a data flourishing society (cf. ALLEA flourishing in a data enabled society).

AI+ aims to create awareness and knowledge from an antidisciplinary perspective about how algorithms surround us and determine our everyday life in many ways. They operate invisibly through our progressively digitized contexts, such as newspapers, social media and digital GLAM objects. AI+ against a background of digital humanism and on a participatory path aims to discover hidden biases and power structures and critically reflect on the societal impact of certain technologies, focusing according to Joichi Ito on the complex ecosystem that emerges from the network of minds and our society. It encourages artistic recreations and experimentation with digital algorithms in various cultural contexts. It aims to offer educational materials and toolkits for reuse in other awareness- or research-based initiatives. It invites speculative formulation of new possible algorithms, based on the knowledge generated. Current project partners are Exploration Space at the Austrian Academy of Sciences, Austrian Centre for Digital Humanities | AT, CERN ideasquare | CH and metalab (at) harvard | US.

ars electronica, futurelab, k4h+
österreichische akademie der wissenschaften, austrian centre for digital humanities (research manager)
metalab (at) harvard (research affiliate)

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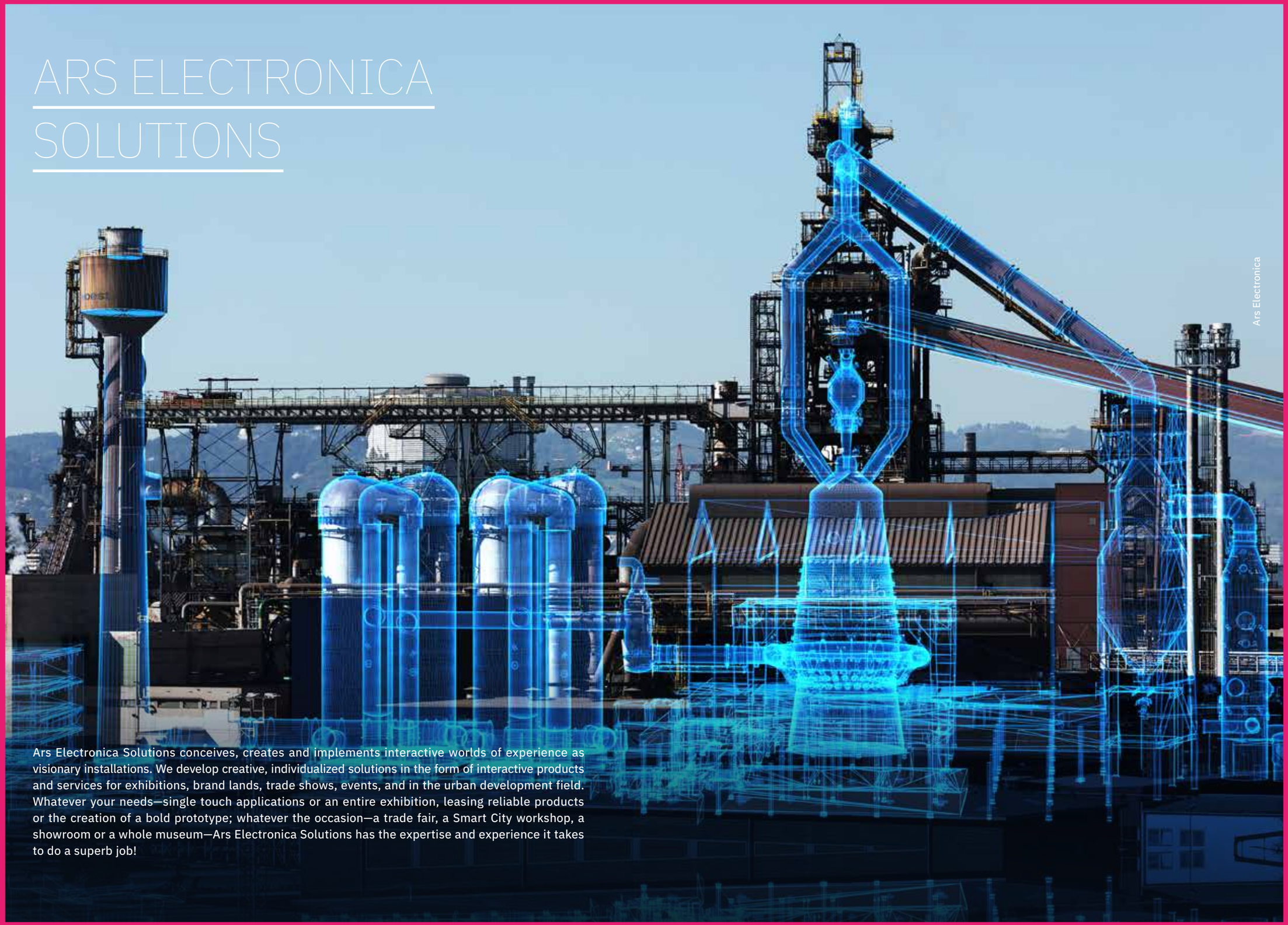
ARS ELECTRONICA SOLUTIONS



Ars Electronica

Ars Electronica Solutions conceives, creates and implements interactive worlds of experience as visionary installations. We develop creative, individualized solutions in the form of interactive products and services for exhibitions, brand lands, trade shows, events, and in the urban development field. Whatever your needs—single touch applications or an entire exhibition, leasing reliable products or the creation of a bold prototype; whatever the occasion—a trade fair, a Smart City workshop, a showroom or a whole museum—Ars Electronica Solutions has the expertise and experience it takes to do a superb job!

INNOVATION & CREATIVITY

We scrutinize and tinker, think and create, design and test — sometimes with such outstanding success that we can see right away that the results are suited to many different applications. That's how prototype development can lead to products that can be customized to a client's specific needs. And that closes the process chain from idea and vision to prototype development and ultimately to an innovative product. The various interfaces we build into our productions are intentionally futuristic — direct communication between the human brain and a computer, interweaving real and virtual scenarios, and creative artificial intelligences.
But then again, we use Ars Electronica's decades of experience with technologies, as well as the spirit and creativity of Ars Electronica Solutions, to create custom-tailored solutions depending on the client's target groups and environment. Thanks to this balanced mix of cutting-edge and traditional technologies, our work boasts intuitive interfaces and creative storytelling.

voestalpine Wire Rod Austria, © Ars Electronica

EU Presidency Austria, © Ars Electronica

Expo Austria, © querkraft/pagiencki

AUSTRIA@EXPO DUBAI: The Austrian Pavilion

"Connecting Minds, Creating the Future" — EXPO 2020 Dubai addresses the issue of visions for the future, and concepts and technologies for living together in an increasingly networked world. The Austrian pavilion "in dialogue with Austria" offers the necessary space to enter into dialogue with the most important questions about a shared and brighter future.
We are very proud to conceptualize and plan the exhibition area inside this outstanding architecture with querkraft architekten as a client, to represent Austria with a pavilion that sparks curiosity before the visitor even enters.

voestalpine: Mixed Reality Drone Race Performance

An extraordinary spectacle accompanied the opening of the renovated large blast furnace A in Linz, Austria. In order to get across the incredible dimensions and the state-of-the-art digitization and automation of the production processes that will go on inside it, we conceived a performance starring racing drones and staged it before an audience of VIPs in business and government. Four drones flew at up to 80km/h around and into the blast furnace. The mounted cameras allowed the audience, who followed the pictures on huge monitors, to go on a rapid journey and get spectacular insights in real time through a pre-produced 3D video.
Mixed Reality manages to show visible and invisible building elements as a dynamic unit in a unique way, and to depict an intensive mixture of analogue and digital reality.

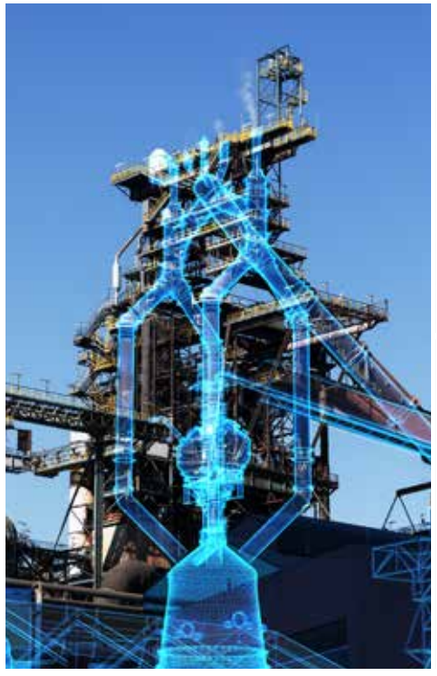


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ABB CIMAC Dinner

büro wien inszenierte kommunikation marketing gmbh (short büro wien) planned an event for ABB in Vancouver, Canada. A pier in the north of the city was selected as the location and event tents were set up there. One aim of the event was to inspire visitors with the help of modern media technology and an innovative, intelligent overall concept. With this goal in mind, Ars Electronica Solutions conceived and realized show elements based on modern media technology.

One part of the show was an interactive live performance: a performer put on a motion capture suit equipped with motion sensors that were fixed to the body.
The dancing motion sequences of the performer were taken from the sensors and then translated into dynamic visualizations. The live visualizations inspired by physical phenomena (particle system) were played on several coupled LED steles during the performance.

Walking Music: Music Architecture @ Erste Campus

Walking Music is an interactive social music installation that turns the Erste Campus into an instrument. Every person moving there triggers a number of sounds in real time. One person crossing the Campus creates a melody, many people create a harmony. A tracking system captures movements and triggers musical sounds over a multitude of loudspeakers.
This piece of music architecture was realized by composer Rupert Huber in cooperation with Ars Electronica Solutions. He is widely known for his piano music and music installations, his electronic music project TOSCA and his collaboration with Ars Electronica.
For Huber, music is communication as well as an active state of peace.
His theory of composing, called dimensional music, considers physical space and unknown possibilities to create social and participatory music architecture.

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PROJECTS

We delight in smart design, demand the impossible, and nurture playfulness. Our projects make the unattainable come true. Regardless of what message you want to send in today's world, we can get it across in digital media. Our solutions are aesthetically sophisticated and creatively extraordinary; they encourage hands-on exploration. We offer digital installations and productions ranging from small-scale highlights to conceptioneering and producing elaborate exhibitions. We work with major institutions such as the European Space Agency and the Humboldt Forum, high tech brands like MED-EL and LIWEST, municipalities and special organizations including the City of Timisoara and the Chamber for Workers and Employees, and such private-sector heavyweights as KTM, KEBA, Liebherr, Palfinger, Rosenbauer and voestalpine.

AK Wien, Out of Control, © Ars Electronica

LIWEST Experience Shop, © Ars Electronica

Timişoara 2021: Light of Freedom, Lumina Libertății, © Seba Tătaru

KTM Innovation Lab

Particularly noteworthy among our recent projects is the Innovation Lab, an interactive lab created for KTM Motohall GmbH in Mattighofen, Austria. Embedded in the KTM Motohall, which offers an unforgettable motorsport experience, the goal in the Innovation Lab is to give children and young people in particular a playful way to experience design and high tech. In the Innovation Lab, they learn how to deal with design and production processes and the associated tools, such as various design software programs, laser cutters for cutting and engraving, and 3D printers that convert digital models into physical objects. In these processes, children and young people are shown their manifold possibilities.
In the Innovation Lab they can take part in an entire cycle — from the birth of the idea to its actual realization and production. The aim is to encourage them to give free rein to their creativity and to become more willing to take risks — to put ideas on the table without fear of failure. An additional goal is to teach the children basic knowledge about electrical engineering, programming & digital design in a playful way. According to the motto "Learning by Doing/Do it yourself," young people are encouraged to develop curiosity in unfamiliar topics and to continue to deal with them and acquire expertise.

KTM Motohall, © KTM GmbH

KTM Innovation Lab, © My Trinh Müller-Gardiner

KTM Innovation Lab, © My Trinh Müller-Gardiner

EXHIBITIONS & BRANDLANDS

Many of our commissions require us to produce exhibitions. We conceive and execute interactive installations and participative formats for many different purposes, featuring a wide variety of content. Deploying our didactic experience and creative spirit, we configure amazing worlds in which visitors immerse themselves through identification and participation. To carry out these assignments, we implement the most innovative communications trends and the latest technologies. Our creative endeavors follow through on the artistic approach of Ars Electronica.

ESA Φ Experience, © Ars Electronica

AK Wien, Out of Control, © Ars Electronica

Undasch Pavillons, © Ars Electronica

LIWEST Experience Shop, © Ars Electronica

Innsbruck Tourism: Reopening Brings Historical and Digital Info about Innsbruck

Following a seven-month closure due to renovation work on the historic walls of Innsbruck's Burggraben, Innsbruck Info, the city's tourist information office, reopened to once again provide outstanding service to 500,000 visitors per year from all over the world. And the facility is now equipped with modern digital technologies — implemented by Ars Electronica Solutions in close collaboration with an architectural approach that reflects and respects the historic site. The new Innsbruck Tourism Information won the Tirol Touristica Award 2019. The jury particularly praised the "combination of historical and modern" and the "multi-layered successful showcase project as a calling card for Innsbruck."

Innsbruck Tourismus Information, © Ars Electronica

Innsbruck Tourismus Information, © Ars Electronica

Ars Electronica: Global Shift

In the new Ars Electronica Center exhibition "Compass — Navigating the Future," the long-standing collaboration between the European Space Agency (ESA), the German Aerospace Center (DLR) and Ars Electronica Solutions helped to create a couple of exciting, unique and innovative areas inside the exhibition "Global Shift." With "Fragility and Beauty," we take visitors on a stunning journey to beautiful and remote places of our fragile world. "Glacier Retreat" deals with the phenomenon of glacier disappearance, placing it in a local and global context. Combining haptic elements like the milled elevation model of the mountain region of Hohe Tauern with digital technologies offers the visitors an individual interactive experience.

Glacier Retreat, © Ars Electronica

Fragility and Beauty, © Ars Electronica

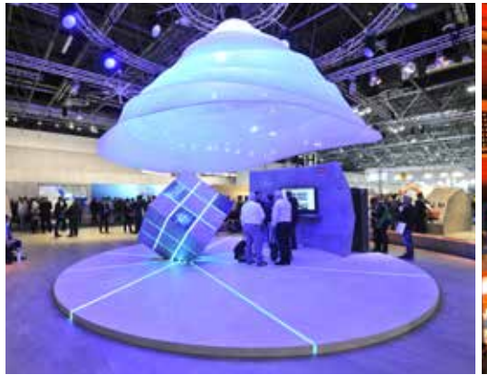
TRADE SHOWS

Ars Electronica Solutions' portfolio includes an increasing number of trade show stands produced in recent years — from classic presentation settings to interactive experiences. We us innovative technology set in an eye-catching architectural package, and give it a convincing storyline to create a unique attraction. Moreover, these stands are designed with modularity in mind, so they can also be used after the show is over at a corporate headquarters, an event or other formats.

And experts in this field have been duly impressed. The aim is to build up long-term cooperative relationships with such clients as Palfinger and Liebherr to gain additional advantages and synergies for the partners.

Liebherr at bauma 2019, © Ars Electronica

METEC, © C26



Fronius Booth, © Fronius

Living Planet Symposium Prague, © Ars Electronica

Palfinger at IAA, © Ars Electronica

Palfinger at bauma, © Ars Electronica

Palfinger at bauma, © Ars Electronica

Palfinger: Digitalization on the advance at the IAA and the bauma

Palfinger, a global player in innovative, reliable and economical lifting solutions for commercial vehicles and maritime applications, commissioned us to come up with an extraordinary trade show concept for the next big trade shows promoting digitalization, innovation and service. At the International Motor Show (IAA) — the leading trade fair for mobility, transport and logistics — Palfinger will unveil the newly designed area for digitalization under the name NEXCELLENCE, where visitors can get an overview of Palfinger's digital products and explore them interactively. Different crane models can be experienced virtually and in 3D on VR simulators, the Smart Eye connects the technician on site with the live support. On the interactive service wall, a combination of print, projection and monitors will be used to showcase Palfinger's comprehensive, lifelong service. At the bauma 2019 — the world's top mining and construction machinery fair — the visual, architectural and interactive concept was adapted and further developed.

ARS ELECTRONICA EXPORT

Orbits, Quadrature (DE), photo: Hajime Kato

Since 2004, Ars Electronica has worked with partners in art and culture, science and education, commerce and industry to produce a diverse array of projects all over the world. The spectrum includes exhibitions and presentations, conferences and workshops, performances and interventions. What these collaborative activities have in common is the inspiration they derive from the ideas and visions of Ars Electronica's worldwide network.

Ars Electronica EXPORT offers partners the possibility of selecting from a menu of individual options or deciding on a complete package — depending on their particular wishes, interests and resources. It's up to the partner to decide whether a package of exhibitions, presentations, conferences and workshops are the most cost-efficient way to achieve their objectives, or if the way to go is with selections that are curated by Ars Electronica in accordance with thematic, technological or historic criteria and also flexibly permit the integration of our partner's artistic and technical know-how. Whether it's a complete package or customized program of activities, our job is to create just the right lineup of inspiring artistic and scientific projects, align them into a path that builds on the successes of the past and is conducive to a promising future, and to work together with our partners to get the latest developments at the interface of art, technology and society across to international audiences as a means of initiating a discussion today about the ideas of tomorrow.

ars.electronica.art/export

Tokyo Midtown: School of the Future Festival

Tokyo Midtown, Tokyo, Japan

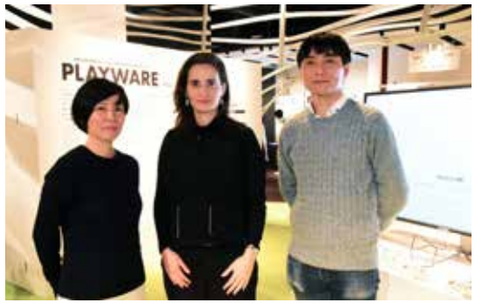
February 21 — 24, 2019

With the *School of the Future Festival* from February 21 to 24, 2019, in the urban complex Tokyo Midtown in Japan, the series of presentations and discussions that has been running since 2017 is once again dedicated to future themes at the intersection of art, technology and society — this year, for the first time in the form of a four-day festival. The "School of the Future" is intended to be a place where children and adults can reflect on the future — through exhibitions, workshops and lectures.

Giri Giri was the theme of the first festival edition of the School of the Future. Sixteen artists presented their works and sixteen partners were involved in this four-day festival, which counted 123,457 visitors. A total of 29 events took place at the 2019 School of the Future Festival, about which 162 media reported (total reach: 4.62 million). Find more at *www.tokyo-midtown.com*

Balance From Within, Jacob Tonski (US)
The Long Now, Verena Friedrich (DE)
ObOrO, Ryo Kishi (JP)
πTon, Cod.Act (CH)
SEER: Simulative Emotional Expression Robot, Takayuki Todo (JP)
I Wanna Deliver a Dolphin…, Ai Hasegawa (JP)
Heteroweave, Yasuaki Kakehi Laboratory, The University of Tokyo (JP), HOSOO (JP), Yamaguchi Center for Arts and Media [YCAM] (JP)
Future Flora, Giulia Tomasello (IT)
ELECTRONICOS FANTASTICOS!, Ei Wada + Nicos Orchest-lab (JP)
GiriGiri Kit, Ars Electronica Futurelab (AT)
https://www.tokyo-midtown.com/jp/event/school_future/

Tokyo Midtown



Knowledge Capital

Ars Electronica in the Knowledge Capital — Playware (Vol. 9)

Knowledge Capital Osaka, Japan

January 16, 2019 — March 31, 2019

With an inspiring mixture of exhibition, lectures and workshops, *Ars Electronica in the Knowledge Capital* brings media art to Osaka, Japan. The 9th edition of this event series is dedicated to the theme "Playware." The playful approach has accompanied the development of the computer from the very beginning. After all, play is one of the most important behaviors for human beings when it comes to acquiring new knowledge and skills. The exhibition deals with the importance of modern gaming and the playfulness of society.

Musical Shadows by the Canadian artist duo Daily tous les jours invites the visitors to play with their own shadows. The Japanese media artist Jun Fujiki presents several projects that playfully deal with algorithms. With *Flower of Time*, Ars Electronica Futurelab brings another participative element into the exhibition — visitors can visualize and collect ideas on how to use time.

With: Daily tous les jours (CA), Jun Fujiki (JP), Ars Electronica Futurelab (AT), Kyoko Kunoh (AT/JP)

Prix Ars Electronica Selection: Space of Imagination

Matsudo International Science Art Festival, Matsudo, Japan

October 20 — 21, 2018

Flower of Time — Ars Electronica Futurelab, Photo: Hajime Kato

Orbits — Quadrature (DE), Photo: Hajime Kato

The Space of Imagination exhibition presents selected, award-winning projects of the Prix Ars Electronica during the Matsudo International Science Art Festival in Japan. *Bug's Beat* by Dorita Takido and Yumi Sasaki is a project that amplifies the sound of steps made by the countless small insects among us, and thus aims to create an awareness of the blossoming micro-world around us. *Orbit* from Quadrature goes another way and leads us to the macro level of space and beyond human perception. The positions and traces of unknown artifacts revolving around the Earth are visualized here in real time. *Flower of Time*, developed by the Ars Electronica Futurelab, is a participative workshop that engages us in ideas of time. The workshop installation reveals the elastic nature of time and asks us to reflect upon ideas of our own "sense of time."
Find more at: s*cience-art-matsudo.net*

Orbit, Quadrature (DE)
Bug's Beat, Dorita Takido (JP), Yumi Sasaki (JP)
Flower of Time, Ars Electronica Futurelab (AT)
Organizer: Matsudo City; supported by the Agency for Cultural Affairs, Government of Japan in fiscal 2018
http://science-art-matsudo.net/

Prix BLOXHUB Interactive — how can we make cities more livable using digital technology?

Prix BLOXHUB Interactive is an international prize, symposium and exhibition focused on creating more livable cities.
Working at the intersection between Space, Technology and Behavior, the initiative was developed by The Alexandra Institute (DK), BLOXHUB (DK) and Ars Electronica (AT). Together, the partners wished to join forces in gathering and building new knowledge that can help companies, creatives and researchers achieving the UN's Sustainable Development Goal 11; to make cities and human settlements inclusive, safe, resilient and sustainable.
In 2019, we received 122 submissions from 34 different countries, and the jury (see: https://prix.bloxhub.org/the-jury) chose 2 winners and gave 8 projects honorary mentions.
The winner in the Concept Category was *Flora Robotica*, submitted by a team from CITA; Phil Ayres, Emil Fabritius Buchwald, Sebastian Gatz and Soraya Bornaz. The project aims to make cities more livable by coupling the long-term growth and material accumulation processes of natural plants with digital technologies that can direct this growth towards architectural objectives.
The Winner in the Excellence category was the digital tool Mapple, submitted by Karolina Mosiadz, Henrikki Tenkanen and Rami Piiroinen from the Finnish company by the same name. The solution can help cities in becoming more efficient, green and people-friendly, by offering a better overview and understanding of areas that are being planned.
As a part of the symposium in Copenhagen, The Alexandra Institute and Arup Group developed a large-scale public installation called *25 Questions for Cities*. The mission was to engage people on how decisions around technology in cities should be made, and we were hoping to encourage a more informal and "grass-roots" debate between citizens.
The installation will be a part of this year's Ars Electronica Festival — so please join the debate! For more info and upcoming deadlines: *https://prix.bloxhub.org*

BLOX, The building

Concept Winner: Flora Robotica

Vog.photo

ERROR — The Art of Imperfection

DRIVE. Volkswagen Group Forum, Berlin, Germany

November 17th, 2018 — March 3rd, 2019

In and of itself, an error is neither good nor bad. First of all, for us an error is "merely" a deviation from what we expect. And this is exactly where the artists in our exhibition come into play: they are the ones who often purposely challenge deviations and/or errors. What does it mean, if we're no longer able to recognize the deviation at all? If we can no longer understand that this is an error which we could tolerate or not? To what extent can this error be checked at all in the digital world? But aren't we the ones who ultimately determine the order, rules, values and standards of a society and culture? Proceeding from these central questions, four guiding principles started to crystallize, which will be further illuminated in the context of an error: irritation, order, value and control.

Curated by Manuela Naveau. Exhibition and Communication Design by Letitia Lehner (MOOI Design).
Production Team: Nani Cooper, Benjamin Dewor, Stefan Feichter, Alexander Hinterlassnig, Jens Jech, Karoline Kreißl, Julia Nüsslein, Gustavo Valera.
With: Emanuel Gollob (AT), Attila Csörgő (HU), Georgie Pinn (AU/UK), Stefan Tiefengraber (AT), Prokop Bartoníček (CZ), Benjamin Maus (DE), So Kanno (JP), Yang02 (JP), LarbitsSisters (BE), Anna Ridler (UK), César Escudero Andaluz (ES), Martín Nadal (ES), Mushon Zer-Aviv (IL), Dan Stavy (IL), Eran Weissenstern (IL), Adam Harvey (US), Robertina Šebjanič (SI), Gjino Šutić (HR), Claudia Rohrmoser (AT), Florian Kühnle (DE)

Future in a Nutshell

April 2019 — October/November 2019

KI @ WORK

"...for artificial intelligence becomes much more similar to human intelligence if it is unable to solve the problem of desire. Admittedly, it is not easy to construct a completely neurotic computer."
Umberto Eco, Die Zeit, 1986

Between promise and conspiracy we find ourselves: Artificial intelligence, some think, is the technological revolution that will relieve mankind enormously in the future. AI is celebrated as relief, as assistance, as a guarantor for logical, statistically calculated results that no longer lie within the measuring capacity of a human being. On the other hand, the others are afraid: What about my privacy and civil rights? Who listens to everyone? What happens to my digital shadow and into which systems is it transferred? Where do I participate without knowing it? Who interprets me and directs me in which direction? Are we being given to understand that we can have a say in the course of development?

The intentions behind AI are manifold, but control is virtually non-existent. A general attitude is therefore required. Questions about ethics and accountability must be asked right now.
Future in a Nutshell is a format developed by Greiner Technology & Innovation GmbH together with Ars Electronica Linz. It is intended to provide a unique opportunity to gain an overview of pioneering technologies. Together with proven local experts, we would like to shed light on the topic of KI@WORK from different perspectives and discuss it with knowledge carriers from Greiner in order to prepare each other for it.

Concept: Greiner Technology & Innovation GmbH and Ars Electronica Export

Photo: Michaela Kraus, Greiner AG

Anifilm Trebon Exhibition

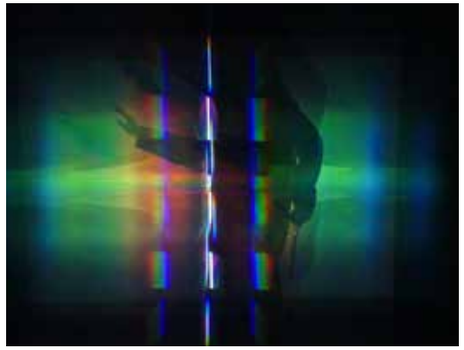
Anifilm, Trebon, Czech Republic

May 7 — 12, 2019

This exhibition prepared by the Ars Electronica curators as part of the Anifilm Festival introduces the work of renowned Salzburg graphic artist and animator Reinhold Bidner, who focuses on animation and electronic media and explores the possibilities of working with time, games and new media arts. He works alone or in collaboration with the Austrian artistic collective "Gold extra." The group "Gold extra" produces artworks that occupy a space in and between fine arts, performance, music and hybrid media. They are engaged in constant research into innovative art forms to create the most compatible formal environment for their ideas.

In the Třeboň chateau gallery, you have a chance to see the videos *Ex Terrat*, *CONfusions, Until We Coleidescape, Impulse* and the documentary-style computer game *The Fallen.*

Rene Volfik



Reinhold Bidner

Until We Caleidoscape

Rene Volfik

Rene Volfik

Ex Terrat

Silicon Valley

Open Austria, San Francisco

Ars Electronica partners with Open Austria and the newly founded *EU National Institutes for Culture Cluster in Silicon Valley* to galvanize a meaningful dialogue between artists and technologists, humanists and the tech industry, and the European Union and Silicon Valley. Open Austria was founded in 2016 as the official Austrian representation and innovation office in Silicon Valley. Since its establishment, there has been a major shift in how societies perceive technological innovation. Growing skepticism, mistrust and fear have led to a global backlash against technology, prompting calls for a closer critique of the techno-utopianism of Silicon Valley. Tech giants are often unable to anticipate the devastating path of destruction some of their most lauded creations can lead to: fake news, election manipulation, tech addiction, bots, polarization, vanity and outragification of society. There is now an urgent global need to address tech regulation and ethical standards for artificial intelligence, and in this moment of increasing tension between society and technology, Open Austria and EUNIC Silicon Valley are at the heart of the global tech industry — Silicon Valley — advocating for digital humanism.

In line with the European Commission's strategy for international cultural relations, EUNIC Silicon Valley aims to leverage Europe's cultural and humanistic heritage to contribute to a critical understanding of technological innovation. *The Grid* is the first initiative of the cluster and will lead to a virtual stakeholder map that visualizes existing and potential partnership models between Big Tech and the arts in the San Francisco Bay Area. As insightful communicators, artists allow us to perceive the challenges facing the world differently by opening up alternative realities. Utopian and dystopian visions of our past, present, and future are imperative to innovation ecosystems, and artists grant us access to these visions. Building upon the data of *The Grid*, the cluster can efficiently position itself and the EU as a mediator between the worlds of art and technology, ensuring there is open access to these alternative realities.

Ars Electronica is an essential strategic partner in this endeavor, and in its partnership with Open Austria will place many distinguished European thinkers and artists at the heart of the global tech industry to respond to some of the most critical questions of our time.

Open Austria, the Austrian Consulate and Innovation Office in Silicon Valley. A joint initiative between the Austrian Ministry of Foreign Affairs and the Austrian Trade Commission.

Jens Vetter's interactive sound sculpture *Netz 2.0* exhibited at the MUTEK.SF Festival 2019 in San Francisco with the support of Open Austria and Ars Electronica. Photos: © Bruno Destombes

“Hyundai Meets Art” Zone

Since 2004, Ars Electronica has worked together with partners in art and culture, science and education, commerce and industry to produce a diverse array of projects all over the world. The spectrum includes exhibitions and presentations, conferences and workshops, performances and interventions. What these collaborative activities have in common is the inspiration they derive from the ideas and visions of Ars Electronica’s worldwide network. We see the collaborative effort as the real spirit of Europe: we share knowledge, we strive to improve together and we promote empathy by trying to see through the eyes of the other.

In the Hyundai Motor Company, Ars Electronica has found an international partner that shares our perspective on society as a place for collaboration and innovation. Hyundai moves between the poles of art, technology and society, knowing that the cooperation with arts and culture stimulates critical and innovative thinking.

Ars Electronica and Hyundai have jointly curated three exhibitions on the theme of “Future Humanity — Our Shared Planet,” which were shown in 2018/19 at the Hyundai Motorstudios in Beijing, Seoul and Moscow. Furthermore, the two partners have successfully collaborated on several projects, all with one common goal: to explore the intersection of art, technology and society. The next big project will be the exhibition *Human (Un)limited*, taking place once again at the Hyundai Motorstudios in Beijing, Seoul and Moscow. It links up thematically with this year’s Festival theme exhibition.

1. ARTISTIC ENDEAVORS

A. VH Award

Hyundai supports and cultivates young, talented media artists in Korea and helps them to gain international recognition. The Award, together with the enormous Vision Hall screen, is a unique media platform, a prototype in its entire constellation and dimension that can only be fully experienced live — similar to an organ in a cathedral. Drawing on longstanding experience with the Prix Ars Electronica, Ars Electronica contributed to the establishment of the Award, with the festival’s senior director Martin Honzik being one of the judges from the very beginning.

The three Grand Prix Winners of the VH Awards, *A Thousand Horizons* (by Dongjoo Seo, 3rd VH Award), *Hear the Wind_Across the Border* (by Hyungkyu Kim, 2nd VH Award) and *A Journey* (by Je Baak, 1st VH Award), are presented in the Hyundai booth in POSTCITY. Additionally, the three winning works of the 3rd VH Award, *A Thousand Horizons* (by Dongjoo Seo, Grand Prix), *Highway like a Shooting Star* (by Youngkak Cho, finalist) and *Black Air* (by Chansook Choi, finalist) will be shown in Ars Electronica’s Deep Space 8k during the festival.

B. Blue Prize

Hyundai’s Blue Prize initiative is a program for young, emerging Chinese curators. Each year, an international as well as national jury selects two outstanding talents out of a rising number of participating curators from all over China. They are seen as a new generation of Chinese curators, being critical natives as well as eyewitnesses of one of the most dynamic and complex macro-economies worldwide.

Ars Electronica has been a part of this competition’s quest since its first edition, by being an active member of the jury, selecting and mentoring the winning projects. The winners receive financial support to create an entire exhibition for the impressive Hyundai Motorstudio in Beijing, located in the city’s legendary art district 798. The topic of the 2018 edition of the Blue Prize was “Future Humanity.” In 2019, it will be “Social Intelligence.”

OS_ ROOMTONE, Kim Dongwook (KR), Jeon Jinkyung (KR), Hyundai

2. ART + TECH

A. VH Award Making Films

These films explore the meaning and possibilities of using technology in art, as well as what the VH Awards can mean for young Korean artists. The judges, including Martin Honzik, speak about their take on the topic.

B. Bloomberg Art + Technology Films

In 2018, Hyundai Motor and Bloomberg announced a three-year partnership with the launch of a new digital video series, ART+TECHNOLOGY. Streamed globally on Bloomberg’s platforms, ART+TECHNOLOGY profiles a line-up of global artists and organizations exploring art and technology in short documentary-style episodes. The series discusses the latest technologies such as artificial intelligence, data, virtual reality and 3D printing in 108 episodes so far. Bringing art and technology to life, the soundtrack for the series is created entirely by artists who use AI technology to compose sound art.

Many of the presented artists have been proposed by Ars Electronica, drawing on the Festival’s worldwide network of media artists.

C. ZER01NE, innovation platform of Hyundai Motor Group

ZER01NE is a creative network platform operating at the intersection of “ART,” “TECH,” and “BIZ.” In 2018, ZER01NE launched its first program, providing support to realize each participant’s creativity to its fullest potential with the appropriate financial reward. Collaborative projects that combine the expertise of startups and the originality of creators generate a synergy that can have a greater social impact. Individual projects by ZER01NE creators illustrate a coexistence of artistic practice and technological advancement.

3. ARTWORKS

Thousand Horizons: SEO Dongjoo (KR)

A Thousand Horizons combines CG and the repetitive page-turning of a book, captured through an unfamiliar perspective. Through the constantly expanding and changing horizontal landscape of the symbolic time of “day,” it explores the digital and analog media’s temporal, spatial, and material properties, metaphorizing human

reason, action, and interaction. It explores the areas between macro — micro, external — internal, conceptual — abstract, real — fantasy, nature — artificial, body — mind, captivating visitors into a synesthetic experience.

***Hear the Wind_Across the Border*: KIM Hyungkyu (KR)**
This "360 degree view through media" extends the viewer's role from passive recipient to neutral onlooker or even to an active observer. Viewers confront a 360-degree view of landscapes seen from Imjingak; Yeonmijeong in Ganghwado; Yongsan redevelopment area; and the site of the Admiral and the historical statue of Soonshin Lee in Gwanghwamun, Seoul, Korea. The artist throws in an underlying question to the viewers, who became independent observers of the visually opposed "South and North," "Generations" and "Individuals and Groups."

***A Journey*: JE BAAK (KR)**
In *A Journey*, the viewers travel around the surrealistic world filled with symbols that are like innocent children's inquiries. The artist transforms the virtual reality in RPG games into a place of contemplation, and allows the viewers to experience the world full of symbolic elements and situations in the perspective of a traveler. By doing so, he poetically expresses the various questions that the viewers encounter during their training in a journey called "life."

***Tribes*: Universal Everything (UK)**
This work by renowned digital art and design collective "Universal Everything" is a study of human behavior on a mass scale, designed for a giant screen. Thousands of tiny people move in sync, forming connections, creating collective patterns on the landscape, and seemingly sharing common goals. It explores autonomy, self-organization and group interrelationships.

***Wilson*: LEE Jangwon (KR) & *OS: ROOMTONE* (KIM Dongwook (KR), JEON Jinkyung (KR))**
What should the future look like when the evolution of operating systems (OS) converges upon a specific form? *Wilson* resembles the sun, which has always been warm, impartial and dependable. As long as we can remember, it has connected man and nature, conducted the rhythm between life and order, but always in the background, much like an operating system. Visitors can interact by moving through the virtual space of the VR-based creation *OS*, containing images of near-future autonomous driving environments.
This work, a collaborative project between ZER01NE, innovation platform of Hyundai Motor Group (HMG), and administrative departments within HMG, was organized by ZER01NE, and is sponsored by Hyundai Motor Group. It has been part of the joint exhibition "Future Humanity" in the Hyundai Motorstudio Seoul in 2018/19, and is currently on show in the Ars Electronica Center.


Wilson, Lee Jangwon (KR), Hyundai

Human (un)limited

Between HUMAN LIMITATIONS and LIMITED HUMANITY

A COLLABORATIVE EXHIBITION SERIES OF
HYUNDAI MOTORSTUDIO and ARS ELECTRONICA

Humanity as a whole and humans as individuals are part of a constantly changing environment. Over time, the ever-changing conditions and the resulting existential challenges have proven to be a gift, leading us time and again to the deepest essence of human beings — the intelligence of survival. On the one hand we possess creative intelligence to build and use instruments and technologies, on the other hand our social intelligence has led us to enter relationships and develop a culture of collaboration — collaboration in various constellations and coalitions: between human and human, between human and animal as well as between humans and their surrounding nature and technologies.


Hiromitsu Murakami

From the domestication of nature (the utilization of fire or our prehistoric partnership with wolves) to its industrialization (including its consequences for mankind, environment and nature)

Whether we are confronted with fundamental existential threats or our inherent longing to outgrow ourselves, we are able to develop strategies and technologies to face and overcome limitations by invariably shifting the boundaries of our possibilities. But where does this lead us?
It could be argued that evolution and everything that evolves is always aligned with its own limits while, at the same time, seeking to overcome them. It is in the nature of things that humanity is constantly confronted with its own limits. But, it is also in the nature of things that any strategies and practices to overcome these limits call into question our definition of humanity. So, we are continually in the process of redefining ourselves and asking the question: Who are we, and who do we want to be?

HUMAN LIMITATIONS — LIMITED HUMANITY

Human Limitations — Limited Humanity thus revolves around this existential field of tension that has to be kept permanently and carefully in balance. *Human (un)limited* tells a story about humanity and its striving for realization and identity in a world it increasingly shapes and influences. We shed light on the status of our relationship to the world and address the connections and relationships formed by humanity with all their consequences. The exhibition gives a hint to the next adaptions of humanity and what being human could imply in the future.

Curatorial Concept by Martin Honzik, Senior Director of Ars Electronica Festival / Prix / Export
2019, Ars Electronica
Text: Martin Honzik

HUMANIZING TECHNOLOGIES — About ART, TECHNOLOGY and SOCIETY

A collaboration of CAFA and ARS ELECTRONICA

Humanity has a timeless longing to invent ways and means to overcome oneself, to outgrow oneself and to change the natural course of things oneself. By virtue of creativity, courage and ingenuity, humanity has been able to direct knowledge and skills towards coming ever closer to these desires and realizing its visions. This is rendered possible by another formative quality which, as a gift, has brought us to our unique status in the hierarchy of nature — the gift of invention and creation. This results in two decisive parameters for the success of the project. The power of imagination, deeply rooted in the DNA of the idea, and the quality of those instruments and technologies to make our goals a reality or get closer to them. So we see ourselves endowed with wonderful talents and experience ourselves indulging in them without restraint — with all our passion, devotion and courage. We find ourselves in a world that is more and more formed and created by ourselves, but which, because of the ingenuity of its instruments and technologies, constantly increases in complexity, making it a permanent challenge to find one's own position.

"In life there is nothing more foolish than inventing." (James Watt, 1736 — 1819)

Why James Watt, who made significant contributions to developing the steam engine (1769), would make this statement, we can only guess. Probably it was just a moment of temporary exhaustion or frustration. Nevertheless, the whole complexity of our quest is inherent in this statement. For as much as we need to fight to preserve qualities such as passion and courage for humanity, and as much as we need them to develop ourselves further, we also need a position that supports us in our own actions through critical reflection, that helps us to think about the situations in which we could find ourselves in the future.

In the exhibition, we look specifically at the last 40 years, approximately the period in which the so-called "Digital Revolution" has sparked a rapid, global dynamic and become one of the central, global challenges for society. While it initially seemed a logical further development of the Industrial Revolution in its orientation towards purpose and efficiency, over time it came to pervade and digitalize the classic industrial model. Today, as a society, we are facing another paradigm shift with regard to our technology and our relationship to it. From automation to its autonomization, it is practically the independence of the digital self. This paradigm shift will not only have an effect on industry, but will also be felt deep in our everyday lives, forcing us to question our concept of being human.

HUMANIZING TECHNOLOGIES

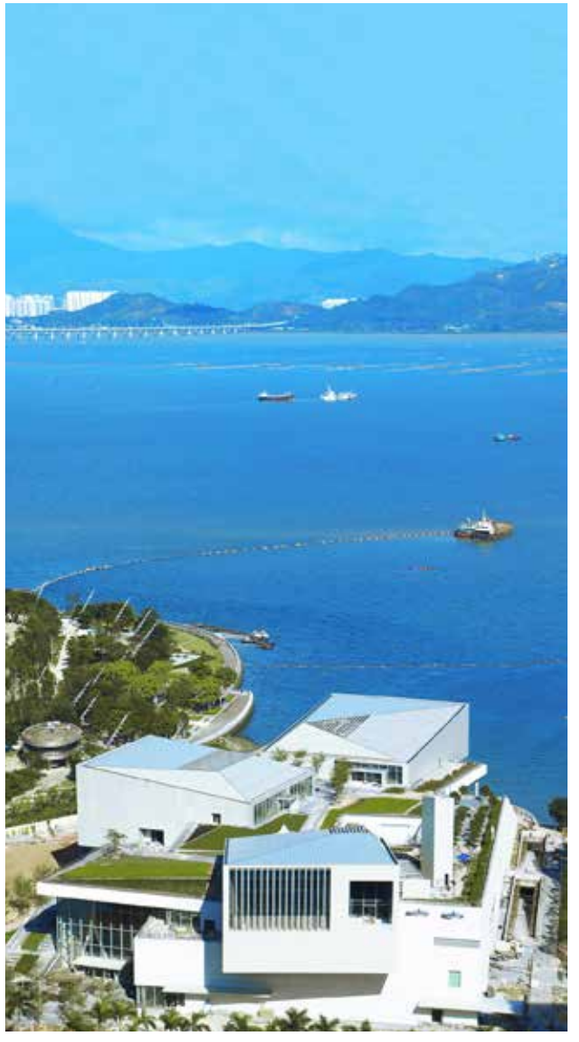
The main focus of the exhibition is on those "species" from the art world — media artists who have been and continue to be permanent critical companions. They were and are capable of positioning "new technologies" in society with their alternative approaches and ways of thinking; with their philosophical farsightedness and their technical ability — far beyond critical, catalytic reflection — to make them accessible and draw new, unexpected connections. The focus is always on the human being, not on technology — *HUMANAZING TECHNOLOGIES*.

In the exhibition, we focus on artistic projects that are capable of establishing direct connections to an increasingly complex environment far beyond the artistic discourse, and which manage to integrate all areas of society through an open, new culture of collaboration. The exhibition should be seen as a tribute to the relationship between art, society and technology. It is shaped by two important positions and institutions in the global field of media art: CAFA, a longstanding driving force in China for budding media artists, and Ars Electronica, one of the world's most important media art institutions, which is celebrating its 40th anniversary.

The Prix Ars Electronica — one of the most important international prizes for media art — has generated an archive of more than 60,000 submitted artistic works from the field of media art.

Every year, Ars Electronica also hosts one of the world's largest and most important media art festivals. Works by international Prix Ars Electronica prize-winners will encounter Chinese artistic positions in media art. Together, they will show how media art intersects with society and what concrete role it plays there.

Text: Martin Honzik
Curator: Martin Honzik, QIU Zhijie
Assistant Curators: JO Wei, Christl Baur
Design Society Team: TANG Siyun, LI Xiaonan, ZHOU Chenchen
Venue: Design Society Shenzhen



Design Society, Sea World Culture and Arts Center Shenzhen

Out of the Box

The Midlife Crisis of the Digital Revolution

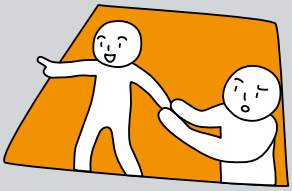
Being a festival for art, technology, and society means using the methods of art and the sensorium of artists to observe and analyze possible future transformations as well as those currently happening, and to come to conclusions about their cultural and social dimensions and their consequences.

The time-honored principle of artistic thought and action “making the invisible visible,” the curiosity to look at what’s behind the scenes and the impulse to make something better, dissatisfaction with simple answers, skepticism toward default solutions, an unflagging creativity in the search for new ways and means — all these are factors, originating in the artistic ecosystem, that are perfectly suited to help formulate the enlightened, critical, and qualified perspectives that we urgently need on our path into the future. A path that must take into account the problems of the present no less than it needs visions of a better future.

448 pages, 585 illustrations

ars.electronica.art/outofthebox

Illustration by Emiko Ogawa



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