



# ROBOTS AND HEALTHCARE PAST, PRESENT, AND FUTURE

COMPILED BY HOWIE BAUM

# What do you think of when you hear the word “robot”?



# Why Robotics?

- **Areas that robots are used:**
  - Industrial robots
  - Military, government and space robots
  - Service robots for home, healthcare, laboratory
- **Why are robots used?**
  - Dangerous tasks or in hazardous environments
  - Repetitive tasks
  - High precision tasks or those requiring high quality
  - Labor savings
- **Control technologies:**
  - Autonomous (self-controlled), tele-operated (remote control)

# A VISUAL GUIDE TO ROBOTS & CYBORGS



Felix "Mecha" Metropolis - 1927

GGRT The Day The Earth Stood Still 1951

Robby Forbidden Planet 1956

Roosie The Jetsons 1962

Astro Boy 1963

Delak Dr. Who & The Daleks 1965

Ro Lost In Space 1965

WAL 2001 - A Space Odyssey 1968

C3PO Star Wars 1977

R2-D2 Star Wars 1977

Todd Buck Rogers In The 23rd Century 1979

V.I.N.Cent The Black Hole 1979

Sulu Clash of the Titans 1981

T-800 The Terminator 1984

Walt Small Wonder 1985

Johnny Five Short Circuit 1985

Tick-Tak Return To Cy 1985

Overbot 2000 Tony Toys 1985

Data Star Trek - The Next Generation 1987

Whooms Batteries Not Included 1989

Bender Futurama 1999

Holy Brain Pop 1999

Astro Honda Corporation 2000

Roomba Robot 2002

Clank Ratchet & Clark 2002

Marvin The Hitchhiker's Guide To The Universe 2005

Robby Copper Bottom Robots 2005

Carl Meet The Robinsons 2007

Norm Phineas and Ferb 2007

Wall-E & Eve Wall-E 2008

CYLON Battlestar Galactica 2004

Sentinel X-Men: Days Of Future Past 2006

Bumblebee Transformers 2007

Aton Red Steel 2011

1987's Robot The Simpsons 2011

Jawg Pacific Rim 2013

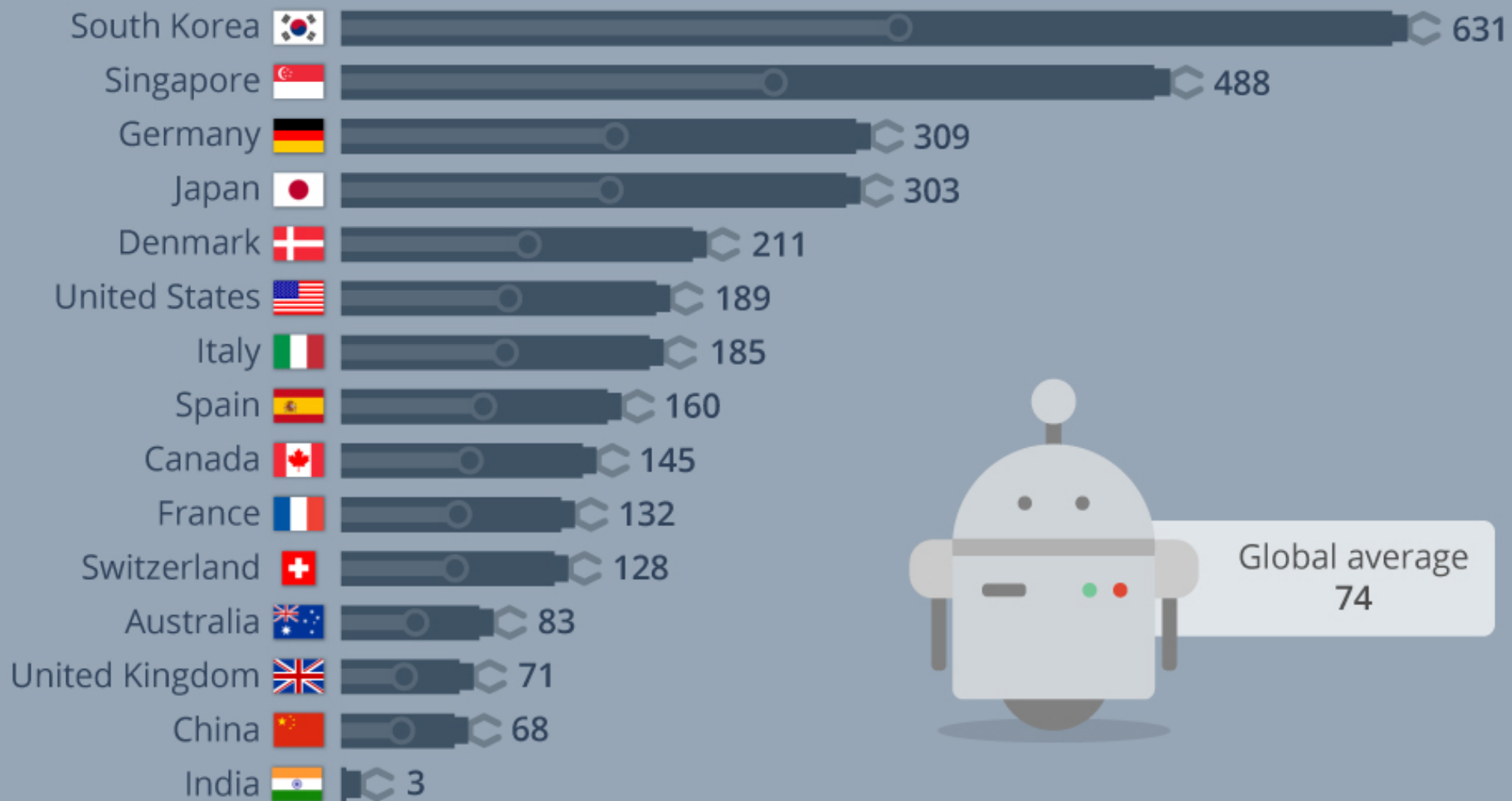
RoboCop 2014

Iron Giant 1999

Favorite robots submitted by fans at [www.facebook.com/sciencebob](http://www.facebook.com/sciencebob)

# The Countries With The Highest Density Of Robot Workers

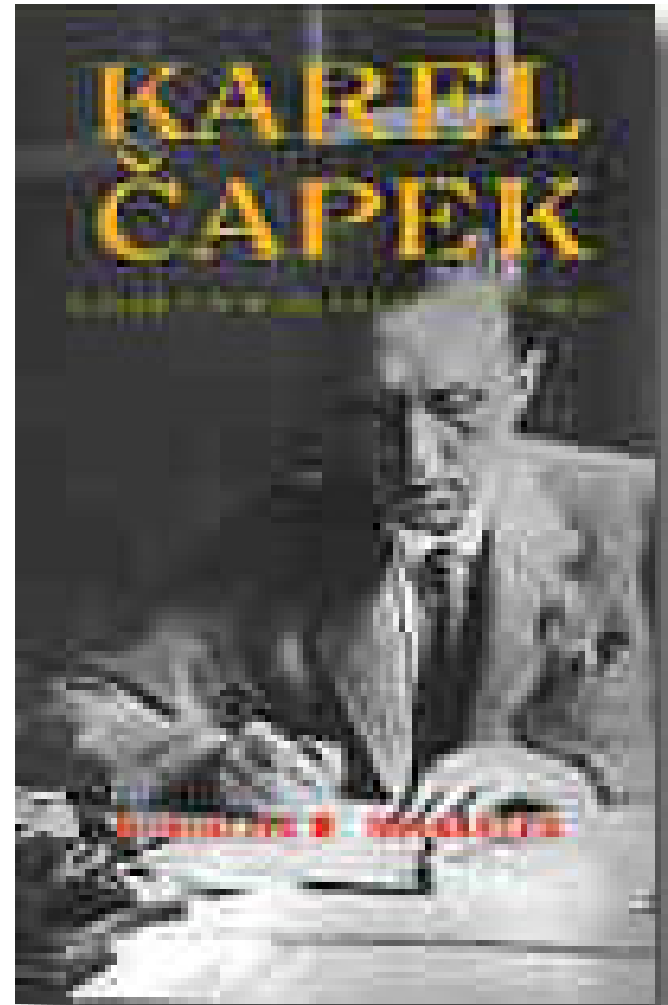
Installed industrial robots per 10,000 employees in the manufacturing industry (2016)\*



➤ The term "robot" was first used in 1920 in a play called "R.U.R." Or "Rossum's universal robots" by the Czech writer Karel Capek.

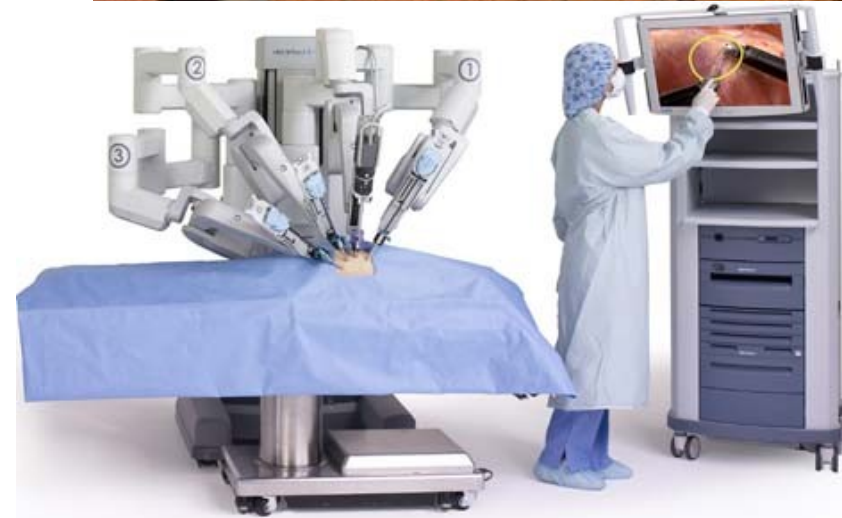
➤ The acclaimed Czech playwright (1890-1938) made the first use of the word from the Czech word "Robota" for forced labor or serf.

Capek was reportedly several times a candidate for the Nobel prize for his works and very influential and prolific as a writer and playwright.



# ROBOTIC APPLICATIONS

- EXPLORATION-
  - Space Missions
  - Robots in the Antarctic
  - Exploring Volcanoes
  - Underwater Exploration
  
- MEDICAL SCIENCE
  - Surgical assistant
  - Health Care
  
- ASSEMBLY- factories
  - Parts Handling
  - Assembly
  - Painting
  - Surveillance
  - Security (bomb disposal, etc)
  - Home help (home sweeping (Roomba), grass cutting, or nursing)



**Isaac Asimov**, famous write of Science Fiction books, proposed his three "**Laws of Robotics**", and he later added a 'zeroth law'.

**Law Zero:** A robot may not injure humanity, or, through inaction, allow humanity to come to harm.

**Law One:** A robot may not injure a human being, or, through inaction, allow a human being to come to harm, unless this would violate a higher order law.

**Law Two:** A robot must obey orders given it by human beings, except where such orders would conflict with a higher order law.

**Law Three:** A robot must protect its own existence as long as such protection does not conflict with a higher order law.



# ROBOTICS TERMINOLOGY

- **Robot** – A mechanical device that performs human tasks, either automatically or by remote control.
- **Robotics** – The study and application of robot technology.
- **Tele-robotics** – A robot that is operated remotely.

# DEFINITION OF A ROBOT

A reprogrammable multi-functional manipulator designed to move material, parts, tools or specialized devices through various programmed motions, for the performance of a variety of tasks.

*Robot Institute of America.*

# AUTOMATONS – THE FIRST EXAMPLE OF ROBOTS

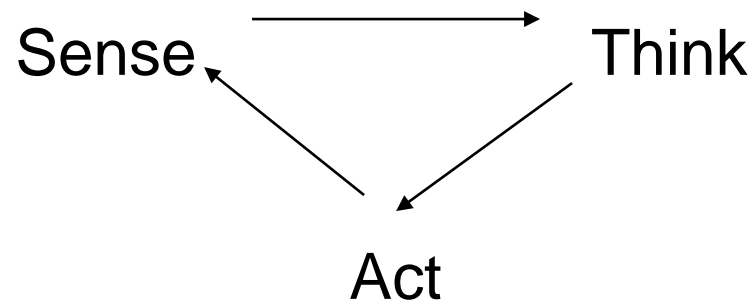
<https://www.youtube.com/watch?v=C7oSfNKIIaM> (2.22 min)



# THE ROBOT CONTROL LOOP

Speech, Vision  
Acceleration,  
Temperature  
Position ,Distance  
Touch, Force  
Magnetic field ,Light  
Sound, or Position

Task planning  
Plan Classification  
Learn  
Process data  
Path planning  
Motion planning



Output information: Move, Speech, Text, Visuals  
Wheels  
Legs, Arms, or Tracks

# TYPES OF ROBOTS

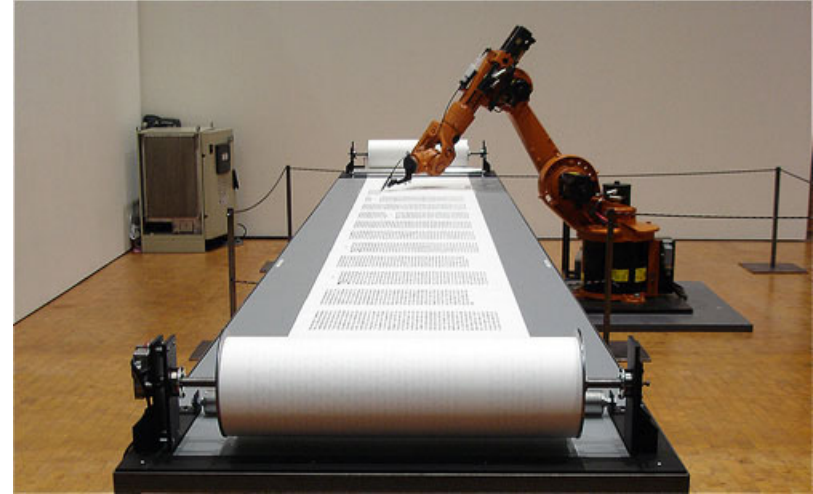
## Industrial Robots –

The most often found robot applications:

[Arc welding](#), [Assembly](#), Coating, Deburring, Die Casting, Molding, Material handling, Picking, Palletizing, Packaging, [Painting](#), [Spot welding](#), Transportation, and in Warehousing

Typical industrial robots do jobs that are difficult, dangerous or dull. They lift heavy objects, paint, handle chemicals, and perform assembly work.

They perform the same job hour after hour, day after day with precision. They don't get tired and they don't make errors associated with fatigue and so are ideally suited to performing repetitive tasks.



# UNIMATE – THE FIRST INDUSTRIAL ROBOT

The first Unimate was installed at a General Motors plant in 1961 to work with heated die-casting machines. In fact most Unimates were sold to extract die castings from die casting machines and to perform spot welding on auto bodies, both tasks being particularly hateful jobs for people. Both applications were commercially successful, i.e., the robots worked reliably and saved money by replacing people

Unimation is still in production today, with robots for sale.



## Mobile Robots-

Robots that move around on legs, tracks or wheels.

A nuclear accident in the USA caused a leak of radioactive material which led to the production of a special robot that can handle those types of materials.



➤ **Educational Robots** – Robotic kits  
Are used extensively in education.  
Eg-Robolab, Lego Mindstorm, and  
RoboCup Soccer



➤ **Domestic Robots** those designed to  
perform household tasks and modern  
toys which are programmed to do  
things like talking, walking and  
dancing, etc.



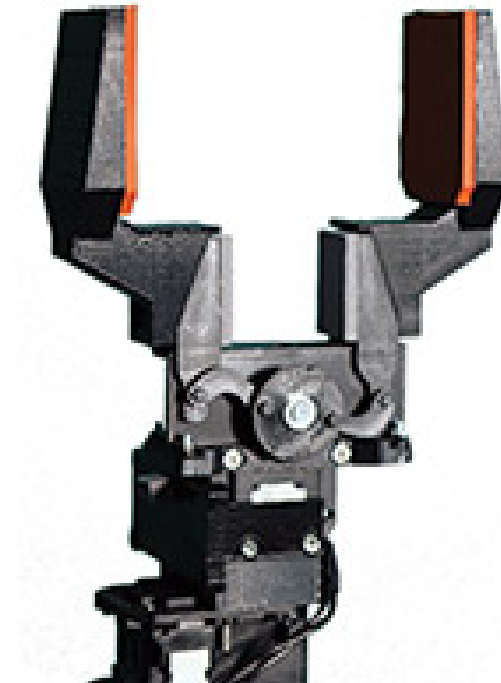


# END EFFECTORS:

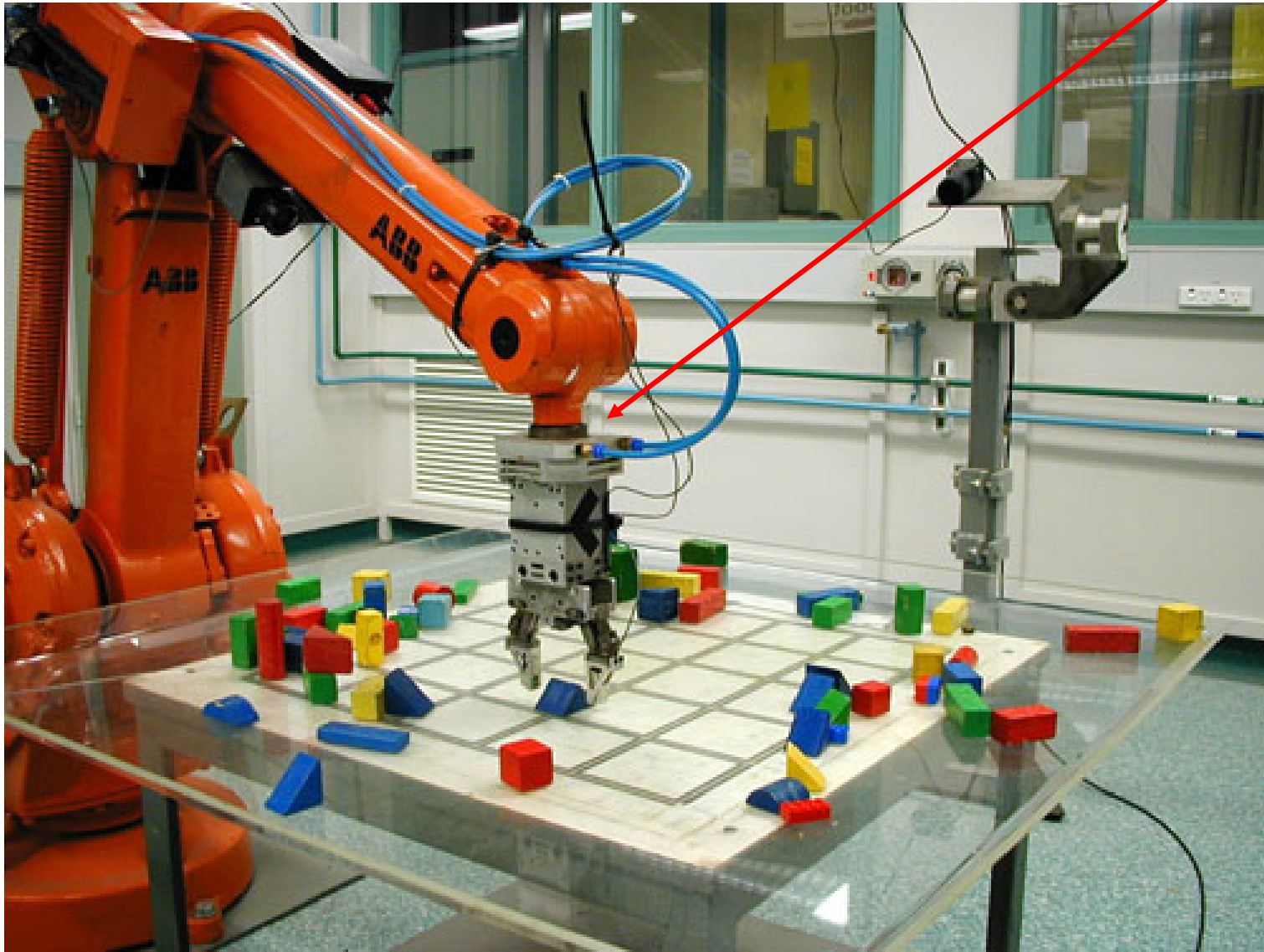
In robotics, an **end effector** is the device at the end of a robotic arm, designed to interact with the environment. The exact nature of this device depends on the application of the robot.

The end effector means the last link (or end) of the robot. At this endpoint the tools are attached, such as grippers or other devices.

In a wider sense, an end effector can be seen as the part of a robot that interacts with the work environment.



Many industrial and other robots use an arm and an “**End Effector**” that can hold a variety of tools or parts and can be rotated through a wide range of angles. The gray colored section at the end of the arm is the “End Effector”



# Applications

- Material Handling/Palletizing
- Machine Loading/Unloading
- Arc/Spot Welding
- Water jet/Laser cutting
- Spray Coating
- Gluing/Sealing
- Investment casting
- Assembly
- Inspection



[https://www.youtube.com/watch?v=MpHglE8661Y&index=29&list=P\\_L3AFB507B668AF162](https://www.youtube.com/watch?v=MpHglE8661Y&index=29&list=P_L3AFB507B668AF162)

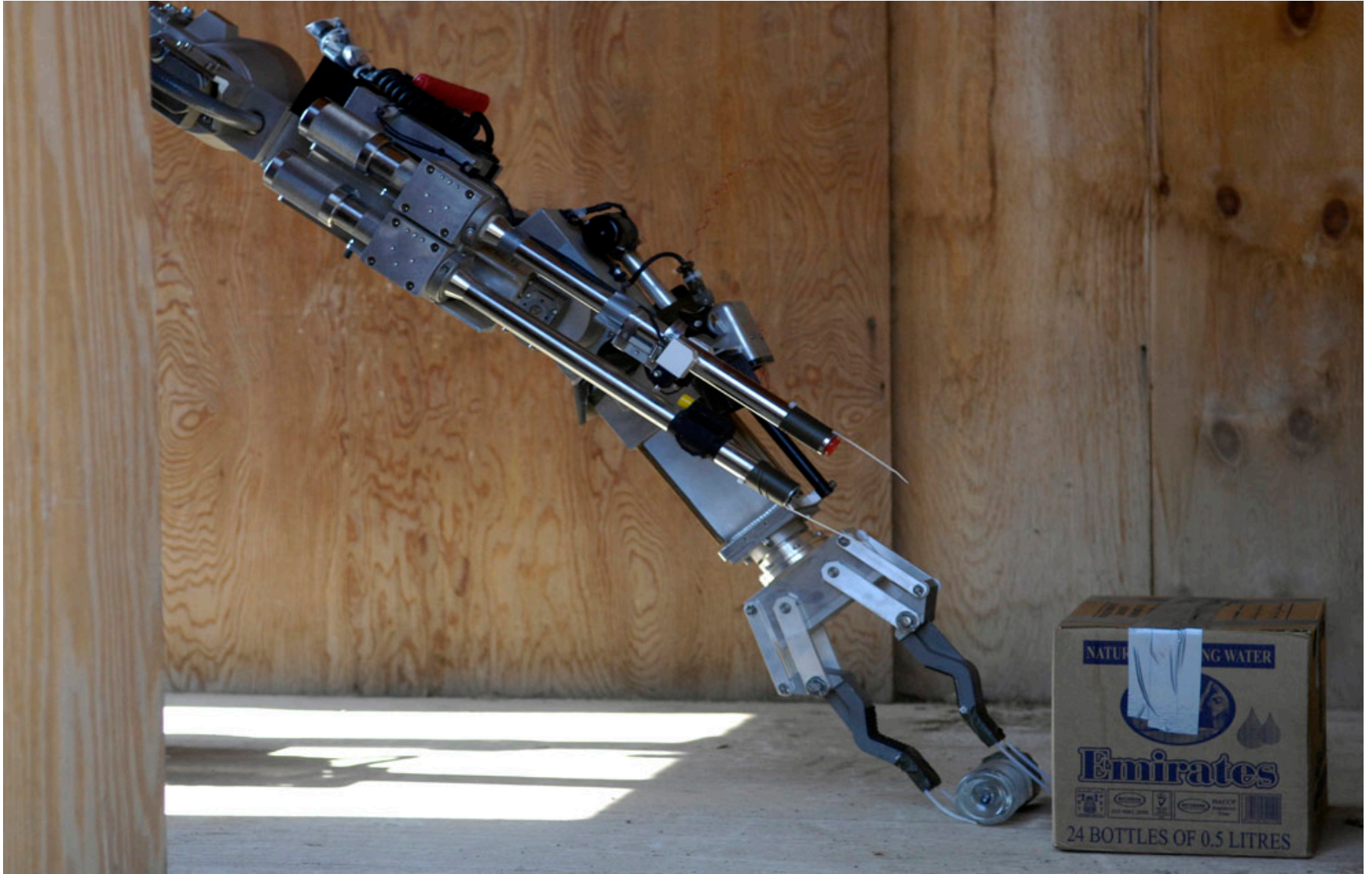
Want to go a step higher and employ a robot to serve tea instead of a pageboy, then get yourself **Asimo**, the walking, childlike robot from Honda Motor Co.

[https://www.youtube.com/watch?v=SARB9OI\\_Wz4](https://www.youtube.com/watch?v=SARB9OI_Wz4)

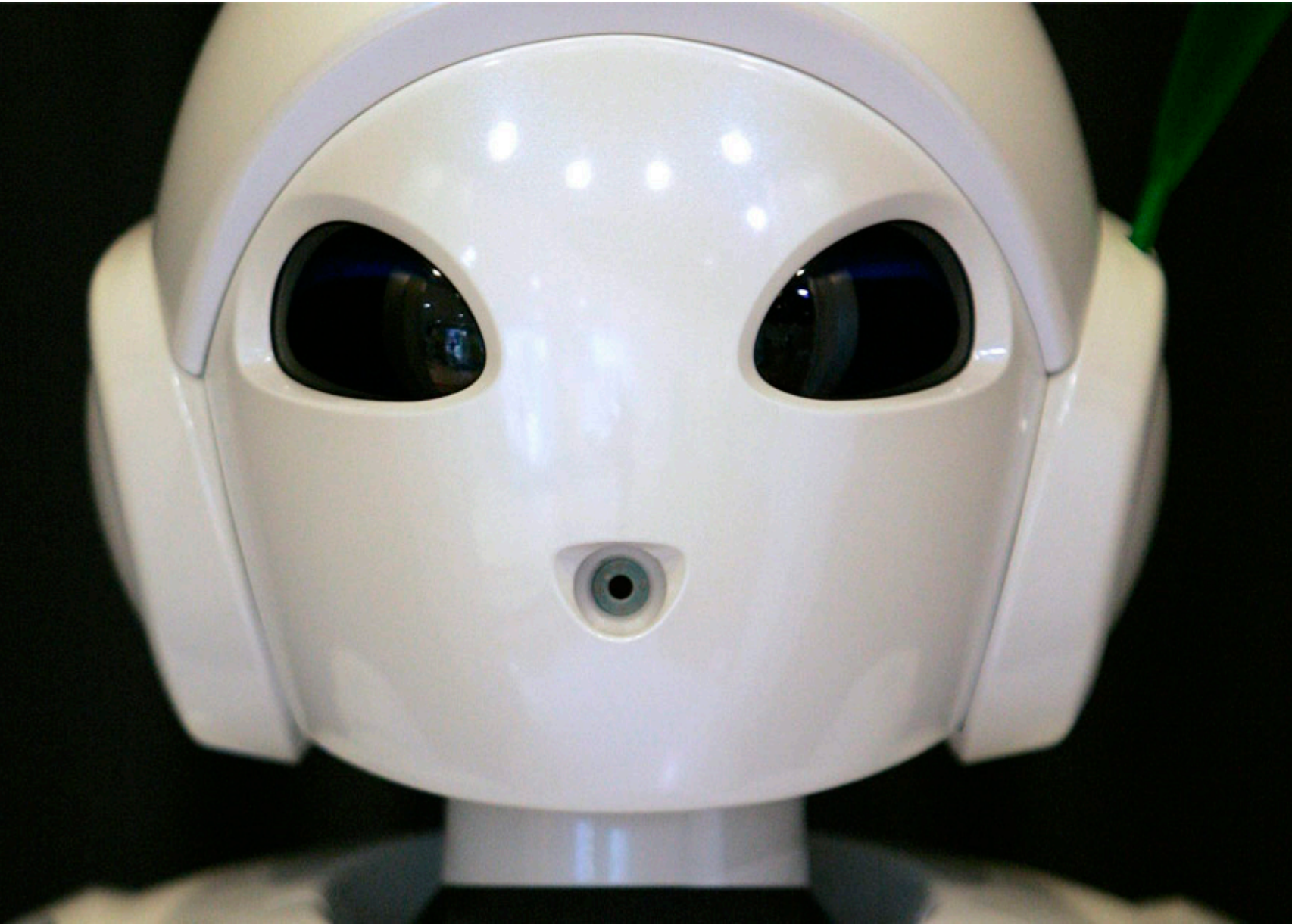


An Explosive Ordnance Disposal robot places an explosive device next to a suspicious package during a demonstration conducted by members of the Special Operations Command Central Command Explosive Ordnance Disposal Unit for participants of the Joint Civilian Orientation Conference 72, at Camp Lemonnier, Djibouti

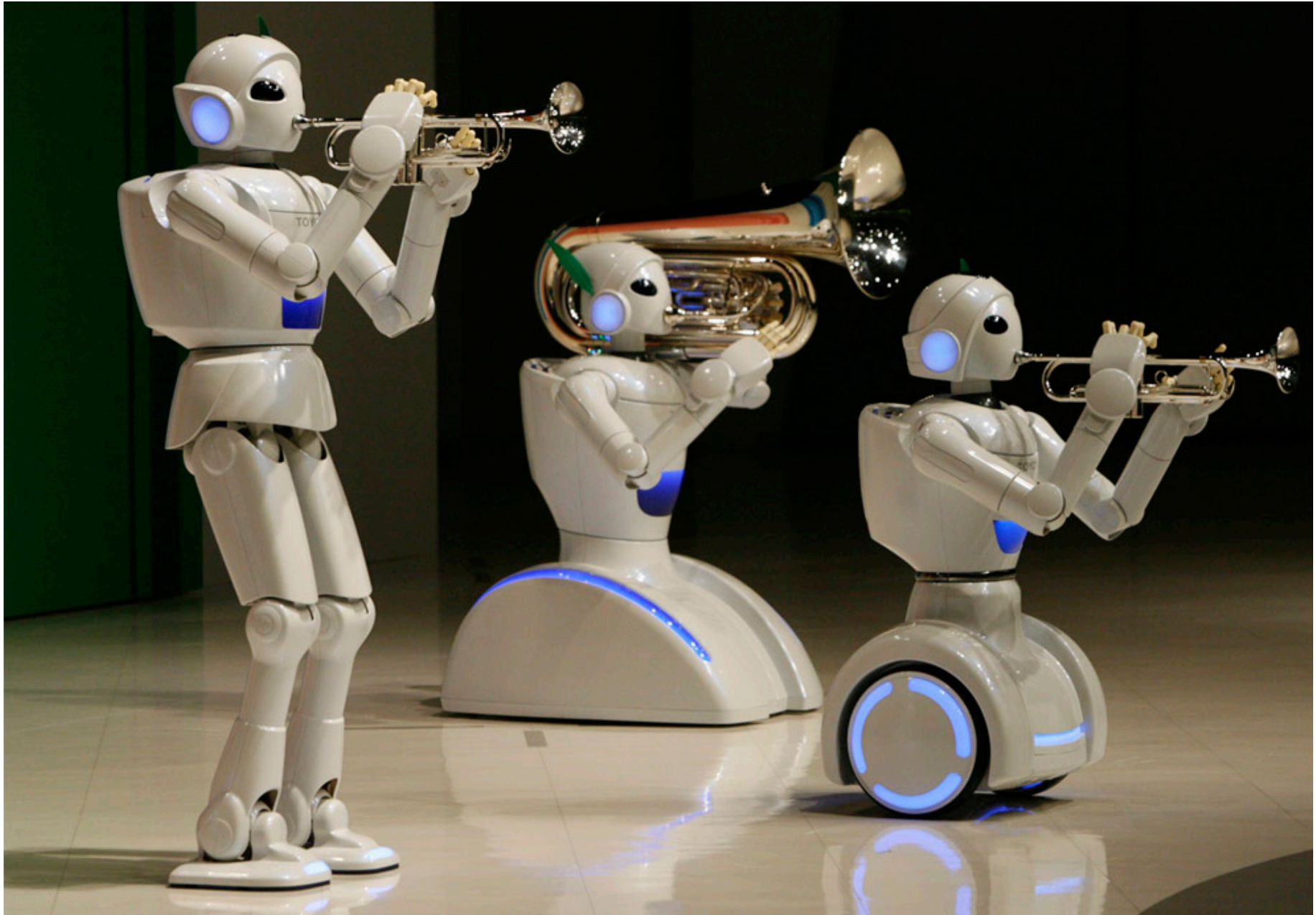
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Toyota Motor Corporation Partner robot is pictured at a showroom in Tokyo



Toyota Motor Corporation partner robots play instruments at the company's showroom in Tokyo.



A mock intruder, tangled in a net that was launched by the remote-controlled security robot T-34, lies on the floor while posing beside the robot in Tokyo. T-34 users can see live images from the robot's camera and control the robot using a mobile phone. The robot, which has sensors that react to body heat and sound, can launch a net against an intruder by remote-control during its surveillance.

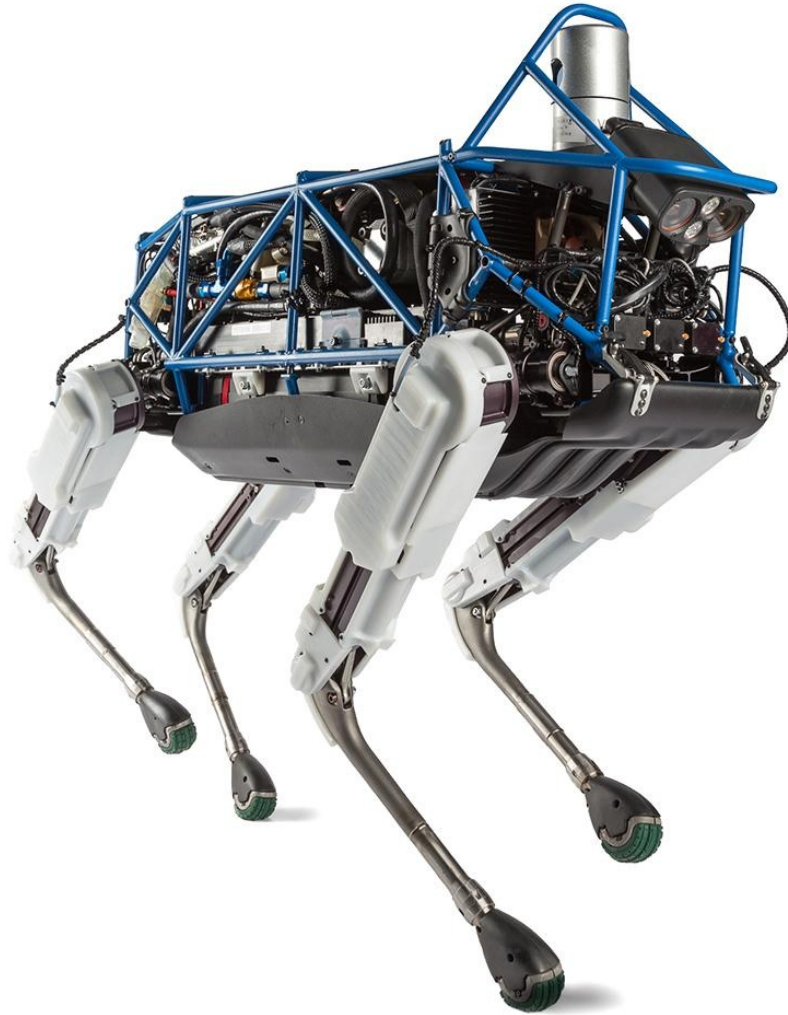




Farmer Wu Yulu drives his rickshaw pulled by a his self-made walking robot near his home in a village at the outskirts of Beijing. This robot is the latest and largest development of hobby inventor Wu, who started to build robots in 1986, made of wire, metal, screws and nails found in rubbish sites.

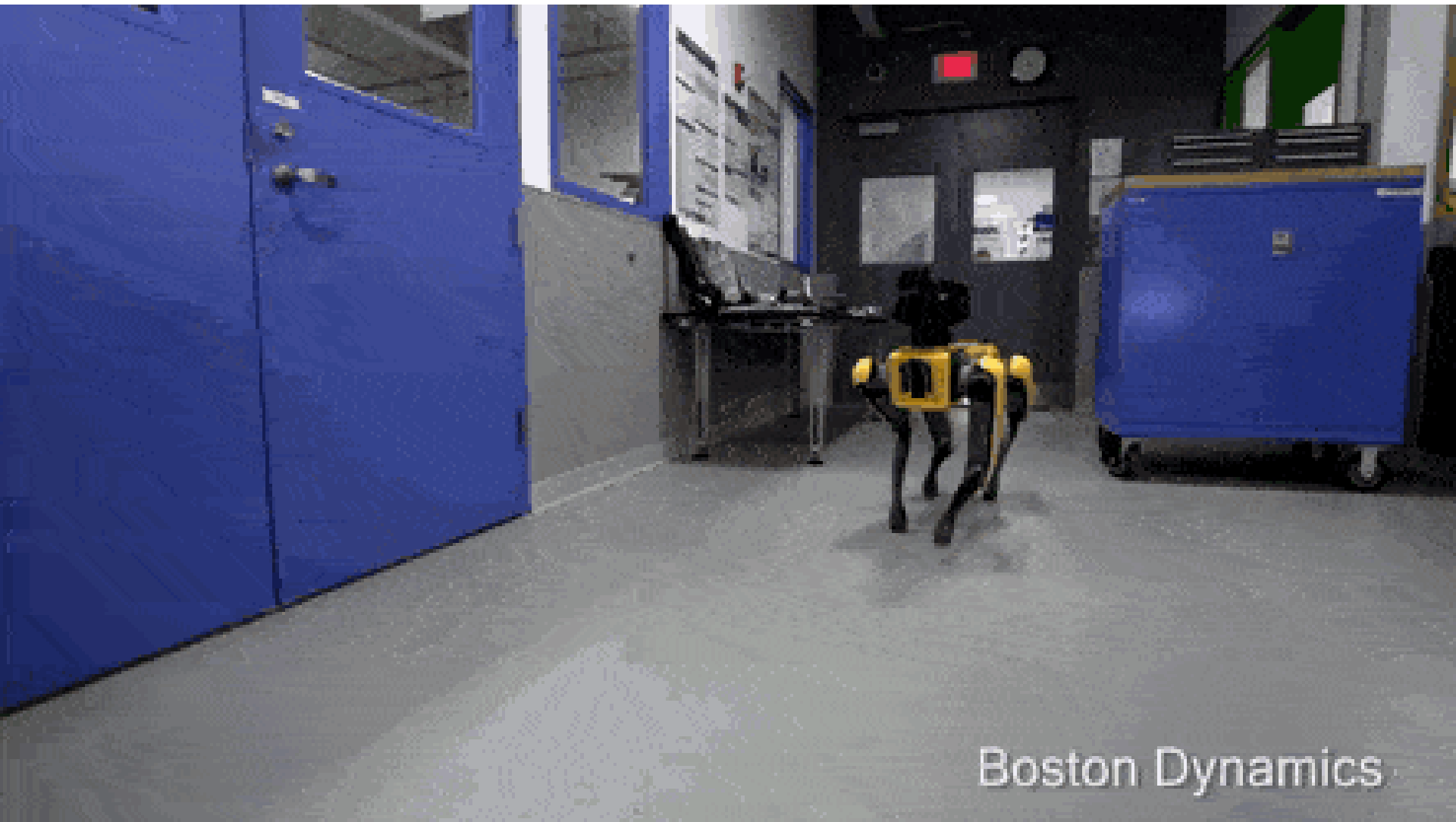


# INTRODUCING "SPOT" THE AMAZING MECHANICAL ROBO DOG



<https://www.youtube.com/watch?v=M8YjvHYbZ9w>

Spot, the Mini Dog, made by Boston Dynamics, can use an extra device to open a door and then find its way through hallways and more



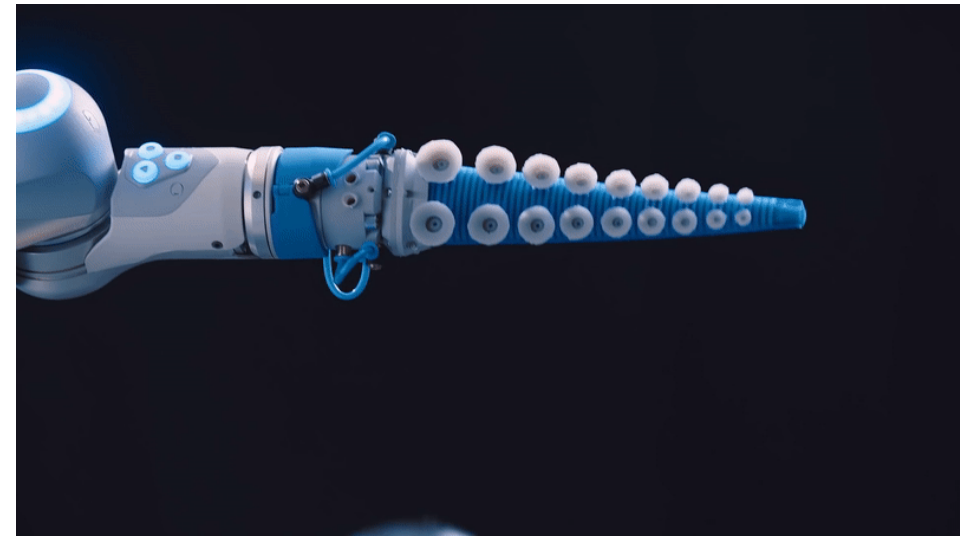
<https://www.youtube.com/watch?v=fUyU3lKzoio>

Fair visitors look at the humanoid robotic system "Rollin' Justin" preparing a tea at the world's biggest high-tech fair CeBIT in Hanover, central Germany.

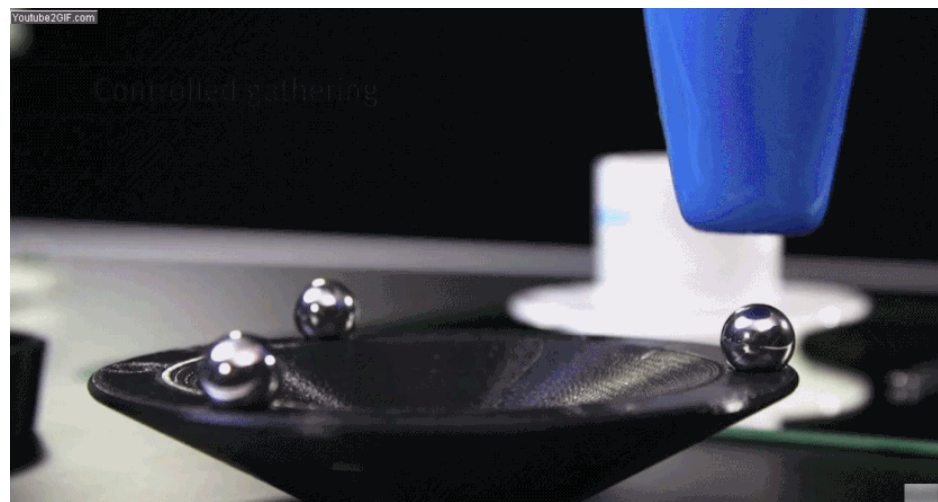
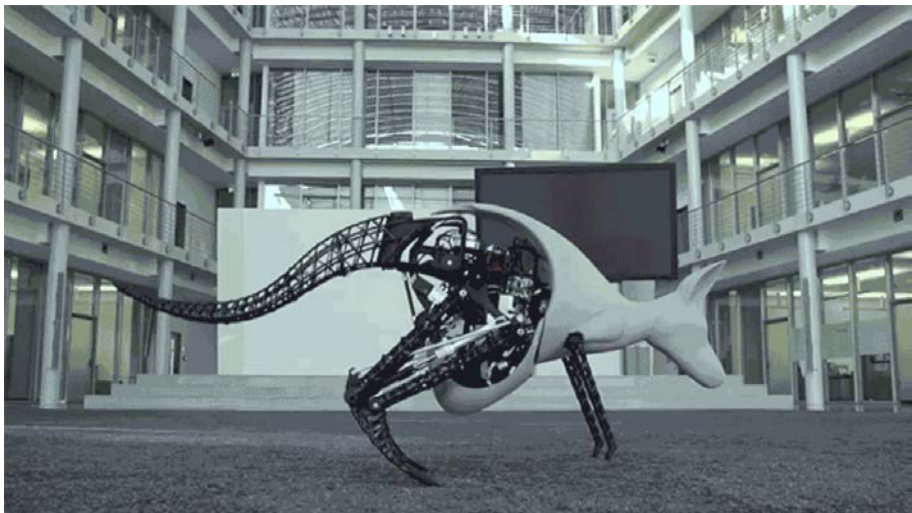


**The Festo company is a manufacturer of very high quality wood and metal working tools.**

**They are also very interested in different types of robots, based on Nature – animals, fish, dragonflies, octopi, and more.**



<https://www.youtube.com/watch?v=ZPUvA98uSj8>

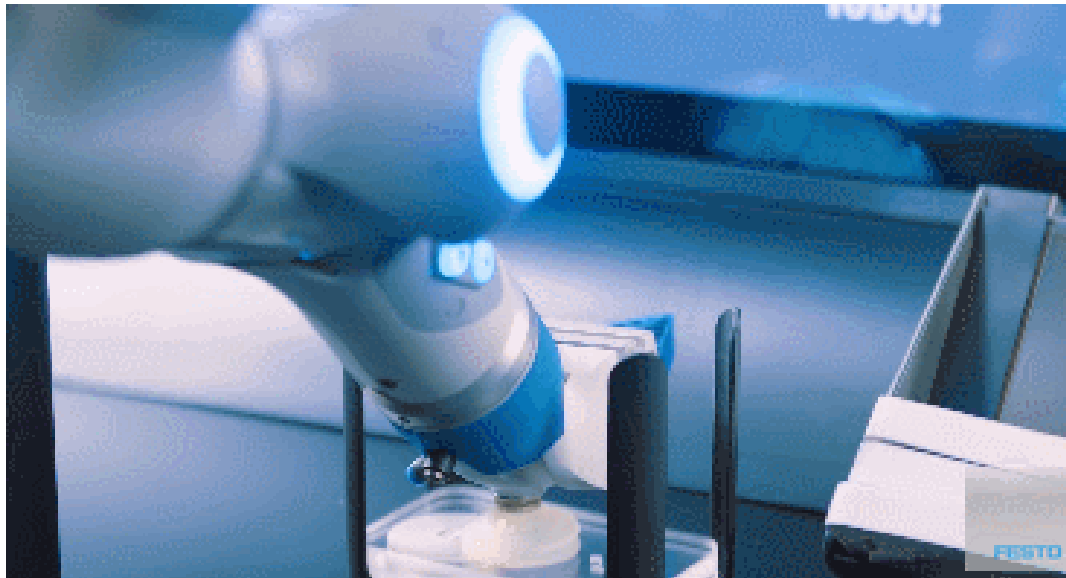


**FESTO BionicCobot - A sensitive helper for human-robot collaboration** - The BionicCobot is based on the human arm not only in terms of its anatomical construction. Like its biological role model, the pneumatic lightweight robot solves many of its tasks with the help of flexible and sensitive movements.

Due to this flexibility, it can work directly and safely together with humans.

### **Pneumatic lightweight robot with human motion dynamics**

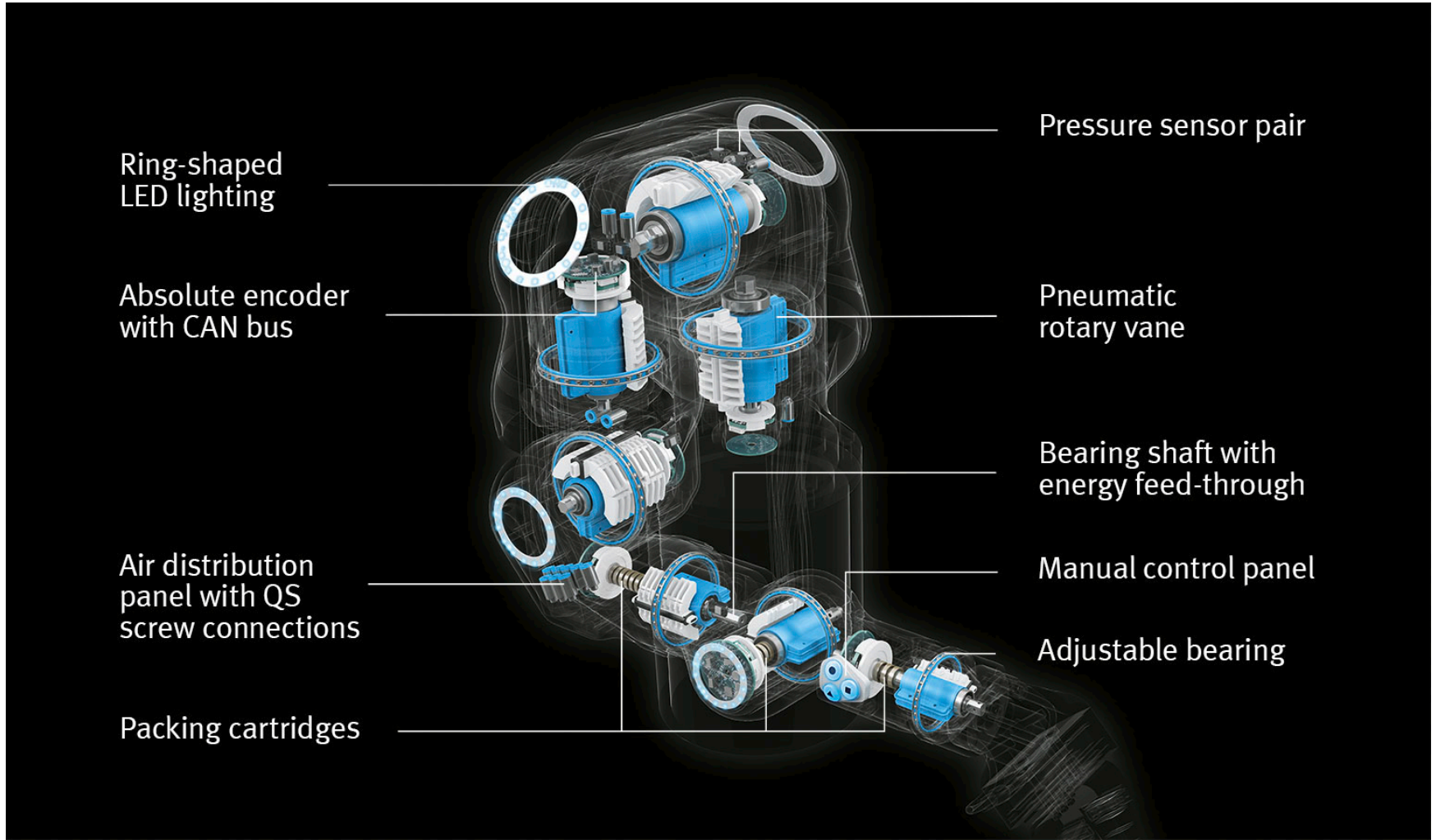
Whether it is gripping powerfully or lifting carefully, pressing firmly or touching gently – for us humans to be able to execute a movement, the interaction of counteracting muscles is always necessary. The developers have technically implemented this principle of agonist (player) and antagonist (opponent) on the BionicCobot in all seven joints.



<https://www.youtube.com/watch?v=54u3H69tcgM>

There are three axes in its shoulder area, one each in the elbow and lower arm plus two axes in the wrist.

In each axis there is a rotary vane with two air chambers. These form a pair of drives, which can be infinitely adjusted like a mechanical spring by filling them with compressed air.





# BETTYBOT WAREHOUSE ROBOT MOVES ITEMS EFFICIENTLY AT AMAZON !!

<https://www.youtube.com/watch?v=8gy5tYVR-28>



## [The Nutcracker performed by Dancing Kiva Order Fulfillment Robots](https://www.youtube.com/watch?v=Vdmtya8emMw)

<https://www.youtube.com/watch?v=Vdmtya8emMw>





## Domestic robots

The Roomba domestic vacuum cleaner robot does a single, menial job. Domestic robots are simple robots dedicated to a single task work in home use. They are used in simple but unwanted jobs, such as vacuum cleaning, floor washing, and lawn mowing.

## Who is Pepper?

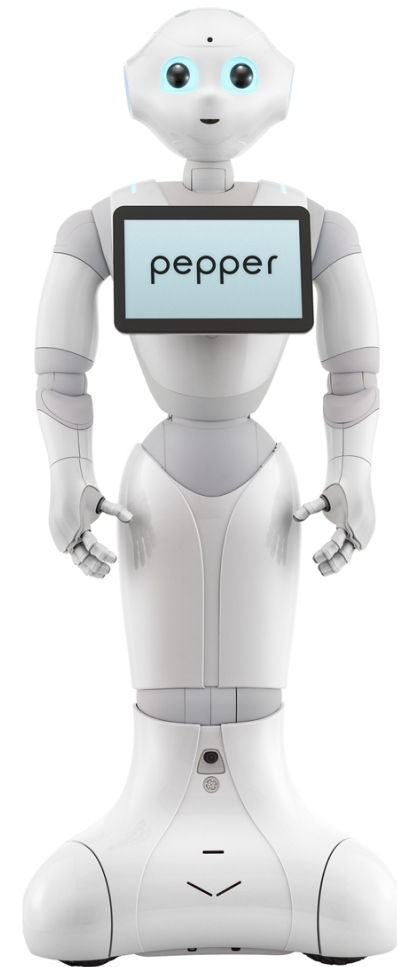
The latest creation from Aldebaran, **Pepper is the first humanoid robot designed to live with humans**. At the risk of disappointing you, he doesn't clean, doesn't cook and doesn't have super powers... Pepper is a social robot able to converse with you, recognize and react to your emotions, move and live autonomously.

Engaging and friendly, Pepper is much more than a robot, he's a companion able to communicate with you through the most intuitive interface we know: voice, touch and emotions.

**Created for SoftBank Mobile**—one of the largest mobile phone operators in Japan- Pepper is already greeting and interacting with customers in stores. It costs around \$1,930.00 and hopefully, the prices should be coming down in the future.

## An emotional companion

He will guess your mood, and will even adapt to it. For example, he will try to cheer you up by playing your favorite song! Pepper also can express emotions, and this is what makes him so cute!



**NAO** is a 58-cm tall humanoid robot. He is small, cute and round. You can't help but love him! NAO is intended to be a friendly companion around the house. **He moves, recognizes you, hears you and even talks to you!**

Since his birth in 2006, he has been constantly **evolving** to please, amuse, understand and love you. In short, to one day become your friend.

Aldebaran created NAO to be a **true daily companion**. He is the little creature who helps you be your best. His humanoid form and extreme interactivity make him really **endearing and loveable**. Currently, it costs \$6,500 which will hopefully go down soon.



<https://www.youtube.com/watch?v=nNbj2G3GmAo>

**A "ROBOT" MACHINE IS MAKING EXCELLENT BURGERS  
WITH YOUR CHOICE OF CHEEZE AND CONDIMENTS,  
IN SAN FRANCISCO !!**



[https://www.youtube.com/watch?v=y0\\_7NrrV8T4](https://www.youtube.com/watch?v=y0_7NrrV8T4)

# ROBOTS IN HEALTHCARE



it can lift the person

# TYPES OF MEDICAL AND HEALTHCARE ROBOTS

## **Surgical robots**

These robots either allow surgical operations to be carried out with greater precision than an unaided human surgeon, or allow remote surgery where a human surgeon is not physically present with the patient.

## **Rehabilitation robots**

This group facilitates and supports the lives of infirm, elderly people, or those with dysfunction of body parts effecting movement. These robots are also used for rehabilitation and related procedures, such as training and therapy.

## **Bio-robots**

A group of robots designed to imitate the cognition of humans and animals.

## **Telepresence robots**

Allow off-site medical professionals to move, look around, communicate, and participate from remote locations.

## **Pharmacy automation**

Robotic systems to dispense oral solids in a retail pharmacy setting or preparing sterile IV admixtures in a hospital pharmacy setting.

**Disinfection robot** has the capability to disinfect a whole room in mere minutes, generally using ultraviolet light technology. They are being used to fight Ebola virus disease.



# THE EXOSKELETON

An Exoskeleton can help us improve or give us better control of our physical capabilities.

Exoskeletons are wearable, powered robot frame devices that people can strap on to walk or lift heavy things, as examples.

We will see wearables better our senses like being able to hear people from across the room, or see things more accurately like binoculars. This will greatly benefit persons who are disabled.



These exoskeleton devices can be separated by type and function/application.

- Mobile rehabilitation exoskeletons
- Fixed rehabilitation exoskeletons
- Powered commercial exoskeletons
- Passive exoskeletons.

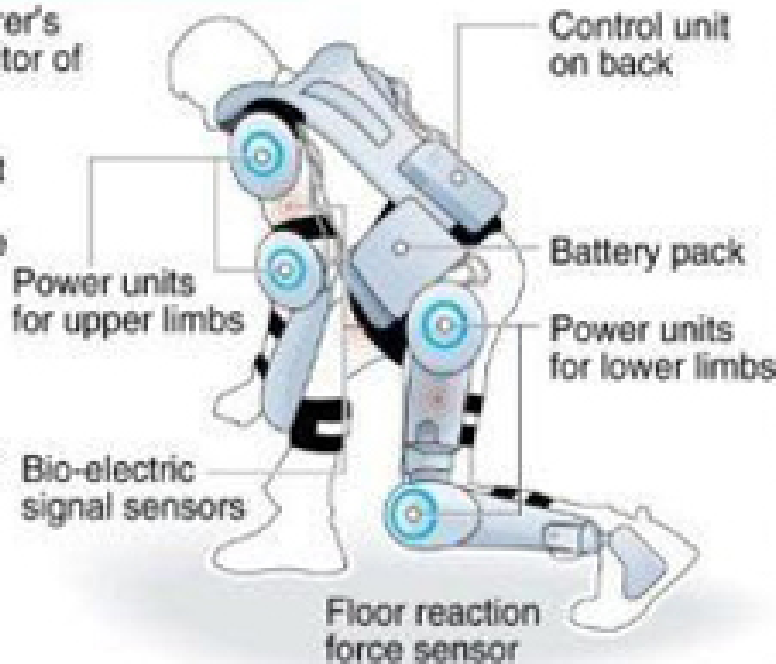


# Robot suit

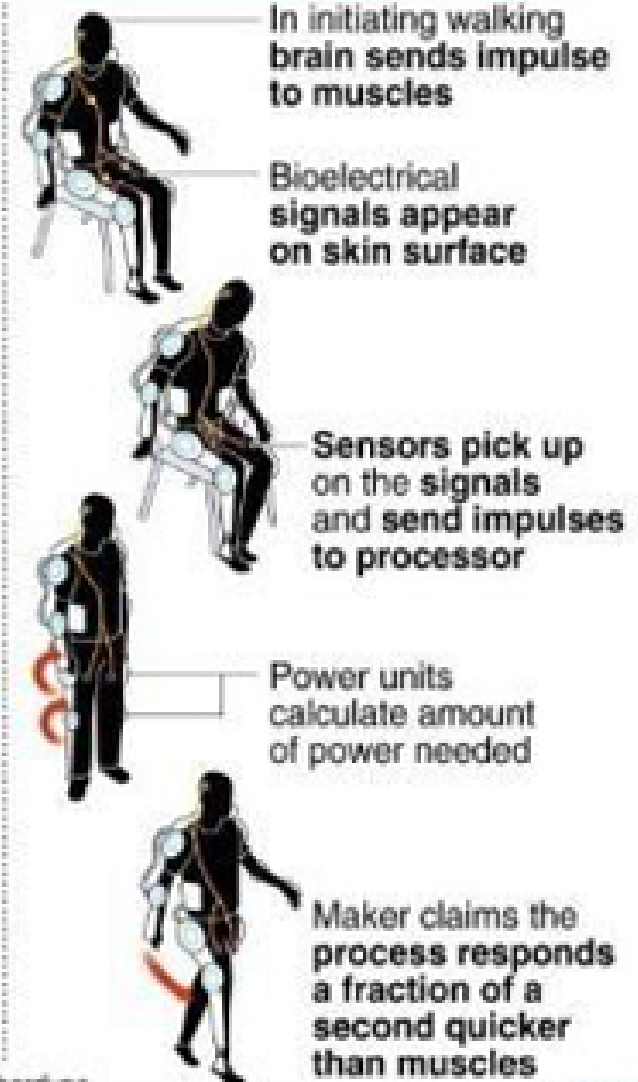
Japanese robot maker Cyberdyne has received a global safety certificate for a bionic suit, paving the way for its worldwide rollout

## HAL-5 Type-B

- Multiplies wearer's strength by factor of 2 to 10
- Sensors detect nerve signals on skin surface to anticipate movement of the wearer
- Joints work in coordination with natural muscle movements



## "Cybermic Voluntary Control"



### Potential uses:

- ▶ Support in medicine
- ▶ Support for manual work
- ▶ Rehabilitation and physical training
- ▶ Disaster relief
- ▶ Support for disabled
- ▶ Entertainment

### Weight

Full body: 23 kg      Continuous operating time:  
Lower body: 15 kg      2 hrs 40 mins

Source: Cyberdyne

## Hybrid Assistive Limb 5 (HAL 5)

Robots play a critical -- and growing -- role in modern medicine:

- Training the next generation of doctors, dentists, and nurses, to comfort and protect elderly patients in the early stages of dementia.
- Using robots, medical professionals can make smaller incisions for shorter surgeries, reducing hospital stays and improving patients' prognoses and saving costs.
- Medical schools are turning to robots that mimic live patients' feelings of pain or discomfort, to help the next wave of doctors and dentists prepare to treat real people.



<https://www.youtube.com/watch?v=QjRrnwiP-8E>

Spanish Queen Sofia and King Juan Carlos, Japan's Emperor Akihito and Empress Michiko react after watching a performance of a robotic suit called HAL (Hybrid Assistive Limb), which can lift up to 30kg rice bags, at Tsukuba University north of Tokyo.



**ReWalk” by ReWalk Robotics** is a mobile lower body exoskeleton for walking assist and/or walking rehabilitation, and potentially a replacement to the wheel chair.

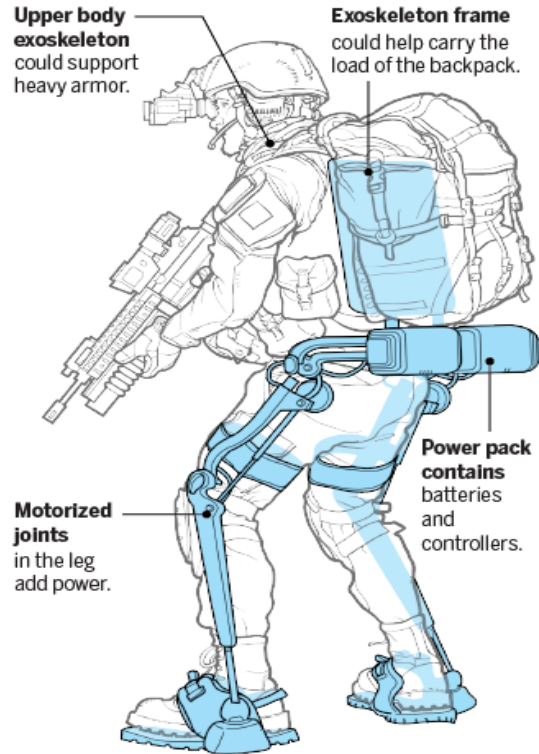


# Giving soldiers a robotic boost

The U.S. military, and others around the world, are trying to build exoskeletons to enhance soldiers' strength and stamina. Several designs are in development.

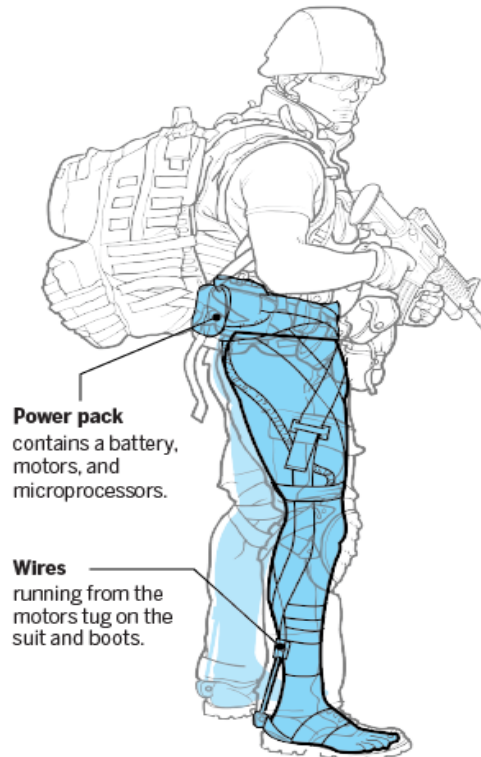
## Rigid exoskeleton

A rigid frame with motorized joints could greatly boost strength and load capacity.



## Soft exoskeleton

Fabric, often stretchy, is mated with cables and small motors to deliver a modest assist.



## Advantages and disadvantages



- Can take weight off the soldier, enabling the user to carry heavy equipment.



- Heavy, and locks users into particular joint movements. Current designs suffer from slow response.
- Uses a lot of power.
- Exhausting to wear and has not shown to boost performance.



- Lightweight, energy efficient, and easy to wear. May boost performance.



- Doesn't take weight off the soldier, limiting extra load.
- Current design isn't tuned to handle running or walking over uneven ground.

<https://www.youtube.com/watch?v=p2W23ysgWKI>

# TYPES OF ROBOTIC SURGERY PROCEDURES

As more surgeons are trained on robotic surgery systems, the list of procedures will continue to grow.

[Gynecologic Procedures](#) - 7

[Urologic Procedures](#) – 7

[General Surgery Procedures](#) - 6

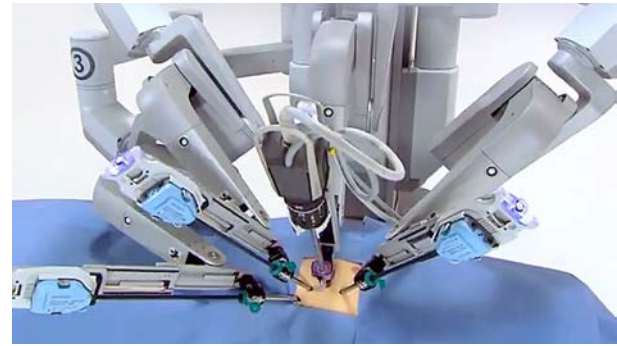
[Thoracic Procedures](#) - 2

[Hepatobiliary \(liver, gall bladder and bile ducts\)](#) - 2



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**Telepresence robots:** allow off-site medical professionals to move, look around, communicate, and participate from remote locations.



**Pharmacy automation:** robotic systems to dispense oral solids in a retail pharmacy setting or preparing sterile IV admixtures in a hospital pharmacy setting.



**Companion robot:** has the capability to engage emotionally with users keeping them company and alerting if there is a problem with their health.

**Disinfection robot:** has the capability to disinfect a whole room in mere minutes, generally using pulsed ultraviolet light. As one important use, they are being used to fight the Ebola virus disease.



**MOBILE ROBOTS:** You may never think about it, but transporting supplies, meals and other materials around the hospital is a drag on efficiency. One estimate shows that a typical 200-bed hospital moves meals, linens, lab samples, waste and other items the equivalent of 53 miles per day.

Enter **TUG, an autonomous mobile robot developed by Aethon Inc.** to ferry supplies to where they are needed, freeing employees from heavy physical loads and allowing them to focus on patient care.

They are programmed with the hospital's floor plan and are also equipped with a variety of sensors to ensure they don't run into anything on their way to the lab. They also kindly ask people to stand aside as they move into congested hallways.



<https://www.youtube.com/watch?v=MLZMAW9lqXE>

Kathy Hutchinson has been paralyzed from her neck down, for many years. Here, she controls a robot arm with her brain to move a bottle of coffee to her mouth.



<https://www.youtube.com/watch?v=D6CCpfE2NoQ>

# THERE ARE 13 MAJOR BRANDS OF ROBOTIC SURGERY UNITS ON THE MARKET TODAY



# THE MAIN TYPES OF ROBOTIC OPERATING SYSTEMS

## Da Vinci Si HD Surgical System

The **Intuitive Surgical** company developed the **da Vinci robotic system** to perform minimally invasive surgeries through superior visualization, enhanced dexterity, greater precision, and ergonomic comfort. With incisions of only 1 or 2 centimeters, surgeons can perform even complex procedures such as open-heart surgery. The system reduces hospital stays by half, reducing costs by about one-third, because of less pain and speedier recovery, according to the company.



[https://www.youtube.com/watch?time\\_continue=5&v=-XRFe0nupM8](https://www.youtube.com/watch?time_continue=5&v=-XRFe0nupM8)

[https://www.youtube.com/watch?v=f\\_H6M3apKm0](https://www.youtube.com/watch?v=f_H6M3apKm0)

Surgeons use the Da Vinci operating “robot” to help with a hernia operation, at the University Hospital Geneva, in Geneva, Switzerland.



## Nursebot

The aging population, coupled with advances in medicine that enable people to overcome once deadly conditions, have created a nursing shortage.

To help combat this situation, researchers at the University of Pittsburgh, the University of Michigan, and Carnegie Mellon University have been working on **mobile robots that are designed specifically to help elderly people cope with day-to-day activities. This allows them to live at home, reducing strains on infrastructure and costs of nursing homes and rehab centers.**

Some robots are equipped with tele-presence capabilities, allowing live nurses or doctors to monitor medical conditions.





The **Vasteras Giraff** is a mobile communication tool that enables the elderly to communicate with the outside world.

It's remote controlled, and it has wheels, a camera and a monitor.

Essentially, the Giraff is a robot that provides two-way video calling similar to Skype. A caregiver can control the robot using a typical PC.

To date, 42 Giraff robots have been delivered to seven European countries, and 20 more were recently built.



Earlier in 2012, robotics firm iRobot built an emerging technologies group and announced a partnership with InTouch Health to put its AVA telepresence technology to better use.

As a result, the two companies developed the **Remote Presence Virtual + Independent Telemedicine Assistant, or RP-VITA**, which combines iRobot's AVA telepresence units with InTouch health's distance education tools, creating a system that allows physicians to care for patients remotely.

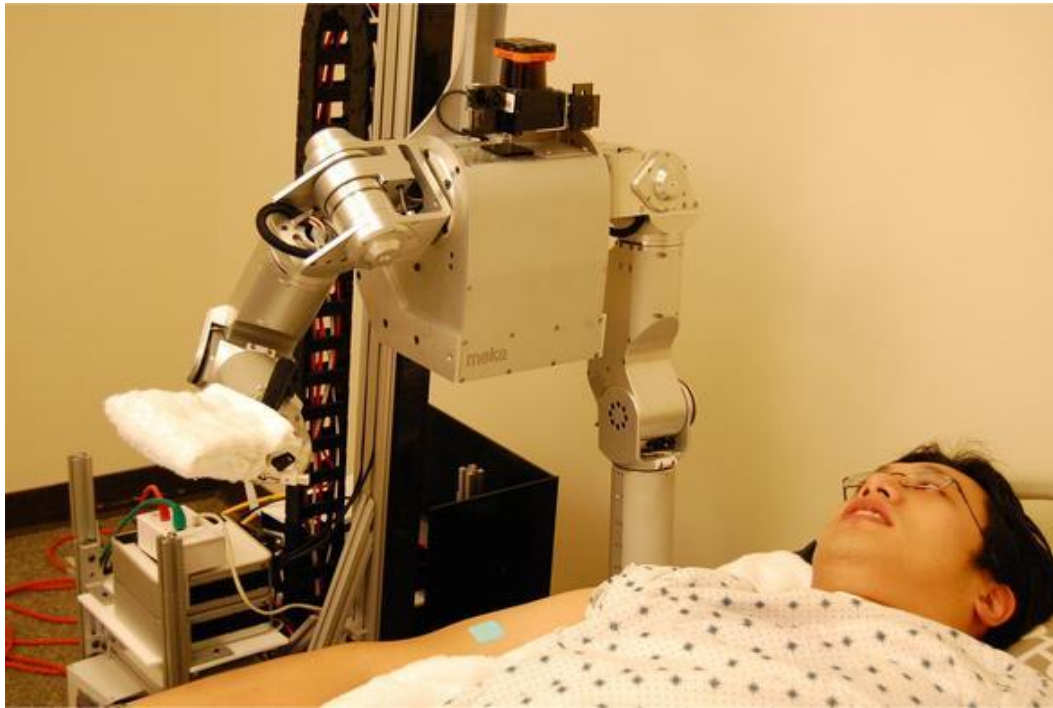
The system features mapping and obstacle detection, as well as avoidance technology and an iPad user interface for control and interaction. The robot can also interface with diagnostic devices and electronic medical records (EMR) systems.



Healthcare Robotics' Nursing Assistant uses a direct physical interface (DPI) that lets a nurse have direct control over the movement of the robot, a "human-scale" mobile manipulator called **Cody**.

Using the DPI, the nurse is able to lead and position Cody by making direct contact with its "body." When the user grabs and moves either of the robot's end effectors -- or the black rubber balls attached to the robot -- Cody responds.

For example, pulling forward or pushing backward make the robot do the same, and moving the end effector to the right or the left causes the robot to rotate. Users can also grab Cody's arm and abduct or adduct it at the shoulder, causing Cody to move sideways.



CosmoBot, is part of a phenomenon called robotic therapy.

Doctors use CosmoBot to enhance the therapy of developmentally disabled children between 5 and 12 years old.

Using the robot can make therapy more interesting for children and allows for better success when achieving long-term therapy goals.

The company designed CosmoBot to collect data on a child's performance. This allows therapists to evaluate how successful the therapy is.



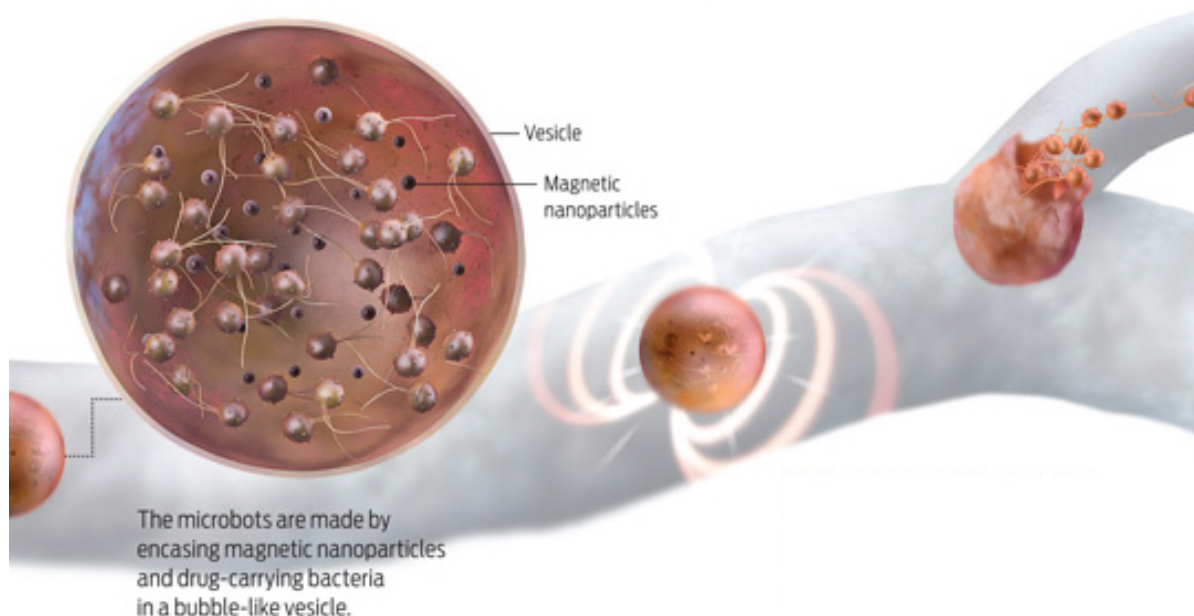
Several scientists and researchers around the world are manufacturing “microbots” -- an assortment of free-roaming robots that carry out precise, delicate tasks inside the human body.

For example, a minibot named Steerable Surgeons is made of flat nickel parts assembled to make a 3-D tool that can be used during retinal surgeries, in drug therapy and for ocular disease. Its power sources are external electromagnetic coils, and it uses magnetic field gradients as a steering mechanism.

## FANTASTIC VOYAGE

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One of cancer therapy's holy grails is the delivery of drugs directly to tumors, thereby killing diseased cells while sparing healthy ones. A promising solution may be to deploy armies of carefully engineered microbot-bacteria hybrids in the body. The submarine-like bots could power through fast currents in large blood vessels, transporting their drug-packing bacteria cargo to the network of tiny vessels that lead inside a tumor.



Anybots was founded in 2001 and performs robot research and development.

Within healthcare, AnyBots provides a type of immersive telepresence, meaning instead of focusing merely on audio and video communications, the AnyBots robot allows for movement controlled by a remote.

"If you're a doctor and have to manage 10 different nursing homes ... the robot can go in, and the doctor can control his movement and direction," said Shahid Shah, health IT analyst.

"It can turn on sensors at the control of not the person in the room, but the person who wants to do the communication," he said. Shah said this type of tele-presence is impressive since it can move in and out of a specific area and record findings.



The Swisslog RoboCourier is an autonomous mobile robot.

The tool dispatches and delivers specimens, medications and supplies throughout the hospital, according to the company.

Once the robot is carrying what needs to be delivered, a person identifies the destination and the robot selects the most efficient route to deliver the materials.

Unlike other conveying systems, the robot can navigate throughout specific environments without lines, beacons, reflectors, magnets or tape, since each robot is guided by an electronic map that plans the best route to the selected destination. The robot uses laser detection to ensure precise and safe navigation, while voice-activated messages alert staff of the robot's presence.



Just last year, Toyota announced four robots made to help paralyzed patients walk or balance themselves.

Pictured is one of the four robots, the **Balance Training Assist**.

The robot acts as a two-wheeled balancing game.

The machine displays one of three sports games on a monitor and requires the patient to make moves in the game by shifting his/her weight on the robot.





Japan's Health Minister Yoichi Masuzoe sits with an assistive robot called "My Spoon" during a demonstration of health care robots in Tokyo. "My Spoon", developed by Japan's Secom is designed to help disabled people eat meals with joystick for controls using one's jaw, hand and feet.



**Bestic** is a small robotic arm with a spoon on the end. The arm can be easily maneuvered, and a user can independently control the spoon's movement on a plate to choose what and when to eat.

The robot has a "unique design" that fits on tables and can also be adjusted for each user by choosing buttons, a joystick, a foot control or another control device they prefer.



Mental commitment robotic baby seals named "Paro" are recharged at robot exhibition Robo Japan. The 350,000 yen (US\$3,480) Paro, a cooing baby harp seal robot fitted with sensors beneath its fur and whiskers, is developed by Japan's Intelligent System Co, to soothe patients in hospitals and nursing homes



## RIBA II

With the face of a friendly teddy bear and the arm-power of a forklift, RIBA -- Robot for Interactive Body Assistance -- is designed to lift people who are too weak or ill to sit, walk, or stand by themselves.

There are 454 sensors built into it's arms, along with a motor for lifting people, and a soft urethane foam skin for comfort.

The robot responds to commands, and is trained to recognize both faces and voices, according to its developers. Prospective markets could include nursing homes, long- and short-term care facilities, and hospitals, especially when the robot is able to lift heavier weights.



<https://www.youtube.com/watch?v=J3edDaPSdY4>

## Remote Presence RP-7

InTouch Technologies focuses on remote presence telehealth solutions, including its Remote Presence RP-7 robot, a full-featured remote presence platform for multiple medical specialties.

Hamot Medical Center in Erie, Pa., for example, uses the RP-7 robot to connect four rural hospital systems and improves patient care in remote areas of northwestern Pennsylvania, western New York, and eastern Ohio, and to support the cardiology services it provides to 14 prisons in the state. The robot-based solution has increased collaboration, enhanced patient care and built relationships among medical professionals, according to the hospital, which estimated about 90% of patients have not been to the hospital.



Image Courtesy of InTouch Health

[https://www.youtube.com/watch?v=qRx7Cds\\_eGsQ](https://www.youtube.com/watch?v=qRx7Cds_eGsQ)

## IntelliFill I.V. Pharmacy Robot

Solutions such as IntelliFill by Baxa are designed to automate hospital pharmacies' intravenous drug preparation process. It uses bar code scanning, vision systems, and weight confirmation steps to identify final products to reduce medication errors. The robot-based system promotes long-term hospital cost savings by preparing the final intravenous products in a syringe instead of an IV bag.



Tokyo Fire Department's rescue robot transfers a mock victim onto itself during an anti-terrorism exercise in the response to a radiological dispersal device in Tokyo, on November 7, 2008. Tokyo Metropolitan government conducted the exercise with eleven organizations including Metropolitan Police Department.



OOPS, HEY, WE ALMOST FORGOT THE  
HUMOR WITH ROBOTS !!







# CAT DRESSED AS A SHARK AND ON A ROOMBA, ENTERTAINS A BABY



TALKING ROBOT HEAD WITH SOME GOOD SMARTS TOO !!

<https://www.youtube.com/watch?v=dcwoH6Qfi9g>



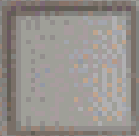


[A MAN BUILT THIS LARGE ROBOT WITH A SENSE OF HUMOR, CALLED ODIN WHICH IT TOOK HIM 800 HOURS TO BUILD](https://www.youtube.com/watch?v=tYN_fL6s2QU)  
[https://www.youtube.com/watch?v=tYN\\_fL6s2QU](https://www.youtube.com/watch?v=tYN_fL6s2QU)

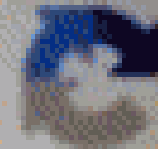


## R2 - D2

So vulgar they beeped out every single word he said



I'm not a robot

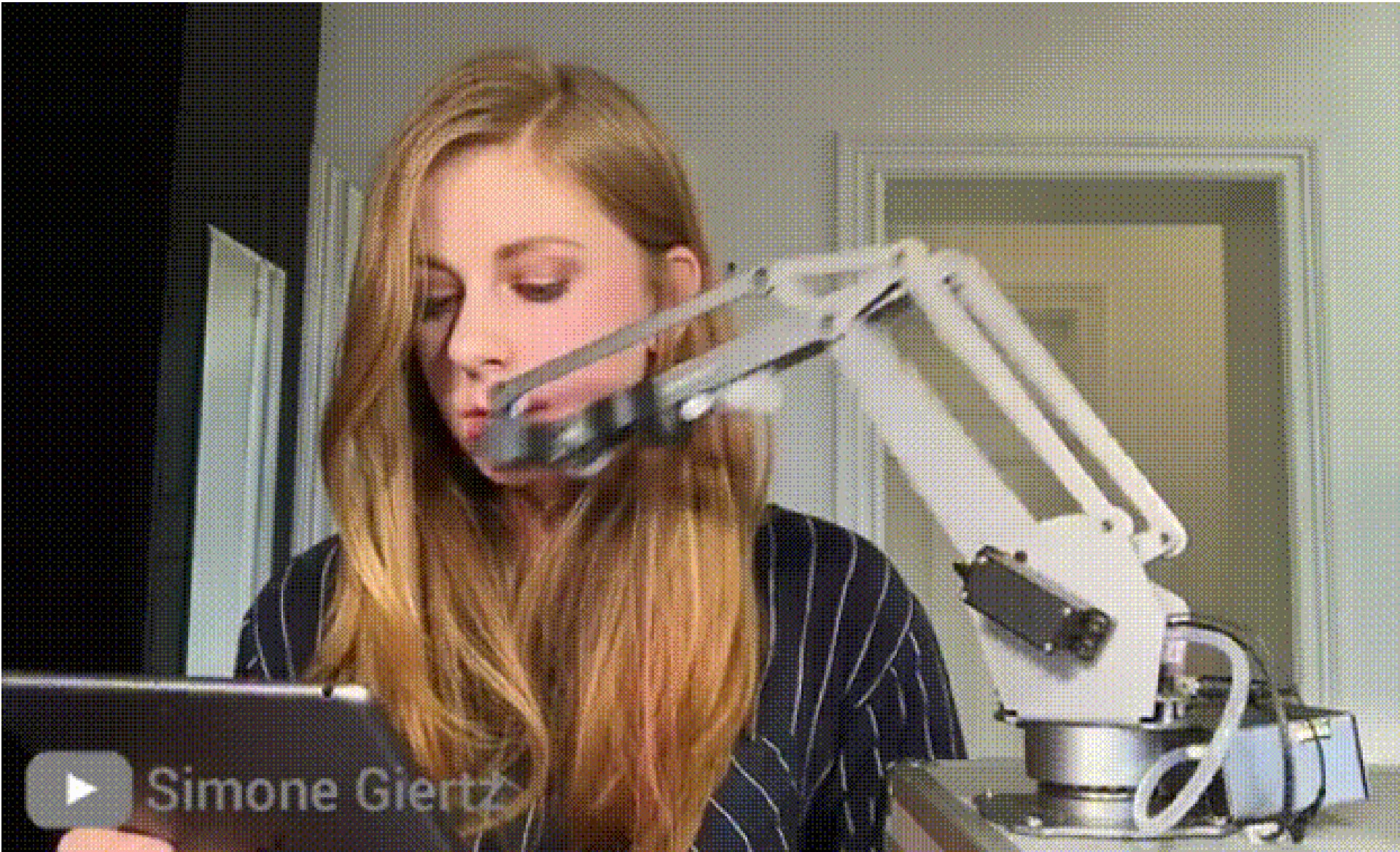


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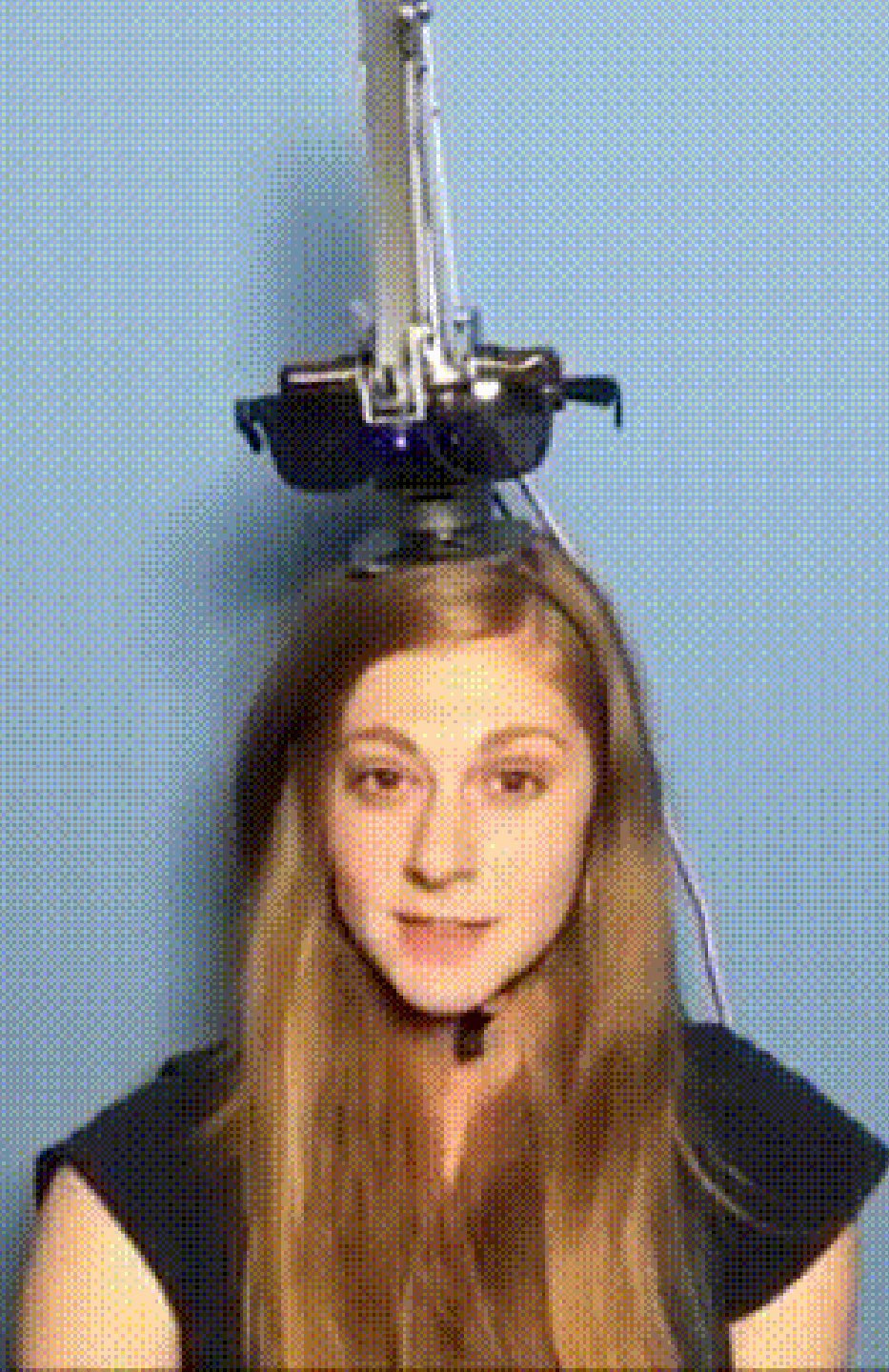
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Click here to generate direct link



▶ Simone Giertz

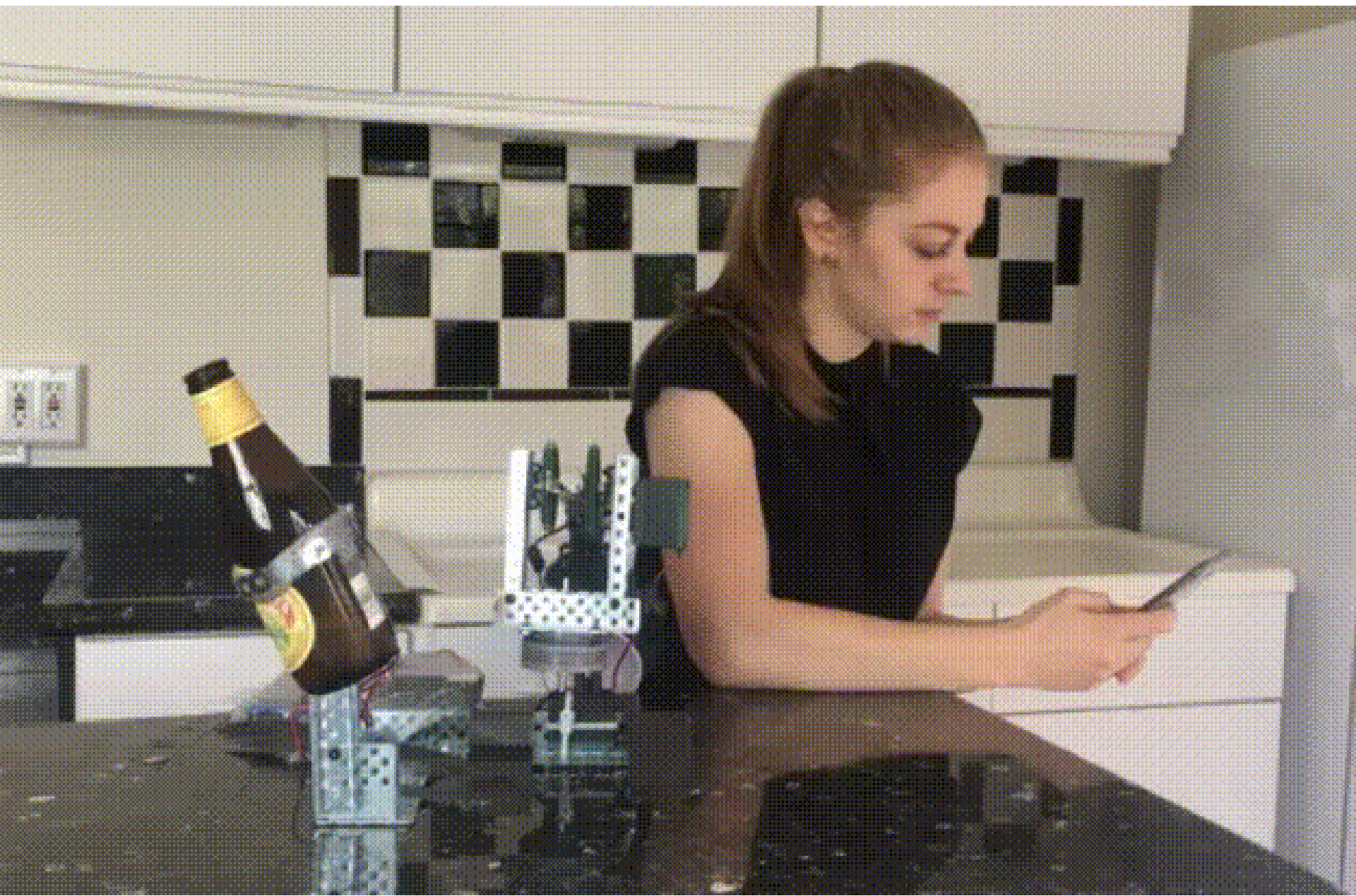


















WALL-E ROBOT DOING SOME COOL MOVES !!

<https://www.youtube.com/watch?v=UWnWVuuvuX0>





# Thank You !!

