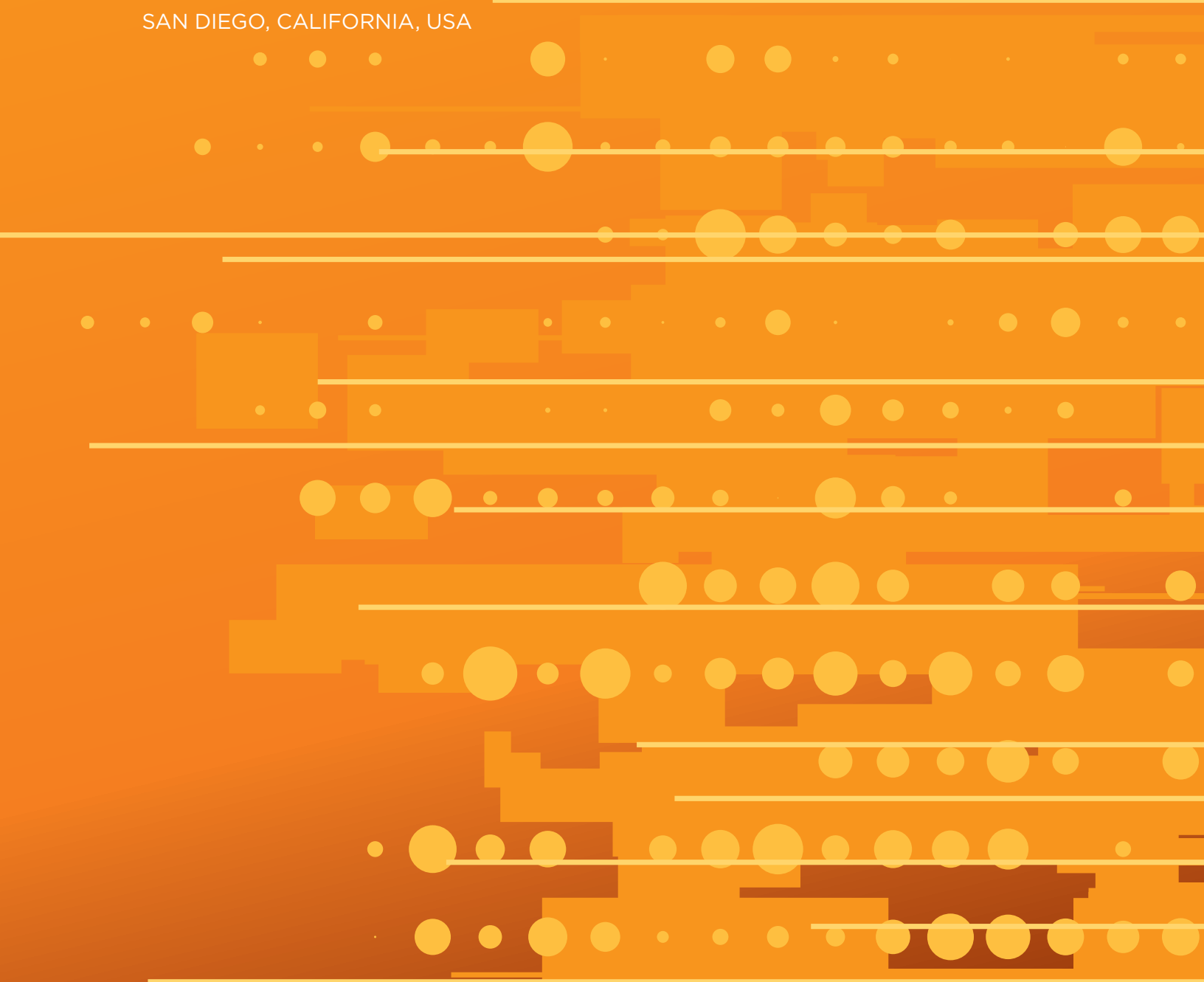# SPIE.

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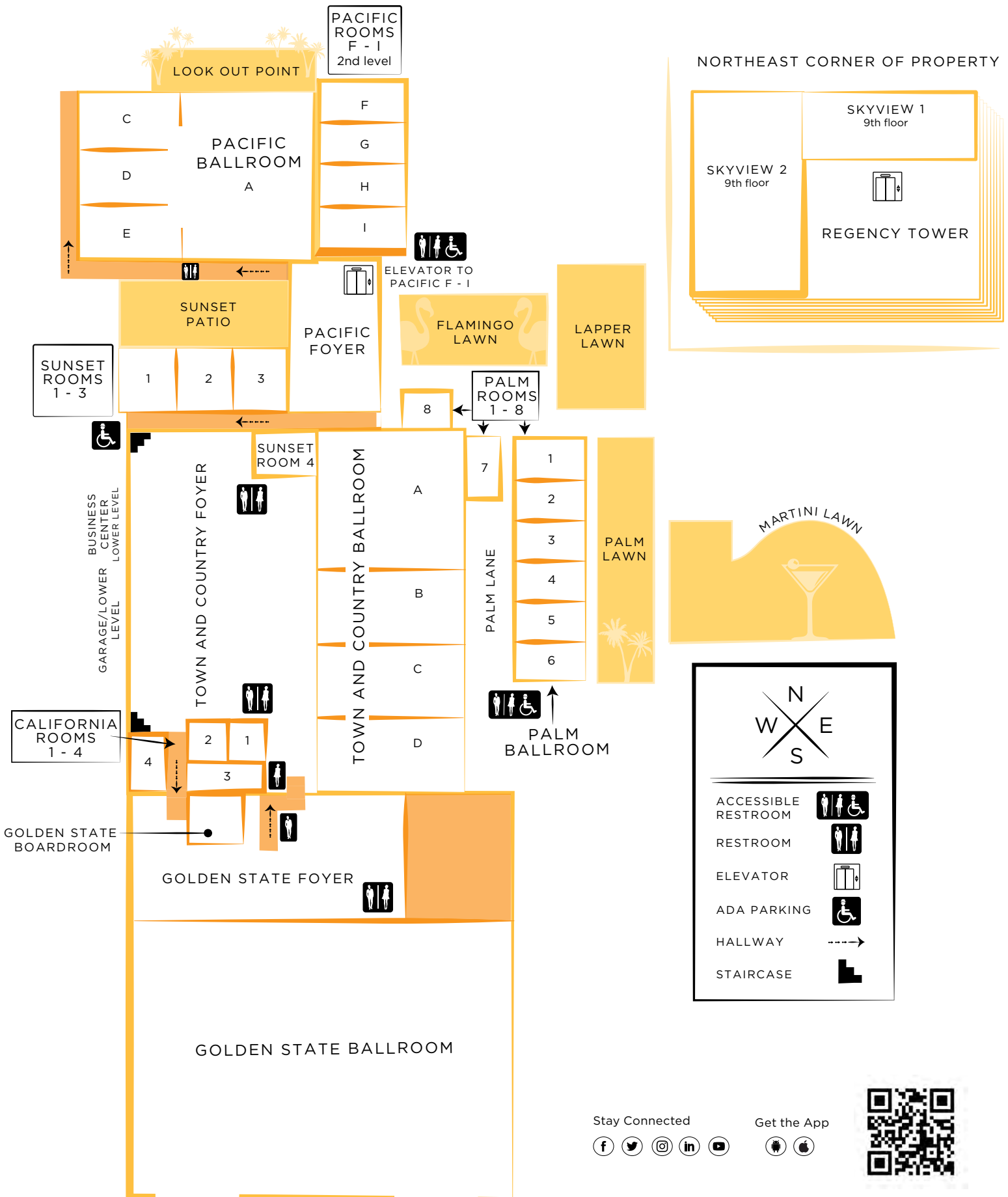
Event policies may change if local, state, or federal rules change prior to or during an event.

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TOWN AND COUNTRY RESORT & CONVENTION CENTER

LOOK OUT POINT

PACIFIC ROOMS F - I
2nd level

PACIFIC BALLROOM

C

D

E

A

F

G

H

I

NORTHEAST CORNER OF PROPERTY

SKYVIEW 1
9th floor

SKYVIEW 2
9th floor

REGENCY TOWER

ELEVATOR TO
PACIFIC F - I

SUNSET PATIO

PACIFIC FOYER

FLAMINGO LAWN

LAPPER LAWN

SUNSET ROOMS 1 - 3

1

2

3

PALM ROOMS 1 - 8

8

7

1

2

3

4

5

6

PALM LANE

PALM LAWN

MARTINI LAWN

SUNSET ROOM 4

A

B

C

D

TOWN AND COUNTRY FOYER

TOWN AND COUNTRY BALLROOM

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GARAGE/LOWER LEVEL

CALIFORNIA ROOMS 1 - 4

2

1

4

3

PALM BALLROOM

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W E
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SUNDAY 19 FEBRUARY

COURSES

8:30 AM–12:30 PM
SC471: Principles and Advancements in X-ray Computed Tomography
Instructor: **Jiang Hsieh**, Jiang & Jin, Inc (United States)

8:30 AM–12:30 PM
SC1239: Virtual Clinical Trials: An In-depth Tutorial
Instructors: **Ehsan Samei,** Carl E. Ravin Advanced Imaging Labs. (United States); **Ehsan Abadi,** Duke Univ. School of Medicine (United States); **Andrew D. A. Maidment,** Penn Medicine (United States)

8:30 AM–5:30 PM
SC086: Fundamentals of Medical Image Processing and Analysis
Instructor: **Thomas M. Deserno**, Peter L. Reichertz Institut für Medizinische Informatik (Germany)

8:30 AM–5:30 PM
SC1235: Introduction to Medical Image Analysis Using Convolutional Neural Networks
Instructors: **Markus T. Wenzel,** Fraunhofer-Institut für Digitale Medizin MEVIS (Germany); **Hans Meine,** Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

1:30 PM–5:30 PM
SC1129: Photon Counting CT
Instructors: **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden); **Mats U. Persson,** KTH Royal Institute of Technology (Sweden)

EVENING

5:30 PM–6:30 PM | Town & Country A
SPIE Medical Imaging Awards and Plenary
Symposium Chairs: **Robert M. Nishikawa,** Univ. of Pittsburgh (United States) and **Despina Kontos,** Univ. of Pennsylvania (United States)

Welcome and Introduction, Symposium Chair: **Robert M. Nishikawa,** University of Pittsburgh (United States)

Robert F. Wagner All-Conference Best Student Paper Award Announcement—*Award Sponsored by:* **MIPS and SPIE**

Acknowledgment of New SPIE Fellows

SPIE Harrison H. Barrett Award in Medical Imaging

Reliable deep learning in dynamic environments *(Keynote Presentation)*
Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

Thank you to the following cooperating organizations for their support

Conference 12468 **Biomedical** **Applications** **in Molecular,** **Structural, and** **Functional Imaging** Barjor S. Gimi; Andrzej Krol 19–22 February 2023 LOCATION: **Pacific E**	**Conference 12469** **Imaging** **Informatics for** **Healthcare,** **Research, and** **Applications** Brian J. Park; Hiroyuki Yoshida 19–21 February 2023 LOCATION: **Town & Country D**	**Conference 12470** **Ultrasonic Imaging** **and Tomography** Christian Boehm; Nick Bottenus 22–23 February 2023 LOCATION: **Town & Country D**	**Conference 12471** **Digital and** **Computational** **Pathology** John E. Tomaszewski; Aaron D. Ward 19–23 February 2023 LOCATION: **Palm 3/4**

SYMPOSIUM CHAIRS:

Robert M. Nishikawa
Univ. of Pittsburgh (United States)

Despina Kontos
Univ. of Pennsylvania, Department of Radiology (United States)

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Paid registration includes 50 content downloads from the SPIE Digital Library. SPIE will email details on using proceedings download tokens.

All-Symposium Welcome Reception
19 February 2023 • 6:30 PM–8:00 PM | Flamingo Lawn
Join your colleagues on the lawn for food and drinks as we welcome each other to SPIE Medical Imaging 2023.

See full details and updates at **spie.org/mi** or on the **SPIE App**

EVENT SCHEDULE

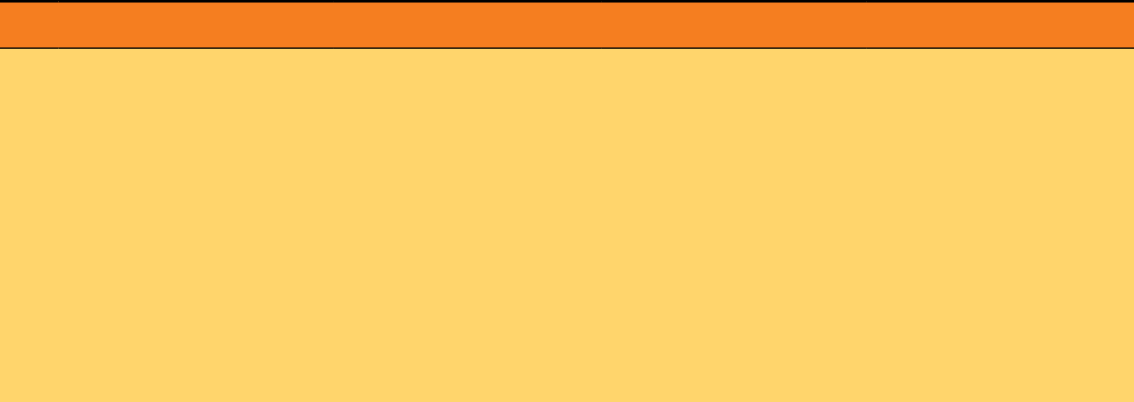| TIME	Conference 12463 **Physics of Medical Imaging** Lifeng Yu; Rebecca Fahrig; John M. Sabol 19–23 February 2023 LOCATION: **Town & Country A**	Conference 12464 **Image Processing** Olivier Colliot; Ivana Išgum 19–23 February 2023 LOCATION: **Town & Country B**	Conference 12465 **Computer-Aided Diagnosis** Khan M. Iftekharuddin; Weijie Chen 19–23 February 2023 LOCATION: **Town & Country C**	Conference 12466 **Image-Guided Procedures, Robotic Interventions, and Modeling** Cristian A. Linte; Jeffrey H. Siewerdsen 19–23 February 2023 LOCATION: **Pacific C**	Conference 12467 **Image Perception, Observer Performance, and Technology Assessment** Claudia R. Mello-Thoms; Yan Chen 21–23 February 2023 LOCATION: **Palm 5/6**
MORNING	**MONDAY 20 FEBRUARY**				
	8:30 AM–10:00 AM | Location: Town & Country A **Monday Morning Keynotes** Session Chairs: **Rebecca Fahrig,** Siemens Healthineers (Germany) and **Brian J. Park,** Oregon Health & Science Univ. (United States) **Welcome and Introduction** **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469** **Physics of Medical Imaging Best Paper Award Announcement—***Award Sponsored by:* **Konica Minolta** **State of the art in the task-based assessment of medical imaging systems** *(Keynote Presentation)* **Kyle J. Myers,** Puente Solutions, LLC (United States) **Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models** *(Keynote Presentation)* **Prashant Shah,** Intel Health and Life Sciences (United States)				
	10:30 AM Town & Country A **SESSION 1:** **Photon-Counting Computed Tomography (PCCT)**	10:30 AM Town & Country B **SESSION 1:** **Registration and Deformable Geometry**	10:30 AM Town & Country C **SESSION 1:** **Neurology**	10:30 AM Pacific C **SESSION 1:** **Video: Advances in Endoscopy**	
		12:00 PM–5:00 PM Pacific A **Monday Poster Viewing**	12:00 PM–5:00 PM Pacific A **Monday Poster Viewing**		
AFTERNOON	1:30 PM Town & Country A **SESSION 2:** **Tomosynthesis and Phase Contrast**	1:20 PM Town & Country B **SESSION 2:** **Classification and Segmentation**	1:20 PM Town & Country C **SESSION 2:** **Radiomics, Radiogenomics, and Multi-omics**	1:20 PM Pacific C **SESSION 2:** **Video: Robotic/ Laparoscopic Systems**	
	2:35 PM Town & Country A **SESSION 3:** **X-Ray Detectors**	3:30 PM Town & Country B **SESSION 3:** **Cardiovascular Applications**	3:30 PM Town & Country C **SESSION 3:** **COVID-19**	3:30 PM Pacific C **SESSION 3:** **Surgical Data Science/Analysis**	
EVENING		6:00 PM–8:00 PM Pacific A **Monday Poster Session**	6:00 PM–8:00 PM Pacific A **Monday Poster Session**		

COURSES

8:30 AM–5:30 PM
SC1295: From Analytic to Clinical Validation: Moving AI/ML into Practice
Instructors: **William Y. Hsu,** Univ. of California, Los Angeles (United States); **Matthew S. Brown,** UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States); **Robert M. Nishikawa,** Univ. of Pittsburgh (United States); **Elizabeth A. Krupinski,** Emory Univ. School of Medicine (United States)

1:30 PM–5:30 PM
SC1183: Modern Diagnostic X-ray Sources
Instructor: **Rolf K. Behling,** KTH Royal Institute of Technology (Germany)

Conference 12468 Biomedical Applications in Molecular, Structural, and Functional Imaging Barjor S. Gimi; Andrzej Krol 19–22 February 2023 LOCATION: **Pacific E**	Conference 12469 Imaging Informatics for Healthcare, Research, and Applications Brian J. Park; Hiroyuki Yoshida 19–21 February 2023 LOCATION: **Town & Country D**	Conference 12470 Ultrasonic Imaging and Tomography Christian Boehm; Nick Bottenus 22–23 February 2023 LOCATION: **Town & Country D**	Conference 12471 Digital and Computational Pathology John E. Tomaszewski; Aaron D. Ward 19–23 February 2023 LOCATION: **Palm 3/4**
10:30 AM Pacific E **SESSION 1: Machine Learning and Deep Learning**	10:30 AM Town & Country D **SESSION 1: AI Models and Platforms**		10:30 AM Palm 3/4 **SESSION 1: Automated Quantification of Tissue Biomarkers**
12:00 PM–5:00 PM Pacific A **Monday Poster Viewing**	12:00 PM–5:00 PM Pacific A **Monday Poster Viewing**		
1:15 PM Pacific E **SESSION 2: MRI, Optical Methods, and Applications**	1:30 PM Town & Country D **SESSION 2: AI Biases and Data Securities**		1:30 PM Palm 3/4 **SESSION 2: Multi-Stain, Multiplexed, and Multispectral Imaging and Analysis I**
3:45 PM Pacific E **SESSION 3: Novel Imaging Methods and Concepts I**	3:20 PM Town & Country D **SESSION 3: Multimedia Data and Hybrid Systems**		3:30 PM Palm 3/4 **SESSION 3: Multi-Stain, Multiplexed, and Multispectral Imaging and Analysis II**
6:00 PM–8:00 PM Pacific A **Monday Poster Session**	6:00 PM–8:00 PM Pacific A **Monday Poster Session**		

EXECUTIVE ORGANIZING COMMITTEE

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Univ. at Buffalo (United States)

Aaron Ward
The Univ. of Western Ontario (Canada)

Hiroyuki Yoshida
Massachusetts General Hospital (United States) and Harvard Medical School (United States)

Lifeng Yu
Mayo Clinic (United States)

EVENT SCHEDULE

TIME	Conference 12463 **Physics of Medical Imaging** Lifeng Yu; Rebecca Fahrig; John M. Sabol 19–23 February 2023 LOCATION: **Town & Country A**	Conference 12464 **Image Processing** Olivier Colliot; Ivana Išgum 19–23 February 2023 LOCATION: **Town & Country B**	Conference 12465 **Computer-Aided Diagnosis** Khan M. Iftekharuddin; Weijie Chen 19–23 February 2023 LOCATION: **Town & Country C**	Conference 12466 **Image-Guided Procedures, Robotic Interventions, and Modeling** Cristian A. Linte; Jeffrey H. Siewerdsen 19–23 February 2023 LOCATION: **Pacific C**	Conference 12467 **Image Perception, Observer Performance, and Technology Assessment** Claudia R. Mello-Thoms; Yan Chen 21–23 February 2023 LOCATION: **Palm 5/6**	
MORNING	**TUESDAY 21 FEBRUARY**					
	8:30 AM–10:00 AM | Location: Town & Country A **Tuesday Morning Keynotes** Session Chairs: **Olivier Colliot,** Ctr. National de la Recherche Scientifique (France) and **Claudia R. Mello-Thoms,** Univ. Iowa Carver College of Medicine (United States) **Welcome and Introduction + Monday Poster Session Award Announcements** **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467** **Image Processing Student Paper Award Announcement**—*Award Sponsored by:* **Philips** **ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries** *(Keynote Presentation)* **Paul M. Thompson,** University of Southern California (United States) **Human-AI collaboration** *(Keynote Presentation)* **Mark Steyvers,** Univ. of California, Irvine (United States)					
	10:30 AM Town & Country A **SESSION 4:** **Mammography**	10:40 AM Town & Country B **SESSION 4:** **Image Synthesis and Generative Models**	10:30 AM Town & Country C **SESSION 4:** **Breast**	10:30 AM Pacific C **SESSION 4:** **Cancer Intervention and Analysis**	10:30 AM Palm 5/6 **SESSION 1:** **Visual Search**	
AFTERNOON	1:10 PM Town & Country A **SESSION 5:** **Imaging for Therapy**	1:20 PM Town & Country B **Workshop on AI Using Large-Scale Data Warehouses**	1:20 PM Town & Country C **SESSION 5:** **Novel Applications**	1:20 PM Pacific C **SESSION 5:** **Image-Guided Liver Interventions**	1:20 PM Palm 5/6 **SESSION 2:** **Breast**	
	2:35 PM Town & Country A **SESSION 6:** **New Systems and Multi-Source Computed Tomography**	3:30 PM Town & Country B **SESSION 5:** **Brain Applications**	3:30 PM Town & Country C **SESSION 6:** **AI** *Joint Session with Conferences 12465 and 12467*	3:40 PM Pacific C **SESSION 6:** **Thoracic, Abdominal, and Cardiac Imaging**	3:30 PM Town & Country C **SESSION 3:** **AI** *Joint Session with Conferences 12465 and 12467*	
EVENING	6:00–8:00 PM • Town & Country A **Deep Learning in Medical Image Formation: Current Status and Future Directions Workshop** 6:00–8:00 PM • Pacific A **Live Demonstrations Workshop** 6:00–8:00 PM• Pacific A **Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC Workshop**					

COURSES

1:30 PM–5:30 PM
SC1324: Transformers: A Powerful Tool for Image Analysis and Generation
Instructors: **Markus T. Wenzel,** Fraunhofer-Institut für Digitale Medizin MEVIS (Germany);
Felix Thielke, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

| Conference 12468 Biomedical Applications in Molecular, Structural, and Functional Imaging	Conference 12469 Imaging Informatics for Healthcare, Research, and Applications	Conference 12470 Ultrasonic Imaging and Tomography	Conference 12471 Digital and Computational Pathology
Barjor S. Gimi; Andrzej Krol	Brian J. Park; Hiroyuki Yoshida	Christian Boehm; Nick Bottenus	John E. Tomaszewski; Aaron D. Ward
19–22 February 2023	19–21 February 2023	22–23 February 2023	19–23 February 2023
LOCATION: **Pacific E**	LOCATION: **Town & Country D**	LOCATION: **Town & Country D**	LOCATION: **Palm 3/4**
10:30 AM Pacific E **SESSION 4: Vascular Imaging**	10:30 AM Town & Country D **SESSION 4: Augmented Reality and the Digital Operating Room**		10:30 AM Palm 3/4 **SESSION 4: Grading and Classification of Pathology Images I**
1:15 PM Pacific E **SESSION 5: CT/XR Methods and Applications**	1:00 PM Town & Country D **SESSION 5: Radiomics**		1:30 PM Palm 3/4 **SESSION 5: Grading and Classification of Pathology Images II**
3:30 PM Pacific E **SESSION 6: Novel Imaging Methods and Concepts II**	2:00 PM Town & Country D **SESSION 6: Radiology Reporting**		3:30 PM Palm 3/4 **SESSION 6: Segmentation of Cellular and Tissue Structures**

Application tracks

Applications tracks list presentations on a specific topic together within the program so that participants can easily locate presentations in their area of interest. Learn about key technologies creating market opportunities and connect with people creating the future. Each track will highlight applicable papers.

See conference app or website for a full listing of presentations in each of these tracks: **spie.org/mi**
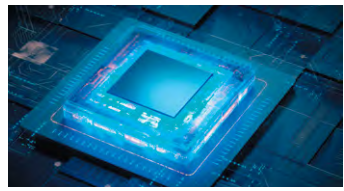
AI/ML

Papers that showcase the use of artificial intelligence, machine learning, and deep learning to create and implement intelligent systems across multiple sectors, technologies, and applications.

Net Zero

As international governments set aggressive targets for achieving net zero energy consumption, waste, and carbon emissions, optics and photonics will be key to the success of those goals.

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TIME	Conference 12463 Physics of Medical Imaging	Conference 12464 Image Processing	Conference 12465 Computer-Aided Diagnosis	Conference 12466 Image-Guided Procedures, Robotic Interventions, and Modeling	Conference 12467 Image Perception, Observer Performance, and Technology Assessment
	Lifeng Yu; Rebecca Fahrig; John M. Sabol	Olivier Colliot; Ivana Išgum	Khan M. Iftekharuddin; Weijie Chen	Cristian A. Linte; Jeffrey H. Siewerdsen	Claudia R. Mello-Thoms; Yan Chen
	19–23 February 2023	19–23 February 2023	19–23 February 2023	19–23 February 2023	21–23 February 2023
	LOCATION: **Town & Country A**	LOCATION: **Town & Country B**	LOCATION: **Town & Country C**	LOCATION: **Pacific C**	LOCATION: **Palm 5/6**

MORNING

WEDNESDAY 22 FEBRUARY

8:00 AM–10:10 AM | Town & Country A
Wednesday Morning Keynotes
Session Chairs: **Khan M. Iftekharuddin,** Old Dominion Univ. (United States) and
Aaron D. Ward, The Univ. of Western Ontario (Canada)

Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471
Computer-Aided Diagnosis Best Paper Award Announcement—*Award Sponsored by:* **Siemens Healthineers**

From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ., School of Medicine (United States)

Translating computational innovations into reality: focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

	Conference 12463	Conference 12464	Conference 12465	Conference 12466	Conference 12467
	10:30 AM Town & Country A **SESSION 7: Fluoroscopic and Radiographic Imaging**	10:30 AM Town & Country B **SESSION 6: Image Quality, Harmonization, and Quantitative Analysis**	10:30 AM Town & Country C **SESSION 7: Deep Learning II**	10:30 AM Pacific C **SESSION 7: Imaging/Analysis for Surgical Guidance**	10:30 AM Palm 5/6 **SESSION 4: Model Observers and Statistical Analyses**
	12:00 PM–5:00 PM Pacific A **Wednesday Poster Viewing**			12:00 PM–5:00 PM Pacific A **Wednesday Poster Viewing**	12:00 PM–5:00 PM Pacific A **Wednesday Poster Viewing**
AFTERNOON	1:10 PM Town & Country A **SESSION 8: Cone Beam Computed Tomography (CBCT)**	1:30 PM Town & Country B **SESSION 7: Deep-Dive Session**	1:20 PM Town & Country C **SESSION 8: Eye and Retina**	1:20 PM Pacific C **SESSION 8: Image-Guided Neurosurgery**	1:20 PM Palm 5/6 **SESSION 5: Artificial Intelligence I**
	3:40 PM Town & Country A **SESSION 9: Breast Tomography and Digital Trials**	3:30 PM Town & Country B **SESSION 8: Transformers**	3:30 PM Town & Country C **SESSION 9: Segmentation**	3:30 PM Town & Country D **SESSION 9: Ultrasound + Image-Guided Procedures** *Joint Session with Conferences 12466 and 12470*	3:30 PM Palm 5/6 **SESSION 6: Artificial Intelligence II**
EVENING	6:00 PM–8:00 PM Pacific A **Wednesday Poster Session**			6:00 PM–8:00 PM Pacific A **Wednesday Poster Session**	6:00 PM–8:00 PM Pacific A **Wednesday Poster Session**

Conference 12468 Biomedical Applications in Molecular, Structural, and Functional Imaging	Conference 12469 Imaging Informatics for Healthcare, Research, and Applications	Conference 12470 Ultrasonic Imaging and Tomography	Conference 12471 Digital and Computational Pathology
Barjor S. Gimi; Andrzej Krol	Brian J. Park; Hiroyuki Yoshida	Christian Boehm; Nick Bottenus	John E. Tomaszewski; Aaron D. Ward
19–22 February 2023	19–21 February 2023	22–23 February 2023	19–23 February 2023
LOCATION: **Pacific E**	LOCATION: **Town & Country D**	LOCATION: **Town & Country D**	LOCATION: **Palm 3/4**

10:30 AM Pacific E **SESSION 7: Neuroimaging**		10:30 AM Town & Country D **SESSION 1: Ultrasound Reconstruction**	10:30 AM Palm 3/4 **SESSION 7: Computer-Aided Diagnosis, Prognosis and Predictive Analysis I**
		12:00 PM–5:00 PM Pacific A **Wednesday Poster Viewing**	12:00 PM–5:00 PM Pacific A **Wednesday Poster Viewing**
		1:20 PM Town & Country D **SESSION 2: Ultrasound Beamforming and Signal Processing**	1:20 PM Palm 3/4 **SESSION 8: Computer-Aided Diagnosis, Prognosis and Predictive Analysis II**
		3:30 PM Town & Country D **SESSION 3: Ultrasound + Image-Guided Procedures** *Joint Session with Conferences 12466 and 12470*	3:30 PM Palm 3/4 **SESSION 9: Medical Applications**
		6:00 PM–8:00 PM Pacific A **Wednesday Poster Session**	6:00 PM–8:00 PM Pacific A **Wednesday Poster Session**

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EVENT SCHEDULE

TIME	Conference 12463 **Physics of Medical Imaging** Lifeng Yu; Rebecca Fahrig; John M. Sabol 19–23 February 2023 LOCATION: **Town & Country A**	Conference 12464 **Image Processing** Olivier Colliot; Ivana Išgum 19–23 February 2023 LOCATION: **Town & Country B**	Conference 12465 **Computer-Aided Diagnosis** Khan M. Iftekharuddin; Weijie Chen 19–23 February 2023 LOCATION: **Town & Country C**	Conference 12466 **Image-Guided Procedures, Robotic Interventions, and Modeling** Cristian A. Linte; Jeffrey H. Siewerdsen 19–23 February 2023 LOCATION: **Pacific C**	Conference 12467 **Image Perception, Observer Performance, and Technology Assessment** Claudia R. Mello-Thoms; Yan Chen 21–23 February 2023 LOCATION: **Palm 5/6**
MORNING	THURSDAY 23 FEBRUARY				

THURSDAY 23 FEBRUARY

8:30 AM–10:00 AM | Town & Country A
Thursday Morning Keynotes
Session Chairs: **Jeffrey H. Siewerdsen,** The Univ. of Texas MD Anderson Cancer Ctr. (United States) and **Christian Boehm,** ETH Zurich (Switzerland)

Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470
Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements—*Award Sponsored by:* **Intuitive Surgical** and **Siemens Healthineers**

Seeing and feeling in robot-assisted surgery *(Keynote Presentation)*
Allison Okamura, Stanford Univ. (United States)

Super-resolution ultrasound through localisation and tracking: technical developments and applications *(Keynote Presentation)*
Mengxing Tang, Imperial College London (United Kingdom)

	10:30 AM Town & Country A **SESSION 10: PET/SPECT Reconstruction**	10:30 AM Town & Country B **SESSION 9: Image Reconstruction, Correction, and Quality**	10:30 AM Town & Country C **SESSION 10: Head, Neck, and Musculoskeletal**	10:30 AM Pacific C **SESSION 10: Digital and Physical Models**	10:30 AM Palm 5/6 **SESSION 7: Technology Assessment**
AFTERNOON	1:10 PM Town & Country A **SESSION 11: CT Noise Reduction and Image Quality**	1:20 PM Town & Country B **SESSION 10: Segmentation**	1:20 PM Town & Country C **SESSION 11: Deep Learning II**	1:20 PM Pacific C **SESSION 11: Image-Guided and Robot-Assisted Surgery**	
	3:40 PM Town & Country A **SESSION 12: Computed Tomography Image Reconstruction**		3:30 PM Town & Country C **SESSION 12: Lung and Abdomen**	3:30 PM Pacific C **SESSION 12: Surgical Navigation**	

Thank you for participating at

Conference 12468 Biomedical Applications in Molecular, Structural, and Functional Imaging	Conference 12469 Imaging Informatics for Healthcare, Research, and Applications	Conference 12470 Ultrasonic Imaging and Tomography	Conference 12471 Digital and Computational Pathology
Barjor S. Gimi; Andrzej Krol	Brian J. Park; Hiroyuki Yoshida	Christian Boehm; Nick Bottenus	John E. Tomaszewski; Aaron D. Ward
19–22 February 2023	19–21 February 2023	22–23 February 2023	19–23 February 2023
LOCATION: **Pacific E**	LOCATION: **Town & Country D**	LOCATION: **Town & Country D**	LOCATION: **Palm 3/4**

			10:30 AM Town & Country D **SESSION 4:** **Ultrasound Image** **Quantification and** **Classification**	10:30 AM Palm 3/4 **SESSION 10:** **From Cell Detection** **to Whole-Slide** **Imagingtion**
			1:30 PM Town & Country D **SESSION 5:** **Ultrasound Waveform** **Tomography**	
			3:30 PM Town & Country D **SESSION 6:** **Applications of** **Machine Learning in** **Ultrasound**	

SPIE Medical Imaging 2023.

This program is current as of 28 January 2023—Find the latest on the SPIE Conference and Exhibition App.

13

COURSES

Courses for SPIE Medical Imaging

Advance your career by adding in-person training

Created and taught by experts, SPIE courses are designed to expand professional knowledge and skills.

Fundamentals of Medical Image Processing and Analysis

Course SC086 • Level: Intermediate
Sunday, 19 February 2023 • 8:30 AM–5:30 PM
Member: $735.00 / Non-member: $840.00
Student member: $411.00

INSTRUCTOR

Thomas M. Deserno - Peter L. Reichertz Institut für Medizinische Informatik (Germany)

Principles and Advancements in X-ray Computed Tomography

Course SC471 • Level: Introductory
Sunday, 19 February 2023 • 8:30 AM–12:30 PM
Member: $535.00 / Non-member: $600.00
Student member: $315.00

INSTRUCTOR

Jiang Hsieh - Jiang & Jin, Inc (United States)

Photon Counting CT

Course SC1129 • Level: Introductory
Sunday, 19 February 2023 • 1:30 PM–5:30 PM
Member: $450.00 / Non-member: $515.00
Student member: $281.00

INSTRUCTORS

Mats E. Danielsson - KTH Royal Institute of Technology (Sweden)
Mats U. Persson - KTH Royal Institute of Technology (Sweden)

Modern Diagnostic X-ray Sources

Course SC1183 • Level: Introductory
Monday, 20 February 2023 • 1:30 PM– 5:30 PM
Member: $450.00 / Non-member: $515.00
Student member: $281.00

INSTRUCTOR

Rolf K. Behling - KTH Royal Institute of Technology (Germany)

MONEY-BACK GUARANTEE

We are confident that once you experience an SPIE course for yourself you will look to us for your future education needs. However, if for any reason you are dissatisfied, we will gladly refund your money. We just ask that you tell us what you did not like; suggestions for improvement are always welcome.

Digital badges and certificates

SPIE awards digital badges and certificates to participants who attend courses and complete the evaluation and quiz. Digital credentials are always accessible, easily shareable, printable at any time, and verified. For more information visit spie.org/digital-badges

SPIE reserves the right to cancel a course due to insufficient advance registration.

Onsite courses

View course descriptions and register online.

SPIE Members and Student Members receive discounts on courses.

Introduction to Medical Image Analysis Using Convolutional Neural Networks

Sunday, 19 February 2023 • 8:30 AM–5:30 PM
Course SC1235 • Level: Introductory
Member: $780.00 / Non-member: $885.00
Student member: $429.00

INSTRUCTORS

Markus Thorsten Wenzel - Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

Hans Meine - Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

Virtual Clinical Trials: An In-depth Tutorial

Course SC1239 • Level: Intermediate
Sunday, 19 February 2023 • 8:30 AM–12:30 PM
Member: $495.00 / Non-member: $560.00
Student member: $299.00

INSTRUCTORS

Ehsan Samei - Carl E. Ravin Advanced Imaging Labs. (United States)

Ehsan Abadi - Duke Univ. School of Medicine (United States)

Andrew D. A. Maidment - Penn Medicine (United States)

From Analytic to Clinical Validation: Moving AI/ML into Practice

Course SC1295 • Level: Intermediate
Monday, 20 February 2023 • 8:30 AM–5:30 PM
Member: $735.00 / Non-member: $840.00
Student member: $411.00

INSTRUCTORS

William Y. Hsu - Univ. of California, Los Angeles (United States)

Matthew S. Brown - UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States)

Robert M. Nishikawa - Univ. of Pittsburgh (United States)

Elizabeth A. Krupinski - Emory Univ. School of Medicine (United States)

Transformers: A Powerful Tool for Image Analysis and Generation

Course SC1324 • Level: Intermediate
Tuesday, 21 February 2023 • 1:30 PM–5:30 PM
Member: $450.00 / Non-member: $520.00
Student member: $281.00

INSTRUCTORS

Markus Thorsten Wenzel - Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

Felix Thielke - Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

PLENARY AND KEYNOTE EVENTS

HEAR HIGHLIGHTS FROM LEADING RESEARCHERS

Medical Imaging plenary and keynote sessions feature presentations from a wide range of leaders in the field, with focus on developing research and visions of the future of imaging technologies.

SUNDAY
SPIE Medical Imaging Awards and Plenary

19 February 2023 • 5:30 PM–6:30 PM | Town & Country A

Attend announcements of the Robert F. Wagner Best Paper Awards and the SPIE Harrison H. Barrett Award in Medical Imaging, and hear from plenary speaker Zachary Chase Lipton.

5:30 PM:
Symposium Chair Welcome and Robert F. Wagner All-Conference Best Student Paper Award Announcement

Robert M. Nishikawa
University of Pittsburgh (United States), welcomes all SPIE Medical Imaging 2022 attendees and will announce the first-place winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award.

AWARD SPONSORED BY:

5:40 PM:
Acknowledgment of New SPIE Fellows
Recognition of members of the medical imaging community who have been selected this year as new SPIE Fellows.

5:45 PM:
SPIE Harrison H. Barrett Award in Medical Imaging
Presented in recognition of outstanding accomplishments in medical imaging.

5:50 PM:
Reliable deep learning in dynamic environments
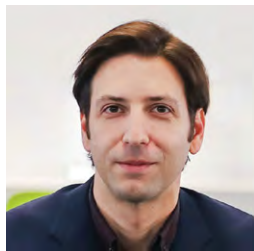
Zachary Chase Lipton
Carnegie Mellon Univ.
(United States)

Claims of deep learning's superhuman performance on medical tasks are typically predicated on evaluations in which the training data and test data sets are exchangeably (statistically identical), differentiated only by the random partitioning of a larger population from which both are sampled. However, this assumption is always violated in practice, sometimes with disastrous effects. Subtle differences in how images are captured or represented can bring an otherwise superhuman system down to unacceptably poor levels of accuracy. In this talk I will discuss the fundamental hardness of these problems—absent further assumptions on the nature of the shifts in distribution, no principled technique can exist for estimating the accuracy of models, let alone for adapting them to new environments. I will also discuss the vast landscape of (i) principled methods (and corresponding assumptions) for developing robust and adaptive predictive models and (ii) heuristic methods that have shown some promise on benchmarks but lack theory to guide their application.

Monday Morning Keynotes

20 February 2023 • 8:30 AM–10:00 AM | Town & Country A

Get a good start to your Monday with keynote talks from Kyle J. Myers and Prashant Shah explaining Medical image quality assessment and how the world's biggest federation is training state-of-the-art brain tumor segmentation models.

Session Chairs: **Rebecca Fahrig,** Siemens Healthineers (Germany) and **Brian J. Pa**rk, Oregon Health & Science Univ. (United States)

8:30 AM:
Welcome and Introduction

8:35 AM:
Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469

Physics of Medical Imaging Best Paper Award Announcement
AWARD SPONSORED BY:

KONICA MINOLTA

8:40 AM:
State of the art in the task-based assessment of medical imaging systems

Kyle J. Myers
Puente Solutions, LLC (United States)

This keynote is part of the Physics of Medical Imaging conference.

9:20 AM:
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models

Prashant Shah
Intel Health and Life Sciences (United States)

This keynote is part of the Imaging Informatics for Healthcare, Research, and Applications conference.

Tuesday Morning Keynotes

21 February 2023 • 8:30 AM–10:00 AM | Town & Country A

Wake up on Tuesday with keynote speakers Paul Thompson and Mark Steyvers covering topics on imaging and human-AI collaboration.

Session Chairs: **Olivier Colliot,** Ctr. National de la Recherche Scientifique (France) and **Claudia R. Mello-Thoms,** Univ. Iowa Carver College of Medicine (United States)

8:30 AM:
Welcome and Introduction

8:35 AM:
Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467

IMAGE PROCESSING STUDENT PAPER AWARD ANNOUNCEMENT AWARD SPONSORED BY:

8:40 AM:
ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries

Paul M. Thompson
University of Southern California (United States)

This keynote is part of the Image Processing conference.

9:20 AM:
Human-AI collaboration
Mark Steyvers
Univ. of California, Irvine (United States)

This keynote is part of the Image Perception, Observer Performance, and Technology Assessment conference.

Wednesday Morning Keynotes

22 February 2023 • 8:00 AM–10:10 AM | Town & Country A

Shake off your Wednesday morning with keynote speakers Dale Webster, Dan Ma, and Elizabeth Krupinski speaking on challenges in translating ML models into real-world products and computational innovations into reality.

Session Chairs: **Khan M. Iftekharuddin,** Old Dominion Univ. (United States) and **Aaron D. Ward**, The Univ. of Western Ontario (Canada)

8:00 AM:
Welcome and Introduction

8:05 AM:
Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement

AWARD SPONSORED BY:

8:10 AM:
From code to clinic: challenges in translating ML models into real-world products

Dale Webster
Google Health (United States)

This keynote is part of the Computer-Aided Diagnosis conference.

8:50 AM:
Clinical applications of fast and quantitative MR fingerprinting

Dan Ma
Case Western Reserve Univ.,
School of Medicine (United States)

This keynote is part of the Biomedical Applications in Molecular, Structural, and Functional Imaging conference.

9:30 AM:
Translating computational innovations into reality: focus on the users!

Elizabeth A. Krupinski
Emory Univ. School of Medicine (United States)

This keynote is part of the Digital and Computational Pathology conference.

Thursday Morning Keynotes
23 February 2023 • 8:30 AM–10:00 AM
Town & Country A

Thursday morning kicks off with speakers Allison Okamura on robot-assisted surgery and Mengxing Tang giving a talk on super-resolution ultrasound through localisation and tracking.

Session Chairs: **Jeffrey H. Siewerdsen,** The Univ. of Texas MD Anderson Cancer Ctr. (United States) and **Christian Boehm,** ETH Zurich (Switzerland)

8:30 AM:
Welcome and Introduction

8:35 AM:
Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470

Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements

AWARDS SPONSORED BY:

8:40 AM:
Seeing and feeling in robot-assisted surgery
Allison Okamura
Stanford Univ. (United States)

This keynote is part of the Image-Guided Procedures, Robotic Interventions, and Modeling conference.

9:20 AM:
Super-resolution ultrasound through localisation and tracking: technical developments and applications

Mengxing Tang
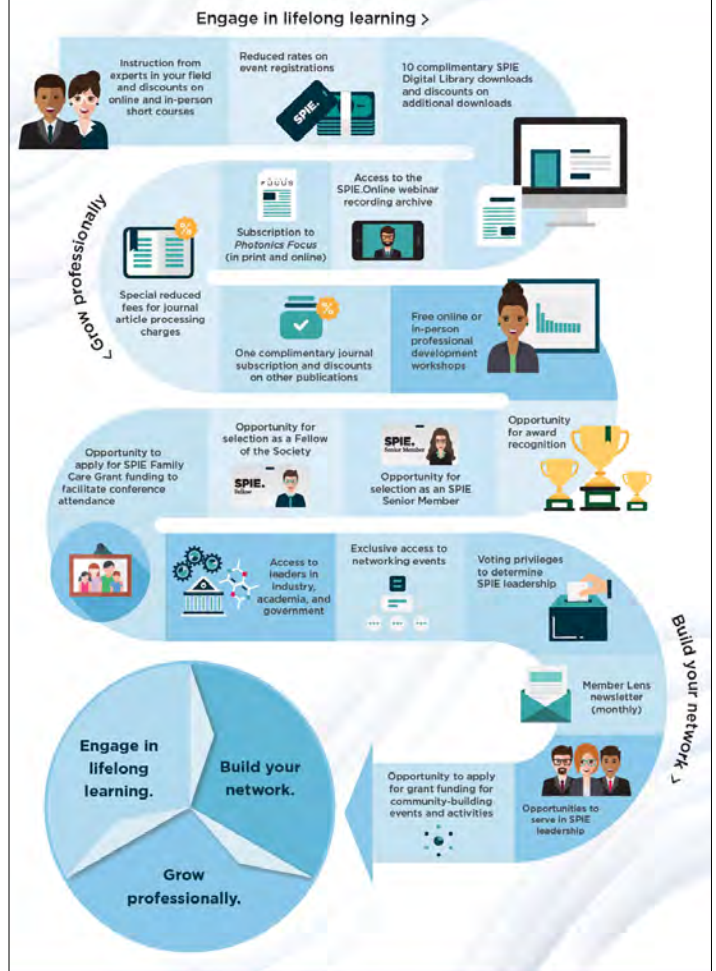Imperial College London (United Kingdom)

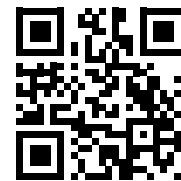This keynote is part of the Ultrasonic Imaging and Tomography conference.

TECHNICAL EVENTS

Connect with your colleagues and explore topics in depth. Events include daily technical networking sessions, and poster sessions.

Monday Poster Session

20 February 2023 • 6:00 PM–8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges.

Poster presentations from the following conferences will be included:

» Computer-Aided Diagnosis

» Image Processing

» Biomedical Applications in Molecular, Structural, and Functional Imaging

» Imaging Informatics for Healthcare, Research, and Applications

24-Hour Poster Setup Period:
5:00 PM Sunday–5:00 PM Monday*

In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Monday. Judging may begin after this time. Posters must remain on display until the end of the Monday evening poster session, but may be left hanging until 1:00 PM Tuesday.

12:00 PM to 5:00 PM:
Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Monday to browse the available posters before the evening session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Tuesday for extended viewing. All Posters must be removed by 1:00 PM on Tuesday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at:
https://spie.org/MI/Poster-Presentation- Guidelines

Workshop on AI Using Large-Scale Data Warehouses

21 February 2023 • 1:20 PM–3:10 PM | Town & Country B

This workshop will focus on AI and large-scale data warehouses in healthcare

Workshop Chair: **Olivier Colliot,** Ctr. National de la Recherche Scientifique (France); **Ivana Išgum,** Amsterdam UMC (Netherlands)

1:25 PM:
Radiology data warehouses: data preparation and dissemination

Ronald M. Summers
Senior Investigator
National Institute of Health (United States)

1:50 PM:
Design and implementation of a real-time research data warehouse: Lessons learned from Vanderbilt's ImageVU

Bennett A. Landman
Professor and Department Chair
Vanderbilt Univ. (United States)

2:15 PM:
Exploiting Hospital Data Warehouses: the Challenges of Image Quality and Heterogeneity
Ninon Burgos
Research Scientist
CNRS - Paris Brain Institute (France)

2:40 PM:
Panel Discussion

Live Demonstrations Workshop

21 February 2023 • 6:00 PM–8:00 PM | Pacific A

Workshop Chairs: **Karen Drukker,** The Univ. of Chicago Medicine (United States); **Lubomir M. Hadjiiski,** Michigan Medicine (United States); **Horst Karl Hahn,** Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging.

SPONSORED BY: **SIEMENS Healthineers**

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC

21 February 2023 • 6:00 PM– 8:00 PM | Pacific A

Attend this workshop to learn about the MIDRC and data collection/curation methods, accessing data and utilizing tools including evaluation metric selection, system evaluation approaches, and more.

Deep Learning in Medical Image Formation: Current Status and Future Directions

21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

This evening technical event is to update the SPIE Medical Imaging community on the latest development of deep-learning applications in medical imaging formation. Experts in the field will provide an overview of current status and future directions.

Welcome & Introduction
Lifeng Yu and **Rebecca Fahrig**
Conference Chairs, Physics of Medical Imaging

Part I: Academic and regulatory updates

Deep learning in CT reconstruction and artifact correction

Guang-Hong Chen
Univ. of Wisconsin at Madison (United States)

Deep learning reconstruction with known operators with applications in MRI, CT, and Hybrid Systems

Andreas Maier
Univ. of Erlangen-Nuremberg (Germany)

Uncertainties of deep learning in image noise reduction

Vegard Antun
Univ. of Oslo (Norway)

Generalizability performance of deep learning-based image reconstruction and denoising methods in CT

Rongping Zeng
FDA (United States)

Part II: Industry updates

Kirsten Boedeker, Canon Medical Systems (United States)
Brian Nett, GE Healthcare, (United States)
Michael Grass, Philips Healthcare (Germany)
Fei Han, Siemens Medical Solutions (United States)
Jonghyo Kim, Claripi and Seoul National University (Republic of Korea)

Wednesday Poster Session

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Authors of poster papers will be present to answer questions concerning their papers. Attendees are required to wear their conference registration badges.

Poster presentations from the following conferences will be included:

» Physics of Medical Imaging
» Image-Guided Procedures, Robotic Interventions, and Modeling
» Image Perception, Observer Performance, and Technology Assessment
» Ultrasonic Imaging and Tomography
» Digital and Computational Pathology

24-Hour Poster Setup Period:
5:00 PM Tuesday–5:00 PM Wednesday *
*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:
Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening session begins.
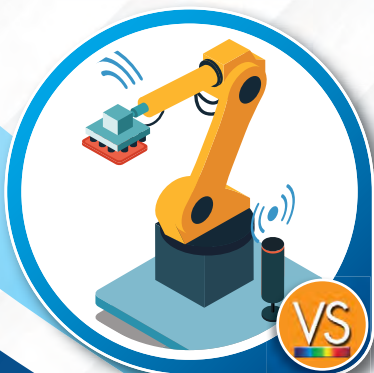
Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at:
https://spie.org/MI/Poster-Presentation-Guidelines

SOCIAL AND NETWORKING EVENTS

These sessions give you the opportunity to network, learn, and discuss with medical imaging professionals from around the world.

All-Symposium Welcome Reception

19 February 2023 • 6:30 PM–8:00 PM | Flamingo Lawn

Join your colleagues on the lawn for food and drinks as we welcome each other to SPIE Medical Imaging 2023. All registered conference attendees are invited to join your colleagues at the Welcome Reception. This informal networking event will be held on the Flamingo Lawn, located within the Town & Country grounds. Dress is casual.

SPIE Community Lounge

20 February 2023 • 8:00 AM–2:00 PM
SPIE Community Lounge (Palm 1)

Visit the SPIE Community Lounge to attend networking and professional development events or relax and recharge between sessions.

RELAX AND RECHARGE
Charge your devices, help yourself to refreshments, or simply decompress in the SPIE Community Lounge.

Women's Networking Lunch

20 February 2023 • 12:00 PM–1:30 PM
SPIE Community Lounge (Palm 1)

Join other women in the Medical Imaging field for informal discussions and networking during the scheduled lunch on Monday.

Monday Networking Lunch

20 February 2023 • 12:00 PM–1:30 PM | Flamingo Lawn

Join your colleagues for an informal networking lunch.

LGBTQ+ Meetup

20 February 2023 • 8:00 PM–9:00 PM
SPIE Community Lounge (Palm 1) | *Open to all attendees*

Come join us in the Community Lounge to socialize and network with other LGBTQ+ and allies in the medical imaging community.

Tuesday Networking Lunch

21 February 2023 • 12:00 PM–1:30 PM | Flamingo Lawn
Open to all attendees.

Join your colleagues for an informal networking lunch.

Student Travel Grant Winners Reception

21 February 2023 • 3:00 PM–4:00 PM
SPIE Community Lounge (Palm 1)

JMI Editor Reception

21 February 2023 • 7:30 PM–9:00 PM | *By Invitation Only*

The editorial volunteers for the *Journal of Medical Imaging* are invited to a private reception. Location information will be sent via invitation.

Wednesday Networking Lunch

22 February 2023 • 12:00 PM–1:30 PM | Flamingo Lawn
Open to all attendees.

Join your colleagues for an informal networking lunch. Open to all attendees.

Exploring Career Paths in Medical Imaging

22 February 2023 • 3:30 PM–4:30 PM
SPIE Community Lounge (Palm 1) | *Open to all attendees.*

Come hear expert panelists discuss their personal experiences navigating a wide array of career paths in medical imaging fields, so you can make informed decisions for your future.

Peer and Panelist Networking Social

22 February 2023 • 4:30 PM–5:30 PM
SPIE Community Lounge (Palm 1)

Join us for this networking social event following the career panel.

Student Member Meetup

22 February 2023 • 8:00 PM–9:00 PM
SPIE Community Lounge (Palm 1)

Student Members are invited to join this networking event for dessert and drinks, and a chance to meet up with students attending SPIE Medical Imaging.

GENERAL INFORMATION

Badge pick up and registration hours

Town and Country Resort & Convention Center -
Town and Country Foyer

Sunday 19 February	7:30 AM–6:00 PM
Monday 20 February	7:30 AM–4:00 PM
Tuesday 21 February	7:30 AM–4:00 PM
Wednesday 22 February	7:30 AM–4:00 PM
Thursday 23 February	7:30 AM–4:00 PM

SPIE Cashier

Town and Country Resort, Pacific Foyer
Open during registration hours.

Registration payments online only
If you are planning to register onsite, your credit card payment will be processed during registration. If you wish to pay with cash or check, register at the "Need to Register" stations; you will be directed to the Cashier once you have completed registration except for final payment.

If you have already registered and wish to add a course, workshop or special event, you may do this online by signing into your SPIE account.

Receipt and Certificate of Attendance
Preregistered attendees who need an SPIE-stamped receipt or attendees who need a Certificate of Attendance may obtain those at SPIE Cashier.

Badge Corrections
Badge corrections can be made at SPIE Cashier. Please have your badge removed from the badge holder and marked with your changes before approaching the counter.

Speaker check-in and preview station

Town and Country Resort, Sunset 1
Open during registration hours starting Sunday at 5:00 PM

All speakers must stop at Speaker Check-In to upload and preview their slide presentation files at least two hours before their scheduled session or the day before if you present in the first session. Speakers are not able to present using their own devices. All conference rooms are equipped with a laptop, projector, screen, lapel microphone, and laser pointer.

SPIE will record the audio plus screen content of all presentations; Recordings will be published on the SPIE Digital Library.

SPIE health and safety products

Location: Town and Country Resort, Pacific Foyer - Open during registration hours

Stop by SPIE Registration to pick up face masks, hand sanitizer, and other safety products all free from SPIE.

Internet access

Lobbies, Meeting Rooms, and Registration area

Complimentary wireless internet access provided in meeting rooms and lobbies on the conference room level and in the exhibition hall. Instructions will be posted onsite.

SPIE Conference and exhibition app

This useful tool allows you to search and browse the program, special events, participants, exhibitors, courses, and more. It is free and available for iPhone and Android phones.

If you don't already have it, Download the SPIE App.

SPIE Course materials

Location: Town and Country Resort, Pacific Foyer - Open during registration hours

Browse course offerings or learn more about SPIE courses available in portable formats such as online and customizable, in-company courses.

SPIE Bookstore

Location: Town and Country Foyer

Monday–Thursday . . . . .9:00 AM–5:00 PM

Stop by the SPIE Bookstore to browse the latest SPIE Press Books. While there, get a t-shirt or educational toy to bring home to the family.

Credit and debit cards only will be accepted; no cash.

SPIE luggage & coat check

Complimentary luggage, package, and coat storage are available in the hotel lobby for guests staying at the Town and Country Resort.

Business Center

Location: Town and Country Foyer, Lower Level (North)

Child care services

Sitterwise
Email: sarah@sitterwise.com
Office: 619.303.4379 or text 619.663.4379
Make a reservation online. Sitterwise.com

Note: SPIE does not imply an endorsement nor recommendation of these services. They are provided on an "information only" basis for your further analysis and decision. Other services may be available.

Did you know SPIE offers Family Care Grants to SPIE member? For more information on deadlines and how to apply check the details here.

Gender inclusive restrooms

Single occupancy all-gender restrooms available outside Pacific F-I (Level 2)

Quiet Room

Location: Town and Country Resort, California 3
|Open during registration hours

The Quiet Room is intended for silent meditation, reflection, and prayer. No mobile devices or computer use is allowed, and no food nor beverages are allowed.

Mothers' Lounge

Location: Town and Country Resort, California 4
Open during registration hours.

The Mothers' Lounge is a lockable room intended for nursing mothers. There is no storage, running water, or refrigeration available in this space.

GENERAL INFORMATION

Lost and found

Location: Town and Country Resort, Pacific Foyer - Open during registration hours

Found items will be kept at SPIE Cashier in the Registration area during the meeting and available only during registration hours. At the end of the meeting, all found items will be turned over to the Town and Country Resort & Convention Center Security. Food and beverage services

Coffee Breaks - complimentary coffee

Pacific and Town and Country Foyers

Sunday . . . . 7:30 AM–6:30 PM

Monday–Thursday . . . . 7:30 AM–4:00 PM

SPIE hosted lunches

Location: Town and Country Resort, Flamingo Lawn

Monday–Wednesday . . . . 12:00 PM–1:30 PM

Check individual conference listings for exact times. Lunches are included with full conference registrations.

HARASSMENT

consists of unwanted, unwelcomed, and uninvited behavior that demeans, threatens, or offends another.

To report harassment you have witnessed or experienced at this meeting, contact any SPIE staff member or use the SPIE reporting hotline at 1-888-818-6898 or spie.ethicspoint.com.

More information:

spie.org/conduct

Supported by

APS physics   IEEE ComSoc   IEEE Photonics Society   OPTICA   SPIE.

PLAN TO ATTEND

SPIE. MEDICAL IMAGING

18–22 February 2024
Town and Country Resort & Convention Center
San Diego, California, USA

LEADING RESEARCHERS CONTRIBUTING TO THE ADVANCEMENT OF MEDICAL IMAGING TECHNOLOGIES.

MARK YOUR CALENDAR

spie.org/mi
#SPIEMedicalImaging

CONFERENCE 12463

Physics of Medical Imaging

19–23 February 2023 | Town & Country A

Conference Chairs: **Lifeng Yu,** Mayo Clinic (United States);
Rebecca Fahrig, Siemens Healthineers (Germany)

Conference Co-Chair: **John M. Sabol,** Konica Minolta Healthcare Americas, Inc. (United States)

Program Committee: **Shiva Abbaszadeh**, Univ. of California, Santa Cruz (United States); **Adam M. Alessio,** Michigan State Univ. (United States); **Hilde Bosmans,** Univ. Ziekenhuis Leuven (Belgium); **Seungryong Cho,** KAIST (Republic of Korea); **Mini Das,** Univ. of Houston (United States); **Mats E. Danielsson,** KTH Royal Institute of Technology (Sweden); **Maria Drangova,** Robarts Research Institute (Canada); **Thomas G. Flohr,** Siemens Healthineers (Germany); **Arundhuti Ganguly,** TibaRay (United States); **Yongshuai Ge,** Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences (China); **Stephen J. Glick,** U.S. Food and Drug Administration (United States); **Taly Gilat Schmidt,** Marquette Univ. (United States); **Marc Kachelriess,** Deutsches Krebsforschungszentrum (Germany); **Karim S. Karim,** Univ. of Waterloo (Canada); **Patrick J. La Riviere,** The Univ. of Chicago (United States); **Ke Li,** Univ. of Wisconsin School of Medicine and Public Health (United States); **Quanzheng Li,** Massachusetts General Hospital (United States); **Joseph Y. Lo,** Carl E. Ravin Advanced Imaging Labs. (United States); **Peter B. Noël,** Univ. of Pennsylvania (United States); **Frédéric Noo,** The Univ. of Utah (United States); **Jinyi Qi,** Univ. of California, Davis (United States); **Ioannis Sechopoulos,** Radboud Univ. Medical Ctr. (Netherlands); **Behrouz Shabestari,** National Institute of Biomedical Imaging and Bioengineering (United States); **Joseph W. Stayman,** Johns Hopkins Univ. (United States); **Anders Tingberg,** Skåne Univ. Hospital (Sweden); **Adam S. Wang,** Stanford Univ. School of Medicine (United States); **Yuxiang Xing,** Tsinghua Univ. (China); **Wei Zhao,** Stony Brook Univ. (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: **Symposium Chair Welcome and Best Student Paper Award Announcement**

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

SPIE.

5:40 pm: **New SPIE Fellows Acknowledgments**

5:45 pm: **SPIE Harrison H. Barrett Award in Medical Imaging**
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments *(Plenary Presentation)*
Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement**

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

CONFERENCE 12463

SESSION 1: PHOTON-COUNTING COMPUTED TOMOGRAPHY (PCCT)

20 February 2023 • 10:30 AM - 12:10 PM | Town & Country A
 Session Chairs: Taly Gilat Schmidt, Marquette Univ. (United States), Peter B. Noël, Univ. of Pennsylvania (United States)

12463-1 • 10:30 AM - 10:50 AM | Town & Country A
A systematic assessment of photon-counting CT for bone mineral density and microarchitecture quantifications
Author(s): Cindy McCabe, Thomas J. Sauer, Mojtaba Zarei, William P. Segars, Ehsan Samei, Ehsan Abadi, Carl E. Ravin Advanced Imaging Labs. (United States)

12463-2 • 10:50 AM - 11:10 AM | Town & Country A
Noise2Noise for denoising photon counting CT images: generating training data from existing scans
Author(s): Sen Wang, Yirong Yang, Stanford Univ. (United States); Zhye Yin, GE Healthcare (United States); Adam Wang, Stanford Univ. (United States)

12463-3 • 11:10 AM - 11:30 AM | Town & Country A
Photon counting spectral computed tomography in diagnosis of joint conditions using novel bismuth contrast agent
Author(s): Abhisek Bhattarai, Jamie Lok Guan-Tai, Hongzhe Sun, Varut Vardhanabhuti, The Univ. of Hong Kong (Hong Kong, China)

12463-4 • 11:30 AM - 11:50 AM | Town & Country A
Scatter-to-primary ratio in photon counting CT
Author(s): Ran Zhang, Ke Li, Guang-Hong Chen, Univ. of Wisconsin School of Medicine and Public Health (United States)

12463-5 • 11:50 AM - 12:10 PM | Town & Country A
Effects of bowtie scatter on material decomposition in photon-counting CT
Author(s): Yang Tai, Donghyeon Lee, Johns Hopkins Univ. (United States); Xiaohui Zhan, Canon Medical Systems USA, Inc. (United States); Katsuyuki Taguchi, Wojciech Zbijewski, Johns Hopkins Univ. (United States)

Lunch Break 12:10 PM - 1:10 PM

SESSION 2: TOMOSYNTHESIS AND PHASE CONTRAST

20 February 2023 • 1:30 PM - 2:30 PM | Town & Country A
Session Chairs: John M. Sabol, Konica Minolta Healthcare Americas, Inc. (United States), Mini Das, Univ. of Houston (United States)

12463-6 • 1:30 PM - 1:50 PM | Town & Country A
Feasibility study of dynamic lung tomosynthesis using stationary x-ray source arrays
Author(s): Alejandro Lopez Montes, Johns Hopkins Univ. (United States); Levon O. Vogelsang, Xiaohui Wang, Jim Sehnert, Carestream Health, Inc. (United States); Alejandro Sisniega, Wojciech Zbijewski, Johns Hopkins Univ. (United States)

12463-8 • 1:50 PM - 2:10 PM | Town & Country A**Multimodal single-shot x-ray phase-contrast imaging using a high-resolution micropillar-based grating**
Author(s): Abdollah Pil-Ali, Univ. of Waterloo (Canada); Serena Qinyun Z. Shi, Univ. of Pennsylvania (United States); Sahar Adnani, Univ. of Waterloo (Canada); Peter B. Noël, Univ. of Pennsylvania (United States); Karim S. Karim, Univ. of Waterloo (Canada)

12463-9 • 2:10 PM - 2:30 PM | Town & Country A
Simulation study of a novel ZnO nanowire cold cathode flat-panel x-ray source using EGSnrc for Talbot-Lau type grating interferometry
Author(s): Wangjiang Wu, Jiancong Dai, Mengke Qi, Southern Medical Univ. (China); Song Kang, Sun Yat-Sen Univ. (China); Zengxiang Pan, Xiaoying Zhang, Southern Medical Univ. (China); Shaojie Chang, Mayo Clinic (United States); Linghong Zhou, Southern Medical Univ. (China); Jun Chen, Sun Yat-Sen Univ. (China); Yuan Xu, Southern Medical Univ. (China)

SESSION TRANSITION 2:30 PM - 2:35 PM

SESSION 3: X-RAY DETECTORS

20 February 2023 • 2:35 PM - 5:20 PM | Town & Country A
 Session Chairs: Karim Salaudin Karim, Univ. of Waterloo (Canada), Ke Li, Univ. of Wisconsin School of Medicine and Public Health (United States)

12463-10 • 2:35 PM - 2:55 PM | Town & Country A
Impact of pulse pileup on single- and multi-energy images from a clinical photon counting detector CT
Author(s): Joshua R. Chen, Timothy Winfree, Michael Bruesewitz, Joseph Swicklik, Jamison Thorne, Shuai Leng, Cynthia McCollough, Mayo Clinic (United States)

12463-11 • 2:55 PM - 3:15 PM | Town & Country A
A study of crosstalk effect in pixelated photon counting detectors and impact to system imaging performance
Author(s): Xiaohui Zhan, Shuoxing Wu, Ilmar Hein, Ruoqiao Zhang, Brent Budden, Cameron Clarke, Nicolay Markov, Yi Qiang, Yu Zhou, Richard Thompson, Canon Medical Research USA, Inc. (United States); Hiroaki Nakai, Hiroaki Miyazaki, Canon Medical Systems Corp. (Japan)

Coffee Break 3:15 PM - 3:40 PM

12463-12 • 3:40 PM - 4:00 PM | Town & Country A
Intra-detector x-ray scatterings in edge-on irradiated silicon photon counting CT: How to harvest information from scattered photons?
Author(s): Ke Li, Christian De Caro, Ran Zhang, Guang-Hong Chen, Univ. of Wisconsin-Madison (United States)

12463-13 • 4:00 PM - 4:20 PM | Town & Country A
Comparison of energy bin compression strategies using a prototype silicon photon counting CT detector
Author(s): Yirong Yang, Adam S. Wang, Sen Wang, Stanford Univ. (United States); Zhye Yin, Jiahua Fan, Jonathan Maltz, Debashish Pal, GE Healthcare (United States)

12463-14 • 4:20 PM - 4:40 PM | Town & Country A
Charge sharing correction for photon counting detectors with coincidence counters
Author(s): Katsuyuki Taguchi, Johns Hopkins Medicine (United States); Scott S. Hsieh, Mayo Clinic (United States)

12463-15 • 4:40 PM - 5:00 PM | Town & Country A
Photon-count detector model using local parameters for pixel-to-pixel deviations
Author(s): Donghyeon Lee, Johns Hopkins Univ. School of Medicine (United States); Xiaohui Zhan, Canon Medical Research USA, Inc. (United States); Yang Tai, Wojciech Zbijewski, Johns Hopkins Univ. (United States); Katsuyuki Taguchi, Johns Hopkins Univ. School of Medicine (United States)

12463-17 • 5:00 PM - 5:20 PM | Town & Country A

Charge collection efficiency of CdTe detectors: impact of charge collection time and polarisation

Author(s): Maxime Daniel, Mats Danielsson, KTH Royal Institute of Technology (Sweden); Brian D. Yanoff, GE Research (United States); Mats U. Persson, KTH Royal Institute of Technology (Sweden)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A

ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)

Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A

Human-AI collaboration *(Keynote Presentation)*

Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: MAMMOGRAPHY

21 February 2023 • 10:30 AM - 11:50 AM | Town & Country A
Session Chairs: Stephen J. Glick, U.S. Food and Drug Administration (United States), Hilde Bosmans, Univ. Ziekenhuis Leuven (Belgium)

12463-18 • 10:30 AM - 10:50 AM | Town & Country A

4D digital breast phantom for contrast-enhanced imaging

Author(s): Dan Li, Andrey V. Makeev, Stephen J. Glick, U.S. Food and Drug Administration (United States)

12463-20 • 10:50 AM - 11:10 AM | Town & Country A

Theoretical basis and experimental validation of harmonic coherence-based ultrasound imaging for breast mass diagnosis

Author(s): Khadijat Kokumo, Northwestern Univ. (United States); Arunima Sharma, Johns Hopkins Univ. (United States); Kelly Myers, Emily Ambinder, Eniola Oluyemi, The Johns Hopkins Univ. School of Medicine (United States); Muyinatu A. Lediju Bell, Johns Hopkins Univ. (United States)

12463-21 • 11:10 AM - 11:30 AM | Town & Country A

A new approach for the objective assessment of breast imaging technologies: mass classification tasks

Author(s): Dan Li, Stephen J. Glick, U.S. Food and Drug Administration (United States)

12463-22 • 11:30 AM - 11:50 AM | Town & Country A

Impact of cone-beam CT noise correlation on self-supervised denoising strategies for low dose breast CT imaging

Author(s): Alejandro Sisniega, Johns Hopkins Univ. (United States); Andrew M. Hernandez, Univ. of California, Davis (United States); John McGraw, Younes Achkire, Izotropic Corp. (Canada); Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); John M. Boone, Univ. of California, Davis (United States)

Lunch Break 11:50 AM - 1:10 PM

SESSION 5: IMAGING FOR THERAPY

21 February 2023 • 1:10 PM - 2:30 PM | Town & Country A
Session Chairs: Arundhuti Ganguly, TibaRay (United States), Joseph Y. Lo, Carl E. Ravin Advanced Imaging Labs. (United States)

12463-23 • 1:10 PM - 1:30 PM | Town & Country A

Real-time single frame tomosynthesis: prototype and radiotherapy applications

Author(s): Scott S. Hsieh, Lydia W. Ng, Mayo Clinic (United States); Minsong Cao, Univ. of California, Los Angeles (United States); Percy P. Lee, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12463-24 • 1:30 PM - 1:50 PM | Town & Country A

Predicting the dose distribution of multi-lesion lung stereotactic ablative radiotherapy plans using generative adversarial networks

Author(s): Edward Wang, Western Univ. (Canada); Jonatan Snir, Jaron Chong, London Health Sciences Ctr. (Canada); Sarah Mattonen, Western Univ. (Canada); Pencilla Lang, London Health Sciences Ctr. (Canada)

12463-25 • 1:50 PM - 2:10 PM | Town & Country A

A histotripsy targeting approach using a mobile C-arm

Author(s): Martin G. Wagner, Paul F. Laeseke, Ayca Kutlu, Grace M. Minesinger, Sarvesh Periyasamy, Michael A. Speidel, Univ. of Wisconsin-Madison (United States)

12463-26 • 2:10 PM - 2:30 PM | Town & Country A

Spectral CT thermometry with improved temperature sensitivity for image-guided thermal ablation

Author(s): Leening P. Liu, Rizza Pua, Derick N. Rosario-Berrios, Olivia F. Sandvold, Univ. of Pennsylvania (United States); Kevin M. Brown, Philips Healthcare (United States); Grace J. Gang, Michael C. Soulen, Nadav Shapira, Peter B. Noël, Univ. of Pennsylvania (United States)

SESSION TRANSITION 2:30 PM - 2:35 PM

SESSION 6: NEW SYSTEMS AND MULTI-SOURCE COMPUTED TOMOGRAPHY

21 February 2023 • 2:35 PM - 5:40 PM | Town & Country A
Session Chairs: Seungryong Cho, KAIST (Republic of Korea), Rebecca Fahrig, Siemens Healthineers (Germany)

12463-27 • 2:35 PM - 2:55 PM | Town & Country A

Data driven methods for ultrasound computed tomography

Author(s): Luke Lozenski, Washington Univ. in St. Louis (United States); Hanchen Wang, Brendt Wohlberg, Los Alamos National Lab. (United States); Umberto Villa, Oden Institute, The Univ. of Texas at Austin (United States); Youzuo Lin, Los Alamos National Lab. (United States)

CONFERENCE 12463

12463-28 • 2:55 PM - 3:15 PM | Town & Country A

Low-rank matrix estimation-based spatiotemporal image reconstruction from few tomographic measurements per frame for dynamic photoacoustic computed tomography

Author(s): Refik Mert Cam, Univ. of Illinois (United States); Chao Wang, National Univ. of Singapore (Singapore); Weylan Thompson, Sergey A. Ermilov, PhotoSound Technologies, Inc. (United States); Mark A. Anastasio, Univ. of Illinois (United States); Umberto Villa, Oden Institute, The Univ. of Texas at Austin (United States)

Coffee Break 3:15 PM - 3:40 PM

12463-29 • 3:40 PM - 4:00 PM | Town & Country A

Preliminary investigation of image reconstruction from data over reduced angular range in spectral-spatial electron paramagnetic resonance imaging

Author(s): Zheng Zhang, Buxin Chen, Dan Xia, Emil Sidky, Boris Epel, The Univ. of Chicago Medicine (United States); Zhiwei Qiao, Shanxi Univ. (China); Xiaochuan Pan, The Univ. of Chicago Medicine (United States)

12463-31 • 4:00 PM - 4:20 PM | Town & Country A

Spectral micro-CT imaging of multiple K-edge elements using GaAs and CdTe photon counting detectors

Author(s): Alex J. Allphin, Duke Univ. School of Medicine (United States); Darin P. Clark, Duke Univ. Medical Ctr. (United States); Thomas Thuering, DECTRIS Ltd. (Switzerland); Prajwal Bhandari, Ketan B. Ghaghada, Baylor College of Medicine (United States); Cristian T. Badea, Duke Univ. School of Medicine (United States)

12463-32 • 4:20 PM - 4:40 PM | Town & Country A

Multiple focal spots for high resolution CT

Author(s): Joseph W. Stayman, Johns Hopkins Univ. (United States); Peter B. Noel, Univ. of Pennsylvania (United States); Grace J. Gang, Johns Hopkins Univ. (United States)

12463-33 • 4:40 PM - 5:00 PM | Town & Country A

Adaptive kernel-based scatter correction for multi-source stationary CT with non-circular geometry

Author(s): Thomas McSkimming, Alejandro Lopez-Montez, Johns Hopkins Univ. (United States); Anthony Skeats, Chris Delnooz, Micro-X Ltd. (Australia); Brian Gonzales, Micro-X Inc. (United States); Egon Perilli, Karen Reynolds, Flinders Univ. (Australia); Wojciech Zbijewski, Alejandro Sisniega, Johns Hopkins Univ. (United States)

12463-34 • 5:00 PM - 5:20 PM | Town & Country A

Preliminary evaluation of a multi-source CBCT design

Author(s): Shuang Xu, Boyuan Li, Christina R. Inscoe, Daniel Bastawros, Donald A. Tyndall, Yueh Z. Lee, Jianping Lu, Otto Z. Zhou, The Univ. of North Carolina at Chapel Hill (United States)

Deep Learning in Medical Image Formation: Current Status and Future Directions
21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: FLUOROSCOPIC AND RADIOGRAPHIC IMAGING

22 February 2023 • 10:30 AM - 12:10 PM | Town & Country A
Session Chairs: Joseph Y. Lo, Carl E. Ravin Advanced Imaging Labs. (United States), Wei Zhao, Stony Brook Univ. (United States)

12463-35 • 10:30 AM - 10:50 AM | Town & Country A
Approaches for three material decomposition using a triple-layer flat-panel detector
Author(s): Xiao Jiang, Joseph W. Stayman, Grace J. Gang, Johns Hopkins Univ. (United States)

12463-36 • 10:50 AM - 11:10 AM | Town & Country A
Three-material decomposition using a dual layer flat panel detector in the presence of soft tissue motion
Author(s): Grace J. Gang, Univ. of Pennsylvania (United States); Joseph W. Stayman, Johns Hopkins Univ. (United States)

12463-37 • 11:10 AM - 11:30 AM | Town & Country A
Use of high-speed angiography (HSA)-derived boundary conditions and physics informed neural networks (PINNs) for comprehensive estimation of neurovascular hemodynamics
Author(s): Kyle A. Williams, Univ. at Buffalo (United States); Allison Shields, Mohammad Mahdi Shiraz Bhurwani, S.V. Setlur Nagesh, Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Canon Stroke and Vascular Research Ctr. (United States)

12463-38 • 11:30 AM - 11:50 AM | Town & Country A
Integration of single-shot quantitative x-ray imaging on a C-arm system for static and dynamic phantom studies
Author(s): Linxi Shi, Robert Bennett, Nishita Kothary, Alexander Vezeridis, Stanford Univ. School of Medicine (United States); Adam Wang, Stanford Univ. (United States)

12463-39 • 11:50 AM - 12:10 PM | Town & Country A
Flat panel detector with a drainable liquid spectral separator for dual-energy x-ray and cone-beam CT imaging
Author(s): Emily Cai, Kevin Treb, Christian De Caro, Ke Li, Univ. of Wisconsin-Madison (United States)

Lunch Break 12:10 PM - 1:10 PM

SESSION 8: CONE BEAM COMPUTED TOMOGRAPHY (CBCT)

22 February 2023 • 1:10 PM - 3:10 PM | Town & Country A
Session Chairs: Joseph Webster Stayman, Johns Hopkins Univ. (United States), Adam S. Wang, Stanford Univ. School of Medicine (United States)

12463-40 • 1:10 PM - 1:30 PM | Town & Country A
Cone-Beam CT Trajectory Optimization for Metal Artifact Avoidance Using Ellipsoidal Object Parameterizations
Author(s): Maximilian Rohleder, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany), Siemens Healthineers (Germany), Johns Hopkins Univ. (United States); Lina Mekki, Ali Uneri, Alex Sisniega, Johns Hopkins Univ. (United States); Gerhard Kleinszig, Holger Kunze, Siemens Healthineers (Germany); Andreas Maier, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Bjoern W. Kreher, Siemens Healthineers (Germany); Jeffrey H. Siewerdsen, Johns Hopkins Univ. (United States)

12463-41 • 1:30 PM - 1:50 PM | Town & Country A
Cone-beam CT with a noncircular (sine-on-sphere) orbit: imaging performance of a clinical system for image-guided interventions
Author(s): Aaron K. Jones, Moiz U. Ahmad, Shaan Raza, Stephen R. Chen, Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12463-42 • 1:50 PM - 2:10 PM | Town & Country A
Progressive adaptive sampling autofocus with learning-based metric for deformable motion compensation in interventional cone-beam CT
Author(s): Heyuan Huang, Johns Hopkins Univ. (United States); Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Alex Lu, Yicheng Hu, Wojciech Zbijewski, Mathias Unberath, Clifford R. Weiss, Alejandro Sisniega, Johns Hopkins Univ. (United States)

12463-43 • 2:10 PM - 2:30 PM | Town & Country A
Quantitative dual-energy imaging of bone marrow edema using multi-source cone-beam CT with model-based decomposition
Author(s): Stephen Z. Liu, The Johns Hopkins Univ. School of Medicine (United States); Greg M. Osgood, Shadpour Demehri, The Johns Hopkins Hospital (United States); Joseph W. Stayman, Wojciech Zbijewski, The Johns Hopkins Univ. School of Medicine (United States)

12463-44 • 2:30 PM - 2:50 PM | Town & Country A
Fast kV-switching and dual-layer flat panel detector enabled CBCT joint spectral imaging
Author(s): Hao Zhou, Li Zhang, Hewei Gao, Tsinghua Univ. (China)

12463-45 • 2:50 PM - 3:10 PM | Town & Country A
Multi-constrained multi-material decomposition for dual energy CBCT
Author(s): Qian Wang, Huiqiao Xie, Tonghe Wang, Justin R. Roper, Xiangyang Tang, Jeffrey D. Bradley, Tian Liu, Xiaofeng Yang, Emory Univ. (United States)

CONFERENCE 12463

SESSION 9: BREAST TOMOGRAPHY AND DIGITAL TRIALS

22 February 2023 • 3:40 PM - 6:00 PM | Town & Country A

Session Chairs: Anders Tingberg, Skåne Univ. Hospital (Sweden), Ioannis Sechopoulos, Radboud Univ. Medical Ctr. (Netherlands)

12463-46 • 3:40 PM - 4:00 PM | Town & Country A

A scatter correction method for contrast-enhanced digital breast tomosynthesis with a dual-layer detector

Author(s): Xiangyi Wu, Xiaoyu Duan, Hailiang Huang, Wei Zhao, Stony Brook Univ. (United States)

12463-47 • 4:00 PM - 4:20 PM | Town & Country A

Deep CNN task-based image quality assessment: Application to digital breast tomosynthesis reconstruction and denoising

Author(s): Mingjie Gao, Univ. of Michigan (United States); Mark A. Helvie, Michigan Medicine (United States); Ravi K. Samala, U.S. Food and Drug Administration (United States); Lubomir M. Hadjiyski, Michigan Medicine (United States); Jeffrey A. Fessler, Univ. of Michigan (United States); Heang-Ping Chan, Michigan Medicine (United States)

12463-48 • 4:20 PM - 4:40 PM | Town & Country A

VVBP-tensor based deep learning framework for high-attenuation artifact reduction in digital breast tomosynthesis

Author(s): Manman Zhu, Chen Wang, Zidan Wang, MingQiang Meng, Yongbo Wang, Jianhua Ma, Southern Medical Univ. (China)

12463-49 • 4:40 PM - 5:00 PM | Town & Country A

Design of an in silico imaging trial with growing breast cancer lesions: comparison between DM and DBT detectability

Author(s): Miguel A. Lago, Aunnasha Sengupta, Aldo Badano, U.S. Food and Drug Administration (United States)

12463-50 • 5:00 PM - 5:20 PM | Town & Country A

Development and application of a virtual imaging trial framework for airway quantifications via CT

Author(s): Fong Chi Ho, Duke Univ. (United States); Saman Sotoudeh-Paima, Duke Univ. School of Medicine (United States); William P. Segars, Duke Univ. (United States); Ehsan Abadi, Ehsan Samei, Duke Univ. School of Medicine (United States)

12463-51 • 5:20 PM - 5:40 PM | Town & Country A

A complete procedure to prepare virtual clinical trials in digital breast tomosynthesis

Author(s): Katrien Houbrechts, KU Leuven (Belgium); Ritisha Das, Barrett, The Honors College (United States); Machteld Keupers, Univ. Ziekenhuis Leuven (Belgium); Liesbeth Vancoillie, KU Leuven (Belgium); Lesley Cockmartin, Nicholas Marshall, Hilde Bosmans, Univ. Ziekenhuis Leuven (Belgium)

12463-52 • 5:40 PM - 6:00 PM | Town & Country A

A dense search challenge phantom fabricated with pixel-based 3D printing for precise detectability assessment

Author(s): Scott S. Hsieh, Mayo Clinic (United States); Kai Mei, Nadav Shapira, Univ. of Pennsylvania (United States); Picha Shunhavanich, Chulalongkorn Univ. (Thailand); Joseph W. Stayman, Johns Hopkins Univ. (United States); Cynthia H. McCollough, Mayo Clinic (United States); Grace J. Gang, Johns Hopkins Univ. (United States); Shuai Leng, Mayo Clinic (United States); Michael Geagan, Univ. of Pennsylvania (United States); Lifeng Yu, Mayo Clinic (United States); Peter B. Noël, Univ. of Pennsylvania (United States)

POSTERS-WEDNESDAY

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12463-70

ListmodeCNN: deep learning-based PET list-mode image reconstruction

Author(s): Rui Hu, Yingying Li, Huafeng H. Liu, Zhejiang Univ. (China)

12463-71

Experimental study for discrimination between iodine and sucrose using photon counting CT assuming malignant or benign tumor

Author(s): Kazuma Yokoi, Shinichi Kojima, Isao Takahashi, FUJIFILM Healthcare Corp. (Japan)

12463-72

Generation of training dataset for deep-learning noise reduction

Author(s): Jiang Hsieh, Independent Consultant (United States)

12463-73

PET image reconstruction with parallax correction based on a distance-driven deep neural network

Author(s): Yiming Wan, Xinrui Gao, Jingwan Fang, Huafeng Liu, Zhejiang Univ. (China); Kuang Gong, Gordon Ctr. for Medical Imaging (United States)

12463-74

DeepImageTranslator V2: analysis of multimodal medical images using semantic segmentation maps generated through deep learning

Author(s): En Zhou Ye, En Hui Ye, Blyth Academy (Canada); Run Zhou Ye, Princess Margaret Cancer Ctr. (Canada)

12463-75

Unpaired learning with a data-dependent noise-generative model for low-dose CT sinogram restoration

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Development of a spatial-spectral phantom for evaluation of vascular CT imaging

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First-generation clinical dual-source photon-counting CT: quantitative and ultra-high-resolution spectral imaging

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Reducing dose in renal perfusion CT scans: the effects on quantitative imaging features for patients of different sizes

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Annual medical physics compliance testing of a Photon Counting CT scanner in comparison to other state-of-the-art scanners

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Enhancing stent visibility using multi-energy subtraction x-ray imaging

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MRI knee imaging with flexible metasurface

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Acquisition of blockwise truncated and non-truncated bi-plane C-arm data for CBCT volume-of-interest imaging

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Extraction of alveolar walls in 3D lung micro-images from large-field synchrotron radiation micro-CT using U-Net

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Penalty-driven enhanced self-supervised learning (Noise2Void) for CBCT denoising

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Corrections to Bremsstrahlung spectra for a hyperspectral x-ray detector

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Experimental optimization of photon-counting dual-energy thoracic imaging

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2D versus 3D comparison of angiographic imaging biomarkers using computational fluid dynamics simulations of contrast injections

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Spatial dependency of multiplanar reconstruction in digital breast tomosynthesis

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Smoothing-parameter tuning for regularized PET image reconstruction using deep learning

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Low-dose dual-tracer PET image reconstruction based on attention mechanism

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A dual-layer direct/indirect flat panel detector for improved material decomposition: first studies of the indirect layer

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12463-94

Millimeter wave radar-based motion monitoring method in magnetic resonance imaging system

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3D-GAN to generate representative and realistic three-dimensional breast cancer models for virtual clinical trial applications

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An anatomic clutter phantom for lung-ventilation-imaging studies

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An iOS smartphone-based surface guided radiation therapy application for monitoring motion in radiation oncology

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Physics-informed multi-modal imaging-based material characterization for proton therapy

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In vivo proton range validation using pseudo proton radiography

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Optimization of MV-kV dual-energy CT imaging for tomographic therapy

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First evaluation of 3D measurements of the compressed breast shape for digital breast tomosynthesis in the medio-lateral oblique view

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Computational method to artificially insert clusters of microcalcifications in digital breast tomosynthesis

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A motion-level-aware denoising framework for x-ray fluoroscopic images

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Direct reconstruction and separation for triple-tracer PET imaging based on three-dimensional encoder-decoder network

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12463-105

PKAID-Net: prior knowledge aware iterative denoising neural network for photon counting detector CT

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An experimentally validated simulation model of a two-bin flat-panel cadmium telluride photon-counting detector for spectroscopic breast imaging applications

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A novel method of measuring the presampling 2D-MTF of a digital imaging system

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Assessing the applicability of a learning-based method for quantitative phase retrieval from propagation-based x-ray phase contrast images under benchtop conditions

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Characterization of a carbon nanotube x-ray source array for a multisource CBCT

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Eye-lens dose reduction using Region of Interest (ROI) attenuators in neuroimaging

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Impact of non-Gaussian noise properties, not characterized by the noise power spectrum, on CT noise texture

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Mass density estimation based on single-energy computed tomography via deep learning

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Utility of phantom-based testing for evaluating the performance of AI in MRI image reconstruction

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Comparing multi-view synthetic radiography derived from tomosynthesis with standard bitewing radiography

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Accurate image reconstruction in dual-energy CT with limited-angular-range data from completely non-overlapping scanning arcs

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Support-based extended field-of-view CT reconstruction for radiation treatment planning

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System matrix approach for attenuation compensation in photoacoustic tomography

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Nanomaterials and nanotechnologies for diagnostic imaging: a review

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MMD-Net: multi-material decomposition network for high quality dual-energy CT imaging

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Anatomy registration via patient sensing for chest x-ray digital tomosynthesis

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Deep learning volumetric brain segmentation based on spectral CT

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Low-dose CT imaging performance of U-Net for varied spatial resolutions

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Dual-domain modulation for high-performance multi-geometry low-dose CT image reconstruction

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Robust multi-institution low-dose CT imaging with semi-supervised federated learning network

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Spectral CT denoising using a conditional Wasserstein generative adversarial network

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Deep learning based "All-in-One" combined visualization strategy for disease screening in CT imaging

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Noise-conscious explicit weighting network for robust low-dose CT imaging

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VVBP-tensor based deep neural network for metal artifact reduction in computed tomography

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Bayesian ensemble learning with denoiser pool for low-dose CT reconstruction

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Self-attention network for weak-supervised learning multi-material decomposition in dual energy CT

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Adaptive semi-supervised learning material estimation network in dual-energy CT

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Sparse constraint based iterative estimation of effective atomic number and electron density for dual energy CT

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Charge integration-based pulse pileup correction in photon counting detectors

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K-edge photon counting CT imaging using a dual-bin photon counting detector and kV switching

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Analytic helical cone-beam artifact reduction for CT

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A novel single-cell ion chambered AEC to reduce exposure dose for spot image acquisition in R&F applications

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Reverberant magnetic resonance elastography

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Multi-energy CT material decomposition using Bayesian deep convolutional neural network with explicit penalty of uncertainty and bias

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Clinician-interactive AI for RECIST measurements in CT imaging

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Improvements in dose efficiency with high resolution scan modes in photon counting CT

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A study on the accuracy of polynomial fitting for direct computation of material lengths from projection data in dual energy CT

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PixelPrint: a collection of three-dimensional CT phantoms of different respiratory diseases

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Improving the quality of dental crown using a transformer-based method

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Model-based deep learning to achieve interpretable spectral CT denoising

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Thermal analysis and electron beam optics for a rotating cylindrical anode based distributed x-ray source

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A new method to experimentally measure patient-specific and local Noise Power Spectrum (NPS) from a single CT data acquisition

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Bayesian optimization of laser-Compton x-ray sources for medical imaging applications

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Parameter selection for convex optimization time calibration for a 2-panel PET system

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In-line stationary multi-source tomosynthesis for high throughput 3D x-ray inspection: a simulation study

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Respiratory motion correction of whole-body PET images using a deep learning framework incorporating spatial information

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Clinical developments of a stationary head CT using CNT x-ray source arrays

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In silico tools for evaluating super-resolution and denoising algorithms applied to radiographic images

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Deep-QC: a quality-check framework for quantitative material estimation from single-kV CT data

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Hybrid a-Se/RD53B CMOS detector: initial studies

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Automatic quality control in computed tomography volumes segmentation using a small set of XCAT as reference images

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Automated animation pipeline for visualizing in silico tumor growth models

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Assessment of projection interpolation to compensate for the increased radiation dose in DBTMI

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Performance assessment of a focussed gamma probe using Monte Carlo simulations

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An edge-preserving mean curvature regularization for CT reconstruction

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Development of an iterative method for the geometric calibration of a photon counting detector-based cone beam CT system

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Evaluation of low-contrast detectability of photon-counting-detector CT using Channelized Hotelling Observer and an ACR accreditation phantom

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Evaluating the feasibility of using reduced scan length for non-contrast CT during image-guided liver ablations

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Material decomposition for photon-counting CT using a flux-independent neural network

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Analytical spectral modeling of a high-resolution CZT detector for photon-counting CT

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Experimental dual-kV reconstructions of objects containing metal using the cOSSCIR algorithm

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Dose evaluation of simultaneous breast radiography and mechanical imaging

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Electrical crosstalk noise assessment in CMOS image sensors for medical images

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A comparison of digital-based CNT & analogue-based filament X-ray source in regard to intraoperative specimen X-ray system's development

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A portable X-ray source based on CNT for Chest Radiography

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A feasibility comparison of chest tomosynthesis system with thermionic filament and carbon nanotube field emitter-based X-ray sources

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Operation of multi-beam compact tomosynthesis system using carbon nanotube emitters

Author(s): Jinho Choi, Kyung Hee Univ. (Republic of Korea); Jaeik Jung, CAT Beam Tech Co., Ltd. (Republic of Korea); Moonkyoo Kong, Jehwang Ryu, Kyung Hee Univ. (Republic of Korea)

12463-172

Deep learning CT image restoration using system blur models

Author(s): Yijie Yuan, Johns Hopkins Univ. (United States); Grace J. Gang, Univ. of Pennsylvania (United States); Joseph W. Stayman, Johns Hopkins Univ. (United States)

12463-173

Carbon nanotube x-ray tube with bipolar operation for dental application

Author(s): Jongmin Lim, Amar Prasad Gupta, Kyung Hee Univ. (Republic of Korea); Mrinal Bhusal Sharma, CAT Beam Tech Co., Ltd. (Republic of Korea); Seung Jun Yeo, Kyung Hee Univ. (Republic of Korea), CAT Beam Tech Co., Ltd. (Republic of Korea); Jeung Sun Ahn, Jehwang Ryu, Kyung Hee Univ. (Republic of Korea)

12463-174

Is two better than one? Super resolution for dual-layer radiography with convolutional neural networks

Author(s): Huay Din, Case Western Reserve Univ. (United States); Sen Wang, Adam Wang, Stanford Univ. (United States)

12463-175

Development of reflective type digital cell irradiation system based on carbon nanotube for biological research of low-dose radiation

Author(s): Hanna Lee, Jinho Choi, Amar Prasad Gupta, Kyung Hee Univ. (Republic of Korea); Jaeik Jung, Jaekyu Jang, CAT Beam Tech Co., Ltd. (Republic of Korea); Kyung-Sik Yoon, Jehwang Ryu, Kyung Hee Univ. (Republic of Korea)

12463-176

Pulse driving of CNT cathode-based electron emitter for multi-x-ray source

Author(s): Junyoung Park, Amar Parasd Gupta, Kyung-Sik Yoon, Kyung Hee Univ. (Republic of Korea); Changwon Jeong, Kwon-Ha Yoon, Wonkwang Univ. Hospital (Republic of Korea); Seungryong Cho, KAIST (Republic of Korea); Jeung Sun Ahn, Mallory Mativenga, Jehwang Ryu, Kyung Hee Univ. (Republic of Korea)

12463-177

Carbon nanotube emitter x-ray source for high-resolution micro-computed tomography

Author(s): Wooseob Kim, Jeung Sun Ahn, Jehwang Ryu, Kyung Hee Univ. (Republic of Korea)

12463-178

Multi-modality GLCM image texture features for tissue classification and detection models

Author(s): Diego Andrade, Howard Gifford, Mini Das, Univ. of Houston (United States)

12463-179

Spectral correction using dual-material signal-to-thickness calibration for CeTe photon counting detectors

Author(s): Juan C. R. Luna, Mini Das, Univ. of Houston (United States)

12463-180

Development of a dynamic phantom for near infra-red optical and x-ray computed tomographic brain imaging

Author(s): Anthony Donaldson, Diego Andrade, Juan C. R. Luna, Mini Das, Univ. of Houston (United States)

12463-7

Bone suppression technique for multidirectional dynamic chest radiography: a virtual imaging trial

Author(s): Futa Goshima, Rie Tanaka, Kanazawa Univ. (Japan); William P. Segars, Ehsan Abadi, Ehsan Samei, Carl E. Ravin Advanced Imaging Labs., Duke Univ. (United States)

12463-19

Towards appropriate use of test phantoms in training deep learning models for mammographic image conversion

Author(s): Zahra Ghanian, Andreu Badal, Nicholas A. Petrick, Berkman Sahiner, U.S. Food and Drug Administration (United States)

THURSDAY 23 FEBRUARY

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A
Seeing and feeling in robot-assisted surgery
(Keynote Presentation)
Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A
Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)
Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: PET/SPECT RECONSTRUCTION

23 February 2023 • 10:30 AM - 12:10 PM | Town & Country A
 Session Chairs: Shiva Abbaszadeh, Univ. of California, Santa Cruz (United States), Jinyi Qi, Univ. of California, Davis (United States)

12463-53 • 10:30 AM - 10:50 AM | Town & Country A
Development and task-based evaluation of a scatter-window projection and deep learning-based transmission-less attenuation compensation method for myocardial perfusion SPECT
Author(s): Zitong Yu, Md Ashequr Rahman, Washington Univ. in St. Louis (United States); Craig K. Abbey, University of California Santa Barbara (United States); Barry A. Siegel, Abhinav K. Jha, Washington Univ. in St. Louis (United States)

12463-54 • 10:50 AM - 11:10 AM | Town & Country A
Super-resolution reconstruction of γ-ray CT images for PET-enabled dual-energy CT imaging
Author(s): Yansong Zhu, Benjamin A. Spencer, Zhaoheng Xie, Univ. of California, Davis (United States); Edwin K. Leung, United Imaging Healthcare Co., Ltd. (United States); Reimund Bayerlein, Negar Omidvari, Simon R. Cherry, Jinyi Qi, Ramsey D. Badawi, Guobao Wang, Univ. of California, Davis (United States)

12463-55 • 11:10 AM - 11:30 AM | Town & Country A
MR guided PET image denoising based on denoising diffusion probabilistic model and data consistency constraint
Author(s): Kuang Gong, Gordon Ctr. for Medical Imaging (United States)

12463-56 • 11:30 AM - 11:50 AM | Town & Country A
Optimal dynamic step and shoot temporal design for quantitative multi-organ dynamic PET imaging
Author(s): Suya Li, Richard Laforest, Timothy Whitehead, Yuan-Chuan Tai, Kooresh Shoghi, Washington Univ. in St. Louis (United States)

12463-57 • 11:50 AM - 12:10 PM | Town & Country A
Memory-efficient self-supervised learning of null space projection operators
Author(s): Albert J. Zhai, Joseph Kuo, Mark A. Anastasio, Univ. of Illinois (United States); Umberto Villa, Washington Univ. in St. Louis (United States)

Lunch Break 12:10 PM - 1:10 PM

SESSION 11: CT NOISE REDUCTION AND IMAGE QUALITY & AI/ML

23 February 2023 • 1:10 PM - 3:10 PM | Town & Country A
Session Chairs: John M. Sabol, Konica Minolta Healthcare Americas, Inc. (United States), Behrouz Shabestari, National Institute of Biomedical Imaging and Bioengineering (United States)

12463-58 • 1:10 PM - 1:30 PM | Town & Country A
Contrast- and noise-dependent spatial resolution measurement for deep convolutional neural network-based noise reduction in CT using patient data
Author(s): Zhongxing Zhou, Hao Gong, Scott S. Hsieh, Cynthia H. McCollough, Lifeng Yu, Mayo Clinic (United States)

12463-64 • 1:30 PM - 1:50 PM | Town & Country A
Patient-specific uncertainty and bias quantification of non-transparent convolutional neural network model through knowledge distillation and Bayesian deep learning
Author(s): Hao Gong, Lifeng Yu, Shuai Leng, Scott S. Hsieh, Joel G. Fletcher, Cynthia H. McCollough, Mayo Clinic (United States)

12463-60 • 1:50 PM - 2:10 PM | Town & Country A
Unsupervised learning of robust models for cardiac and photon-counting X-ray CT denoising
Author(s): Darin P. Clark, Fides R. Schwartz, Duke Univ. Medical Ctr. (United States); André Euler, Victor Mergen, Hatem Alkadhi, UniversitätsSpital Zürich (Switzerland); Daniele Marin, Cristian T. Badea, Duke Univ. Medical Ctr. (United States)

12463-61 • 2:10 PM - 2:30 PM | Town & Country A
Task-driven CT image quality optimization for low-contrast lesion detectability with tunable neural networks
Author(s): Matthew Tivnan, Johns Hopkins Univ. (United States); Tzu-Cheng Lee, Ruoqiao Zhang, Canon Medical Research USA, Inc. (United States); Kirsten Boedeker, Canon Medical Systems Corp. (Japan); Liang Cai, Canon Medical Research USA, Inc. (United States); Jeremias Sulam, J. Webster Stayman, Johns Hopkins Univ. (United States)

12463-62 • 2:30 PM - 2:50 PM | Town & Country A
Addressing the challenge of CT number bias in low-dose photon counting CT without access to raw detector count data
Author(s): Dalton Griner, Nikou Lei, Guang-Hong Chen, Ke Li, Univ. of Wisconsin School of Medicine and Public Health (United States)

12463-63 • 2:50 PM - 3:10 PM | Town & Country A
Bench testing performance of deep learning-based CT image denoising methods: influence of object background on image sharpness and noise texture
Author(s): Rongping Zeng, Prabhat KC, Brandon Nelson, U.S. Food and Drug Administration (United States)

Coffee Break 3:10 PM - 3:40 PM

CONFERENCE 12463

23 February 2023 • 3:40 PM - 5:40 PM | Town & Country A

Session Chairs: Shuai Leng, Mayo Clinic (United States), Seungryong Cho, KAIST (Republic of Korea)

12463-59 • 3:40 PM - 4:00 PM | Town & Country A

Unbiased zero-count correction in low-dose photon counting CT

Author(s): Daniel H. Bushe, Ran Zhang, Guang-Hong Chen, Ke Li, Univ. of Wisconsin School of Medicine and Public Health (United States)

12463-65 • 4:00 PM - 4:20 PM | Town & Country A

Semi-centralized federated learning network for low-dose CT imaging

Author(s): Danyang Li, Hao Wang, Jiangyi Liao, MingQiang Meng, Cuidie Zeng, Southern Medical Univ. (China); Yuting Wang, Sun Yat-Sen Univ. Cancer Ctr. (China); Dong Zeng, Jianhua Ma, Southern Medical Univ. (China)

12463-66 • 4:20 PM - 4:40 PM | Town & Country A

Harmonizing CT images via physics-based deep neural networks

Author(s): Mojtaba Zarei, Saman Sotoudeh-Paima, Cindy McCabe, Ehsan Abadi, Ehsan Samei, Duke Univ. (United States)

12463-67 • 4:40 PM - 5:00 PM | Town & Country A

Cardiac phase estimation using deep learning analysis of pulsed-mode projections: towards autonomous cardiac CT imaging

Author(s): Pengwei Wu, Jed D. Pack, Eri Haneda, Isabelle Heukensfeldt Jansen, Bernhard Claus, GE Research (United States); Albert Hsiao, Elliot McVeigh, Univ. of California, San Diego (United States); Bruno De Man, GE Research (United States)

12463-68 • 5:00 PM - 5:20 PM | Town & Country A

Dual-domain projection fidelity network for sparse-view helical CT reconstruction

Author(s): Zerui Mao, Yongbo Wang, Southern Medical Univ. (China); Gaofeng Chen, Guangdong Artificial Intelligence and Digital Economy Lab. (Guangzhou) (China); Manman Zhu, MingQiang Meng, Zhaoying Bian, Dong Zeng, Jianhua Ma, Southern Medical Univ. (China)

12463-69 • 5:20 PM - 5:40 PM | Town & Country A

MB-DECTNet: a model-based unrolled network for accurate 3D DECT reconstruction

Author(s): Tao Ge, Maria Medrano, Rui Liao, David G. Politte, Jeffrey F. Williamson, Washington Univ. in St. Louis (United States); Bruce R. Whiting, Univ. of Pittsburgh (United States); Joseph A. O'Sullivan, Washington Univ. in St. Louis (United States)

19 February 2023 • 8:00 AM - 8:00 AM | On Demand

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12463-30

Effects of x-ray excitation voltage on X-SWIR intensity and x-ray dose

Author(s): Wangyang Li, PLA Air Force Military Medical Univ. (China); Wenqing Hao, PLA Air Force Military Medical Univ. (China), Xidian Univ. (China); Ruijing LI, Tianshuai Liu, Junyan Rong, Wenli Zhang, Hongbing Lu, PLA Air Force Military Medical Univ. (China)

12463-80

Comparison of two simulation methods in x-ray-grating-based dark-field imaging for lung tissues

Author(s): Peiyuan Guo, Li Zhang, Hewei Gao, Yuxiang Xing, Zhentian Wang, Zhiqiang Chen, Tsinghua Univ. (China)

12463-65

Semi-centralized federated learning network for low-dose CT imaging

Author(s): Danyang Li, Hao Wang, Jiangyi Liao, MingQiang Meng, Cuidie Zeng, Southern Medical Univ. (China); Yuting Wang, Sun Yat-Sen Univ. Cancer Ctr. (China); Dong Zeng, Jianhua Ma, Southern Medical Univ. (China)

12463-149

In-line stationary multi-source tomosynthesis for high throughput 3D x-ray inspection: a simulation study

Author(s): Sunghoon Choi, Jin-Woo Jeong, Jae-Woo Kim, Jun-Tae Kang, Sora Park, Eunsol Go, Jeong-Woong Lee, Yujung Ahn, Yoon-Ho Song, Electronics and Telecommunications Research Institute (Korea, Republic of)

CONFERENCE 12464

Image Processing

19–23 February 2023 | Town & Country B

Conference Chairs: **Olivier Colliot,** Ctr. National de la Recherche Scientifique (France); **Ivana Išgum,** Amsterdam UMC (Netherlands)

Program Committee: **Elsa D. Angelini,** Imperial College London (United Kingdom); **Meritxell Bach-Cuadra,** Univ. de Lausanne (Switzerland); **Ulas Bagci,** Northwestern Univ. (United States); **Niha G. Beig,** Tempus Labs Inc. (United States); **Katharina Breininger,** Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); **Esther E. Bron,** Erasmus MC (Netherlands); **Ninon Burgos,** Institut du Cerveau et de la Moelle Épinière (France); **Antong Chen,** Merck & Co., Inc. (United States); **Tolga Çukur,** Bilkent Univ. (Turkey); **Benoit M. Dawant,** Vanderbilt Univ. (United States); **Marleen de Bruijne,** Erasmus MC (Netherlands); **Damini Dey,** Cedars-Sinai Medical Ctr. (United States); **Lotta Maria Ellingsen,** Univ. of Iceland (Iceland); **Alexandre X. Falcão,** Univ. of Campinas (Brazil); **Aaron Fenster,** Robarts Research Institute (Canada); **James Fishbaugh,** NYU Tandon School of Engineering (United States); **Alejandro F. Frangi,** Univ. of Leeds (United Kingdom); **Yu Gan,** The Univ. of Alabama (United States); **Mona K. Garvin,** The Univ. of Iowa (United States); **James C. Gee,** Univ. of Pennsylvania (United States); **Miguel Angel González Ballester,** Univ. Pompeu Fabra (Spain); **Hayit Greenspan,** Tel Aviv Univ. (Israel); **David R. Haynor,** Univ. of Washington (United States); **Tobias Heimann,** Siemens Healthineers (Germany); **Bulat Ibragimov,** Univ. of Copenhagen (Denmark); **Leigh Johnston,** The Univ. of Melbourne (Australia); **Jayashree Kalpathy-Cramer,** Athinoula A. Martinos Ctr. for Biomedical Imaging (United States); **Stefan Klein,** Erasmus MC (Netherlands); **Susana K. Lai-Yuen,** Univ. of South Florida (United States); **Bennett A. Landman,** Vanderbilt Univ. (United States); **Carole Lartizien,** CREATIS (France); **Tianhu Lei,** Univ. of Pittsburgh (United States); **Tim Leiner,** Univ. Medical Ctr. Utrecht (Netherlands); **Karim Lekadir,** Univ. de Barcelona (Spain); **Boudewijn P. F. Lelieveldt,** Leiden Univ. Medical Ctr. (Netherlands); **Natasha Lepore,** Children's Hospital Los Angeles (United States); **Murray H. Loew,** The George Washington Univ. (United States); **Cristian Lorenz,** Philips Research (Germany); **Frederik Maes,** KU Leuven (Belgium); **Ana Maria Marques da Silva,** PUCRS-IPCT (Brazil); **Diana Mateus,** Ecole Centrale de Nantes (France); **Jhimli Mitra,** GE Research (United States); **Marc Modat,** King's College London (United Kingdom); **Albert Montillo,** The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); **Kensaku Mori,** Nagoya Univ. (Japan); **Mads Nielsen,** Univ. of Copenhagen (Denmark); **Ipek Oguz,** Vanderbilt Univ. (United States); **Tingying Peng,** Helmholtz Zentrum München GmbH (Germany); **Dzung L. Pham,** Henry M. Jackson Foundation (United States); **Juan Carlos Prieto,** The Univ. of North Carolina at Chapel Hill (United States); **Jerry L. Prince,** Johns Hopkins Univ. (United States); **Xin Qi,** Rutgers, The State Univ. of New Jersey (United States); **Nishant Ravikumar,** Univ. of Leeds (United Kingdom); **Maryam E. Rettmann,** Mayo Clinic (United States); **Letícia Rittner,** Univ. of Campinas (Brazil); **Mirabela Rusu,** Stanford Univ. School of Medicine (United States); **Punam K. Saha,** The Univ. of Iowa (United States); **Rachel E. Sparks,** King's College London (United Kingdom); **Marius Staring,** Leiden Univ. Medical Ctr. (Netherlands); **Joshua Victor Stough,** Bucknell Univ. (United States); **Martin A. Styner,** The Univ. of North Carolina at Chapel Hill (United States); **Kenji Suzuki,** Tokyo Institute of Technology (Japan); **Tanveer F. Syeda-Mahmood,** IBM Research - Almaden (United States); **Zeike A. Taylor,** Univ. of Leeds (United Kingdom); **Yubing Tong,** Univ. of Pennsylvania (United States); **Jayaram K. Udupa,** Univ. of Pennsylvania (United States); **Koen Van Leemput,** Harvard Medical School (United States); **Tomaž Vrtovec,** Univ. of Ljubljana (Slovenia); **Wolfgang Wein,** ImFusion GmbH (Germany); **Guang Yang,** National Heart and Lung Institute (United Kingdom); **Jonghye Woo,** Massachusetts General Hospital (United States); **Maria A. Zuluaga,** EURECOM (France)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: **Symposium Chair Welcome and Best Student Paper Award Announcement**

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

5:40 pm: **New SPIE Fellows Acknowledgments**

5:45 pm: **SPIE Harrison H. Barrett Award in Medical Imaging**
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments
(Plenary Presentation)
Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement**

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

CONFERENCE 12464

20 February 2023 • 10:30 AM - 11:50 AM | Town & Country B
Session Chairs: Murray H. Loew, The George Washington Univ. (United States), Mads Nielsen, Univ. of Copenhagen (Denmark)

12464-1 • 10:30 AM - 10:50 AM | Town & Country B
Anatomy-specific acquisition-agnostic affine registration learned from fictitious images
Author(s): Malte Hoffmann, Harvard Medical School (United States), Massachusetts General Hospital (United States); Andrew Hoopes, Massachusetts Institute of Technology (United States), Massachusetts General Hospital (United States); Bruce Fischl, Adrian V. Dalca, Harvard Medical School (United States), Massachusetts General Hospital (United States), Massachusetts Institute of Technology (United States)

12464-2 • 10:50 AM - 11:10 AM | Town & Country B
Patch-RegNet: a hierarchical deformable registration framework for inter-/intra-modality head-and-neck image registration with ViT-Morph
Author(s): Yao Zhao, Xinru Chen, Brigid McDonald, Cenji Yu, Laurence Edward Court, Tinsu Pan, He Wang, Xin Wang, UTHealth Houston Graduate School of Biomedical Sciences (United States), The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Jack Phan, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Jinzhong Yang, UTHealth Houston Graduate School of Biomedical Sciences (United States), The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12464-3 • 11:10 AM - 11:30 AM | Town & Country B
A multiscale algorithm for computing realistic image transformation: application to the modelling of fetal brain growth
Author(s): Fleur Gaudfernau, Stéphanie Allassonière, Univ. Paris Cité (France); Erwan Le Pennc, Institut Polytechnique de Paris (France)

12464-124 • 11:30 AM - 11:50 AM | Town & Country B
Shape analysis of amygdala atrophy using SPHARM-OT
Author(s): Zexuan Wang, Jiong Chen, Wenxi Yang, Sumita Gara, Frederick Xu, Junhao Wen, Christos Davatzikos, Li Shen, Univ. of Pennsylvania (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: CLASSIFICATION AND SEGMENTATION

20 February 2023 • 1:20 PM - 3:00 PM | Town & Country B
Session Chairs: Susana K. Lai-Yuen, Univ. of South Florida (United States), Kensaku Mori, Nagoya Univ. (Japan)

12464-5 • 1:20 PM - 1:40 PM | Town & Country B
An auxiliary attention-based network for joint classification and localization of breast tumor on ultrasound images
Author(s): Zong Fan, Univ. of Illinois (United States); Ping Gong, Shanshan Tang, Christine U. Lee, Mayo Clinic (United States); Xiaohui Zhang, Zhimin Wang, Pengfei Song, Univ. of Illinois (United States); Shigao Chen, Mayo Clinic (United States); Hua Li, Washington Univ. in St. Louis (United States)

12464-6 • 1:40 PM - 2:00 PM | Town & Country B
Stratification of lung cancer risk with thoracic imaging phenotypes
Author(s): Kaiwen Xu, Vanderbilt Univ. (United States); Mirza S. Khan, Vanderbilt Univ. Medical Ctr. (United States); Thomas Z. Li, Riqiang Gao, Vanderbilt Univ. (United States); Sanja L. Antic, Vanderbilt Univ. Medical Ctr. (United States); Yuankai Huo, Vanderbilt Univ. (United States); Kim L. Sandler, Fabien Maldonado, Vanderbilt Univ. Medical Ctr. (United States); Bennett A. Landman, Vanderbilt Univ. (United States)

12464-53 • 2:00 PM - 2:20 PM | Town & Country B
Analyzing components of a transformer under different dataset scales in 3D prostate CT segmentation
Author(s): Yicong Tan, Technische Univ. Delft (Netherlands); Prerak Mody, Viktor van der Valk, Marius Staring, Leiden Univ. Medical Ctr. (Netherlands); Jan van Gemert, Technische Univ. Delft (Netherlands)

12464-8 • 2:20 PM - 2:40 PM | Town & Country B
Estimation of the ankle-joint space visibility in X-ray images using convolutional neural networks
Author(s): Johannes Köpnick, Jan Marek May, Bernd Lundt, Philips Medizin Systeme GmbH (Germany); Matthias Brück, Philips Research (Germany); Christian Wülker, Philips GmbH Innovative Technologies (Germany)

12464-9 • 2:40 PM - 3:00 PM | Town & Country B
Weakly supervised airway orifice segmentation in video bronchoscopy
Author(s): Ron Keuth, Mattias Heinrich, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany); Martin Eichenlaub, Universitätsklinikum Freiburg (Germany); Marian Himstedt, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: CARDIOVASCULAR APPLICATIONS

20 February 2023 • 3:30 PM - 4:50 PM | Town & Country B
Session Chairs: Letícia Rittner, Univ. of Campinas (Brazil), Nishant Ravikumar, Univ. of Leeds (United Kingdom)

12464-10 • 3:30 PM - 3:50 PM | Town & Country B
Combining arterial and venous CT scans in a multi-encoder network for improved hepatic vessel segmentation
Author(s): Felix Thielke, Farina Kock, Annika Hänsch, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany); Nasreddin Abolmaali, Ruhr-Univ. Bochum (Germany); Andrea Schenk, Hans Meine, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)
Show Abstract +

12464-11 • 3:50 PM - 4:10 PM | Town & Country B
Automated coronary artery calcium segmentation in cardiac CT using combined probability map and feature analysis – A preliminary report
Author(s): Raisa B. Rasul, Cornell Univ. (United States); Morteza Naghavi, American Heart Technologies (United States); Matthew J. Budoff, The Lundquist Institute (United States); Anthony P. Reeves, Cornell Univ. (United States)

12464-12 • 4:10 PM - 4:30 PM | Town & Country B
Comparative analysis between convolutional long short-term memory networks and vision transformers for coronary calcium scoring in non-contrast CT
Author(s): Aakash Dhananjay Shanbhag, Konrad Pieszko, Cedars-Sinai Medical Ctr. (United States); Robert J. H. Miller, Univ. of Calgary (Canada); Aditya Killekar, Waechter Parker, Heidi Gransar, Cedars-Sinai Medical Ctr. (United States); Michelle Williams, British Heart Foundation Ctr. for Cardiovascular Science, The Univ. of Edinburgh (United Kingdom); Daniel S. Berman, Damini Dey, Piotr J. Slomka, Cedars-Sinai Medical Ctr. (United States)

12464-14 • 4:30 PM - 4:50 PM | Town & Country B
Semi-supervised vessel wall detection and segmentation from 3D femoral MR images
Author(s): Qinhong Yan, Bernard Chi Yuen Chiu, City Univ. of Hong Kong (Hong Kong, China)

12464-15 • 4:50 PM - 5:10 PM | Town & Country B

Transferring deep convolutional network representations from SPECT to improve PET cardiac outcome prediction

Author(s): Bryan Bednarski, Aakash Dhananjay Shanbhag, Ananya Singh, Cedars-Sinai Medical Ctr. (United States); Robert J. H. Miller, Univ. of Calgary (Canada); Heidi Gransar, Keiichiro Kuronuma, Cedars-Sinai Medical Ctr. (United States); Tali Sharir, Department of Nuclear Cardiology, Assuta Medical Center (Israel); Sharmila Dorbala, Marcelo F. Di Carli, Div. of Nuclear Medicine and Molecular Imaging, Depart. of Radiology, Brigham and Women's Hospital (United States); Matthews B. Fish, Dept. of Nuclear Medicine, Oregon Heart and Vascular Institute, Sacred Heart Medical Center (United States); Terrence D. Ruddy, Division of Cardiology, University of Ottawa Heart Institute (Canada); Daniel S. Berman, Damini Dey, Piotr J. Slomka, Cedars-Sinai Medical Ctr. (United States)

<div align="center">

POSTERS-WEDNESDAY
</div>

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12464-47

Detecting human gastric peristalsis using magnetically controlled capsule endoscope via deep learning

Author(s): Xueshen Li, Yu Gan, Stevens Institute of Technology (United States); David Duan, Xiao Yang, Anx Robotica (United States)

12464-48

Unsupervised quality assurance for brain MR image rigid registration using latent shape representation

Author(s): Yuan Xue, Lianrui Zuo, Samuel W. Remedios, Johns Hopkins Univ. (United States); Blake E. Dewey, Johns Hopkins Medicine (United States); Peiyu Duan, Yihao Liu, Rendong Zhang, Johns Hopkins Univ. (United States); Scott Newsome, Ellen Mowry, Johns Hopkins Medicine (United States); Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-49

Transfer learning from synthetic to routine clinical data for motion artefact detection in brain T1-weighted MRI

Author(s): Sophie Loizillon, Simona Bottani, Institut du Cerveau et de la Moelle Épinière, CNRS (France), Sorbonne Univ. (France); Aurélien Maire, Sebastian Ströer, Didier Dormont, Assistance Publique Hôpitaux de Paris (France); Olivier Colliot, Ninon Burgos, Institut du Cerveau et de la Moelle Épinière, CNRS (France), Sorbonne Univ. (France)

12464-52

An extensive pixel-level augmentation framework for unsupervised cross-modality domain adaptation

Author(s): Maria Gabriela Baldeon Calisto, Univ. San Francisco de Quito (Ecuador); Susana K. Lai-Yuen, Univ. of South Florida (United States)

12464-54

Introducing soft topology constraints in deep learning-based segmentation using projected pooling loss

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12464-55

Shape analysis of ossicular chain based on hyperbolic Ricci flow

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12464-56

Adjoint operators enable fast and amortized machine learning based Bayesian uncertainty quantification

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12464-57

Implementation of deep learning algorithms for automatic MRI segmentation and fat fraction quantification in individual muscles

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12464-58

Integrative risk predictors of temporomandibular joint osteoarthritis progression

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12464-59

A study of attention information from transformer layers in hybrid medical image segmentation networks

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12464-60

Stable classification of diabetic structures from incorrectly labeled OCTA en face images using multi instance learning

Author(s): Philipp Matten, Julius Scherer, Thomas Schlegl, Jonas Nienhaus, Heiko Stino, Andreas Pollreisz, Wolfgang Drexler, Rainer A. Leitgeb, Medizinische Univ. Wien (Austria); Tilman Schmoll, Medizinische Univ. Wien (Austria), Carl Zeiss Meditec, Inc. (United States)

12464-61

A slice classification neural network for automated classification of axial PET/CT slices from a multi-centric lymphoma dataset

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12464-63

Smooth manifold extraction for 2D synthetic radiography using 2D CNT array-based DTS system

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12464-65

A relative motion model for myocardial infarction detection

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12464-66

Image registration of diffusion weighted and conventional breast MRI

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12464-67

Towards lifting the trade-off between accuracy and adversarial robustness of deep neural networks with application on COVID 19 CT image classification and medical image segmentation

Author(s): Linhai Ma, Liang Liang, Univ. of Miami (United States)

12464-70

Self-supervised denoising using optimized blind-spot networks for real-time application in 4D-OCT

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12464-71

A deep learning method for pinwheel artifact reduction in CT

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12464-72

Real-time mitral annulus segmentation from 4D transesophageal echocardiography using deep learning regression

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12464-73

Multi-step reinforcement learning for medical image super-resolution

Author(s): Alix Bouffard, Ontario Tech Univ. (Canada); Mihaela Pop, Sunnybrook Research Institute (Canada); Mehran Ebrahimi, Ontario Tech Univ. (Canada)

12464-74

Characterizing visual cortical magnification with topological smoothing and optimal transportation

Author(s): Yujian Xiong, Yanshuai Tu, Arizona State Univ. (United States); Zhong-lin Lu, New York Univ. Shanghai (China), New York Univ. (United States); Yalin Wang, Arizona State Univ. (United States)

12464-75

Topography-based feature extraction of the human placenta from prenatal MR images

Author(s): James Huang, Maysam Shahedi, The Univ. of Texas at Dallas (United States); Quyen N. Do, Yin Xi, Matthew A. Lewis, Christina L. Herrera, David M. Owen, Catherine Spong, Ananth J. Madhuranthakam, Diane M. Twickler, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Baowei Fei, The Univ. of Texas at Dallas (United States)

12464-76

A deep learning based real-time needle segmentation and localization method for ultrasound-guided renal biopsy

Author(s): Minghong Duan, Xuming Zhang, Huazhong Univ. of Science and Technology (China)

12464-77

Unsupervised registration refinement for generating unbiased eye atlas

Author(s): Ho Hin Lee, Yucheng Tang, Shunxing Bao, Qi Yang, Xin Yu, Kevin L. Schey, Jeffery M. Spraggins, Yuankai Huo, Bennett A. Landman, Vanderbilt Univ. (United States)

12464-79

Longitudinal variability analysis on low-dose abdominal CT with deep learning-based segmentation

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12464-81

How can data augmentation improve attribution maps for disease subtype explainability

Author(s): Elina Thibeau Sutre, Jelmer M. Wolterink, Univ. Twente (Netherlands); Olivier Colliot, Ninon Burgos, Institut du Cerveau et de la Moelle Épinière (France)

12464-83

Ultrasound shear wave velocity estimation in a small field of view via spatio-temporal deep learning

Author(s): Sarah Grube, Marcel Bengs, Maximilian Neidhardt, Sarah Latus, Alexander Schlaefer, Technische Univ. Hamburg-Harburg (Germany)

12464-85

Highly accurate deep registration networks for large deformation estimation in compression ultrasound

Author(s): Laura Franziska Graf, Hanna Siebert, Univ. zu Lübeck (Germany); Sven Mischkewitz, ThinkSono GmbH (Germany); Ron Keuth, Mattias P. Heinrich, Univ. zu Lübeck (Germany)

12464-86

Mapping the impact of approximate gradient nonlinearity fields correction on tractography

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12464-87

Simulation based evaluation framework for deep learning unsupervised anomaly detection on brain FDG-PET

Author(s): Ravi Hassanaly, Simona Bottani, Benoit Sauty, Olivier Colliot, Ninon Burgos, Institut du Cerveau et de la Moelle Épinière (France)

12464-88

New starting point registration method for tagged MRI tongue motion estimation

Author(s): Jinglun Yu, Muhan Shao, Zhangxing Bian, Johns Hopkins Univ. (United States); Xiao Liang, Jiachen Zhuo, Univ. of Maryland School of Medicine (United States); Maureen Stone, Univ. of Maryland, Baltimore (United States); Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-89

Morphology-free scar screening in hypertrophic myocardium

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12464-90

Comparing voxel- and feature-wise harmonization of complex graph measures from multiple sites for structural brain network investigation of aging

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12464-92

3D body shape for regional and appendicular body composition estimation

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12464-93

Deep learning-based multi-organ CT segmentation with adversarial data augmentation

Author(s): Shaoyan Pan, Emory Univ. (United States); Shao-Yuan Lo, Johns Hopkins Univ. (United States); Min Huang, Chaoqiong Ma, Jacob Wynne, Tonghe Wang, Tian Liu, Xiaofeng Yang, Emory Univ. (United States)

12464-94

Impact of train- and test-time Hounsfield unit window variation on CT segmentation of liver lesions

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12464-95

Joint synthesis of WMn MPRAGE and parameter maps using deep learning and an imaging equation

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12464-96

Investigation of probability maps in deep-learning-based brain ventricle parcellation

Author(s): Yuli Wang, Anqi Feng, Yuan Xue, Muhan Shao, Ari Blitz, Mark Luciano, Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-97

Morphological analysis of ankle shorts bones of children with cerebral palsy: a comparative study

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12464-98

The topology-overlap trade-off in retinal arteriole-venule segmentation

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12464-99

Using a GAN for CT contrast enhancement to improve CNN kidney segmentation accuracy

Author(s): Spencer H. Welland, Gabriel Melendez-Corres, Pang Yu Teng, Heidi Coy, Muhammad Wahi-Anwar, Steve Raman, Matthew Brown, Univ. of California, Los Angeles (United States)

12464-100

Feasibility of simulated realistic textured XCAT phantoms for assessment of radiomic feature stability

Author(s): Jaryd R. Christie, Sarah A. Mattonen, Western Univ. (Canada)

12464-102

Deep learning-based image registration method: with application to Scanning Laser Ophthalmoscopy (SLO) longitudinal images

Author(s): Yuli Wang, Ji Yi, Johns Hopkins Univ. (United States)

12464-103

Quantifying velopharyngeal motion variation in speech sound production using an audio-informed dynamic MRI atlas

Author(s): Fangxu Xing, Harvard Medical School (United States), Massachusetts General Hospital (United States); Riwei Jin, Univ. of Illinois (United States); Imani Gilbert, East Carolina Univ. (United States); Georges El Fakhri, Harvard Medical School (United States); Jamie Perry, East Carolina Univ. (United States); Bradley Sutton, Univ. of Illinois (United States); Jonghye Woo, Harvard Medical School (United States)

12464-104

Octree cube constraints in PBD method for high resolution surgical simulation

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12464-105

Deep whole brain segmentation of 7T structural MRI

Author(s): Karthik Ramadass, Xin Yu, Leon Y. Cai, Yucheng Tang, Shunxing Bao, Cailey I. Kerley, Micah A. D'Archangel, Laura A. Barquero, Allen T. Newton, Isabel Gauthier, Rankin McGugin, Benoit M. Dawant, Laurie E. Cutting, Yuankai Huo, Bennett A. Landman, Vanderbilt Univ. (United States)

12464-106

Measurement of the amount of chromosome aberration through object detection

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12464-107

Semi-supervised clustering for neuro-subtyping of autism spectrum disorder

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12464-108

Segmentation and identification of fatty infiltration of the erector spinae using deep learning

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12464-109

How to overcome the data limited segmentation in abdominal CT: multi-planar UNet coupled with augmented contrast-boosting

Author(s): Sihwan Kim, Chulkyun Ahn, Jong Hyo Kim, Seoul National Univ. (Korea, Republic of), ClariPi Inc. (Korea, Republic of)

12464-111

Simultaneous wavefront and 3D tomographic reconstructions for phase imaging using Hartmann sensor

Author(s): Emile Barjou, Univ. de Bordeaux (France); Francesca Mastropietro, Benjamin Barbrel, ALPhANOV (France); Ombeline De La Rochefoucauld, Imagine Optic SA (France); Aboubakr Bakkali, ALPhANOV (France); Benoit Recur, Institute of Physics, Academia Sinica (Taiwan); Pascal Desbarats, Univ. de Bordeaux (France)

12464-112

Deep angiogram: trivializing retinal vessel segmentation

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12464-113

Deformable registration of 3D CT images with partial liver

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12464-114

Prediction of postoperative 3D spine shape using Controlled Point Deformation Network (CPDNet)

Author(s): Maryam Khani, Philippe Debanné, Polytechnique Montréal (Canada), Ctr. de Recherche, CHU Sainte-Justine (Canada); Hubert Labelle, Stefan Parent, Ctr. de Recherche, CHU Sainte-Justine (Canada); Farida Cheriet, Polytechnique Montréal (Canada), Ctr. de Recherche, CHU Sainte-Justine (Canada)

12464-115

Can a single image processing algorithm work equally well across all phases of DCE-MRI

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12464-117

Self-supervised learning enhanced ultrasound video thyroid nodule tracking

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12464-118

Resolving trabecular morphology with a deep learning model

Author(s): Trevor Chan, Chamith Rajapakse, Univ. of Pennsylvania (United States)

12464-120

Exploring timing patterns around the phase transition of the brain system using resting-state fMRI

Author(s): Junlin Guo, Nazirah Mohd Khairi, Don M. Wilkes, Vanderbilt Univ. (United States)

12464-121

Skeletal modeling of the tricuspid valve via cylindrical parameterization

Author(s): Jared Vicory, Kitware, Inc. (United States); Christian Herz, Maura Flynn, Alana Cianciulli, Patricia Sabin, The Children's Hospital of Philadelphia (United States); Andras Lasso, Queen's Univ. (Canada); Matthew A. Jolley, The Children's Hospital of Philadelphia (United States); Beatriz Paniagua, Kitware, Inc. (United States)

12464-122

Synthesis of pediatric brain tumor images with mass effect

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12464-123

Distance map supervised landmark localization for MR-TRUS registration

Author(s): Xinrui Song, Xuanang Xu, Rensselaer Polytechnic Institute (United States); Sheng Xu, National Institutes of Health (United States); Baris Turkbey, National Cancer Institute (United States); Thomas Sanford, SUNY Upstate Medical Univ. (United States); Bradford J. Wood, National Institutes of Health (United States); Pingkun Yan, Rensselaer Polytechnic Institute (United States)

12464-125

Segmenting thalamic nuclei from manifold projections of multi-contrast MRI

Author(s): Chang Yan, Muhan Shao, Zhangxing Bian, Anqi Feng, Yuan Xue, Johns Hopkins Univ. (United States); Jiachen Zhuo, Rao P. Gullapalli, Univ. of Maryland School of Medicine (United States); Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-126

Quantum entanglement for identifying true coincidences in a CZT-based PET system

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12464-127

Volumetric measurements of brain in multiple sclerosis: comparison of segmentation methods in simulated MRI data

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12464-128

Investigating the impact of class-dependent label noise in medical image classification

Author(s): Bidur Khanal, S.M. Kamrul Hasan, Rochester Institute of Technology (United States); Bishesh Khanal, NepAl Applied Mathematics and Informatics Institute for Research (Nepal); Cristian A. Linte, Rochester Institute of Technology (United States)

12464-129

Interstitial lung disease detection in CT using an ensemble method of patch CNN and radiomic classifier

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12464-130

GAN based ROI conditioned synthesis of medical image for data augmentation

Author(s): Yisak Kim, Jong Hyuk Lee, Changi Kim, Seoul National Univ. Hospital (Korea, Republic of); Kwang Nam Jin, Seoul Metropolitan Government–Seoul National University Boramae Medical Center (Kiribati, Republic of); Chang Min Park, Seoul National Univ. Hospital (Korea, Republic of)

12464-131

Dmriprep: open-source diffusion MRI quality control framework with graphical user interface

Author(s): Johanna Dubos, Univ. of North Carolina at Chapel Hill (United States); Sang Kyoon Park, Roza Vlasova, Juan C. Prieto, Martin A. Styner, The Univ. of North Carolina at Chapel Hill (United States)

12464-132

Attention-based 3D convolutional networks for detection of geographic atrophy from optical coherence tomography scans

Author(s): Amr Elsawy, National Library of Medicine, National Institutes of Health (United States); Tiarnan D. L. Kenan, National Eye Institute, National Institutes of Health (United States); Qingyu Chen, U.S. National Library of Medicine (United States); Xiaoshuang Shi, Univ. of Electronic Science and Technology of China (China); Emily Y. Chew, National Eye Institute (United States); Zhiyong Lu, U.S. National Library of Medicine (United States)

12464-133

Revisiting the supervision level in semi-supervised learning for automated tumor segmentation: application to lymphoma FDG PET imaging

Author(s): Fereshteh Yousefirizi, BC Cancer Research Institute (Canada); Joo O., Seoul St. Mary's Hospital, The Catholic Univ. of Korea (Korea, Republic of); Ingrid Bloise, Amirhosein Toosi, Carlos F. Uribe, Arman Rahmim, BC Cancer Research Institute (Canada)

12464-134

Semantic segmentation of individual muscle groups in 3D thigh MRI

Author(s): Azubuike Okorie, Sokratis Makrogiannis, Delaware State Univ. (United States); Richard W. Spencer, National Institute on Aging (United States); Rita Kalyani, Johns Hopkins Univ. (United States); Luigi Ferrucci, National Institute on Aging (United States)

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12464-135

State-of-the-art object detection algorithms for small lesion detection in PSMA PET: use of rotational maximum intensity projection (MIP) images

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12464-136

Pseudo-contrast cardiac CT angiography derived from non-contrast CT using conditional generative adversarial networks

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12464-137

Priority attention network with Bayesian learning for fully automatic segmentation of substantia nigra from neuromelanin MRI

Author(s): Tao Hu, Hayato Itoh, Masahiro Oda, Nagoya Univ. (Japan); Shinji Saiki, Nobutaka Hattori, Koji Kamagata, Shigeki Aoki, Juntendo Univ. (Japan); Kensaku Mori, Nagoya Univ. (Japan)

12464-138

Resolving impact of technical and biological variability on the convolutional neural networks: evaluating chest x-ray scans

Author(s): Dmitrii Cherezov, Vidya Sankar Viswanathan, Emory Univ. (United States); Amit Gupta, Univ. Hospitals of Cleveland (United States); Anant Madabhushi, Emory Univ. (United States)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A
ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)
Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A
Human-AI collaboration *(Keynote Presentation)*
Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:40 AM

SESSION 4: IMAGE SYNTHESIS AND GENERATIVE MODELS

21 February 2023 • 10:40 AM - 11:40 AM | Town & Country B
Session Chairs: Yu Gan, Stevens Institute of Technology (United States), Punam K. Saha, The Univ. of Iowa (United States)

12464-17 • 10:40 AM - 11:00 AM | Town & Country B
Batch size go big or go home: counterintuitive improvement in medical autoencoders with smaller batch size
Author(s): Cailey I. Kerley, Leon Y. Cai, Yucheng Tang, Vanderbilt Univ. (United States); Lori L. Beason-Held, Susan M. Resnick, National Institute on Aging (United States); Laurie E. Cutting, Bennett A. Landman, Vanderbilt Univ. (United States)

12464-18 • 11:00 AM - 11:20 AM | Town & Country B
A deep generative prior for high-resolution isotropic MR head slices
Author(s): Samuel W. Remedios, Johns Hopkins Univ. (United States), National Institutes of Health (United States); Blake E. Dewey, Aaron Carass, Johns Hopkins Univ. (United States); Dzung L. Pham, Uniform Services Univ. of the Health Sciences (United States); Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-19 • 11:20 AM - 11:40 AM | Town & Country B
3D-2D GAN based brain metastasis synthesis with configurable parameters for fully 3D data augmentation
Author(s): Gengyan Zhao, Youngjin Yoo, Thomas J. Re, Jyotipriya Das, Siemens Healthineers (United States); Hesheng Wang, New York Univ. (United States); Michelle Kim, Univ. of Michigan (United States); Colette Shen, Yueh Z. Lee, The Univ. of North Carolina at Chapel Hill (United States); Douglas Kondziolka, New York Univ. (United States); Mohannad Ibrahim, Univ. of Michigan (United States); Jun Lian, The Univ. of North Carolina at Chapel Hill (United States); Rajan Jain, New York Univ. (United States); Tong Zhu, Washington Univ. in St. Louis (United States); Hemant Parmar, James M. Balter, Yue Cao, Univ. of Michigan (United States); Eli Gibson, Dorin Comaniciu, Siemens Healthineers (United States)

Lunch Break 11:40 AM - 1:20 PM

WORKSHOP ON AI USING LARGE-SCALE DATA WAREHOUSES

21 February 2023 • 1:20 PM - 3:10 PM | Town & Country B
Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Ivana Išgum, Amsterdam UMC (Netherlands)
Workshop Chair: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Ivana Išgum, Amsterdam UMC (Netherlands)

Data warehouses are increasingly built by hospitals and medical institutions. They gather data on a very large scale and contain of wide range of data types and acquisition protocols. For these reasons, data warehouses offer fantastic opportunities to build artificial intelligence (AI) tools which are efficient, robust and generalize well to realistic clinical scenarii. However, building such data warehouses and using them for AI medical imaging research also pose considerable challenges. This workshop will present different initiatives involving building and using data warehouses, discuss the associated challenges, the proposed solutions and the remaining open questions.

12464-700 • 1:20 PM - 1:25 PM | Town & Country B
Chair welcome and introduction

12464-701 • 1:25 PM - 1:50 PM | Town & Country B
Radiology data warehouses: data preparation and dissemination
Author(s): Ronald M. Summers, National Institutes of Health Clinical Ctr. (United States)

12464-702 • 1:50 PM - 2:15 PM | Town & Country B

Design and implementation of a real-time research data warehouse: lessons learned from Vanderbilt's ImageVU

Author(s): Bennett A. Landman, Vanderbilt Univ. (United States)

12464-703 • 2:15 PM - 2:40 PM | Town & Country B
Exploiting hospital data warehouses: the challenges of image quality and heterogeneity

Author(s): Ninon Burgos, Institut du Cerveau et de la Moelle Épinière (France)

12464-704 • 2:15 PM - 2:40 PM | Town & Country B
Panel Discussion

Coffee Break 3:10 PM - 3:30 PM

SESSION 5: BRAIN APPLICATIONS

21 February 2023 • 3:30 PM - 5:30 PM | Town & Country B
Session Chairs: Ulas Bagci, Northwestern Univ. (United States), Jayaram K. Udupa, Univ. of Pennsylvania (United States)

12464-20 • 3:30 PM - 3:50 PM | Town & Country B
FastCod: fast brain connectivity in diffusion imaging

Author(s): Zhangxing Bian, Muhan Shao, Johns Hopkins Univ. (United States); Jiachen Zhuo, Rao P. Gullapalli, Univ. of Maryland School of Medicine (United States); Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (United States)

12464-21 • 3:50 PM - 4:10 PM | Town & Country B
SSL2: self-supervised learning meets semi-supervised learning: Multiple Sclerosis segmentation in 7T-MRI from large-scale 3T-MRI

Author(s): Jiacheng Wang, Hao Li, Han Liu, Dewei Hu, Daiwei Lu, Vanderbilt Univ. (United States); Keejin Yoon, Kelsey Barter, Francesca Bagnato, Vanderbilt Univ. Medical Ctr. (United States); Ipek Oguz, Vanderbilt Univ. (United States)

12464-22 • 4:10 PM - 4:30 PM | Town & Country B
Interpretable automatic detection of incomplete hippocampal inversions using anatomical criteria

Author(s): Lisa Hemforth, Institut du Cerveau et de la Moelle Épinière (France); Claire Cury, Univ. de Rennes 1 (France); Vincent Frouin, NeuroSpin (France); Sylvane Desrivières, King's College London (United Kingdom); Antoine Grigis, NeuroSpin (France); Hugh Garavan, The Univ. of Vermont (United States); Rüdiger Brühl, Physikalisch-Technische Bundesanstalt (Germany); Jean-Luc Martinot, Marie-Laure Paillère Martinot, Eric Artiges, Univ. Paris-Saclay (France); Luise Poustka, Universitätsmedizin Göttingen (Germany); Sarah Hohmann, Sabina Millenet, Universitätsmedizin Mannheim (Germany); Nilakshi Vaidya, Ctr. for Population Neuroscience and Stratified Medicine (Germany); Henrik Walter, Charité Universitätsmedizin Berlin (Germany); Robert Whelan, Trinity College Dublin (Ireland); Gunter Schumann, Institute for Science and Technology of Brain-Inspired Intelligence (China); Baptiste Couvy-Duchesne, Olivier Colliot, Institut du Cerveau et de la Moelle Épinière (France)

12464-23 • 4:30 PM - 4:50 PM | Town & Country B
An attentional unet with an auxiliary class learning to support acute ischemic stroke segmentation on CT

Author(s): Santiago Gómez, Sebastian Florez, Univ. Industrial de Santander (Colombia); Daniel Mantilla, Paul Camacho, Nick Tarazona, Clínica FOSCAL (Colombia); Fabio Martínez, Univ. Industrial de Santander (Colombia)

12464-24 • 4:50 PM - 5:10 PM | Town & Country B
Automatic brain pose estimation in fetal MRI

Author(s): Razieh Faghihpirayesh, Northeastern Univ. (United States); Davood Karimi, Boston Children's Hospital (United States), Harvard Medical School (United States); Deniz Erdogmus, Northeastern Univ. (United States); Ali Gholipour, Boston Children's Hospital (United States), Harvard Medical School (United States)

12464-25 • 5:10 PM - 5:30 PM | Town & Country B
Automatic preprocessing pipeline for white matter functional analyses of large-scale databases

Author(s): Yurui Gao, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. (United States); Dylan R. Lawless, Vanderbilt Univ. (United States), Vanderbilt Univ. Institute of Imaging Science (United States); Muwei Li, Yu Zhao, Kurt G. Schilling, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. Medical Ctr. (United States); Lyuan Xu, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. (United States); Andrea T. Shafer, Lab. of Behavioral Neuroscience (United States); Lori L. Beason-Held, Susan M. Resnick, Lab. of Behavioral Neuroscience, National Institute on Aging (United States), National Institutes of Health (United States); Baxter P. Rogers, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. Medical Ctr. (United States); Zhaohua Ding, Adam W. Anderson, Bennett A. Landman, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. (United States); John C. Gore, Vanderbilt Univ. Institute of Imaging Science (United States), Vanderbilt Univ. (United States), Vanderbilt Univ. Medical Ctr. (United States)

Deep Learning in Medical Image Formation: Current Status and Future Directions
21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A
Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A
Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

CONFERENCE 12464

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A
Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: Welcome and Introduction

8:05 AM: Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 6: IMAGE QUALITY, HARMONIZATION, AND QUANTITATIVE ANALYSIS

22 February 2023 • 10:30 AM - 11:50 AM | Town & Country B
Session Chairs: Hayit Greenspan, Tel Aviv Univ. (Israel), Ninon Burgos, Institut du Cerveau et de la Moelle Épinière (France)

12464-26 • 10:30 AM - 10:50 AM | Town & Country B
Scalable NMF via linearly optimized data compression
Author(s): Sung Min Ha, Abdalla Bani, Aristeidis Sotiras, Washington Univ. in St. Louis (United States)

12464-27 • 10:50 AM - 11:10 AM | Town & Country B
Deep constrained spherical deconvolution for robust harmonization
Author(s): Tianyuan Yao, Vanderbilt Univ. (United States); Francois Rheault, Univ. of Sherbrooke (Canada); Leon Y. Cai, Vanderbilt Univ. School of Medicine (United States); Vishwesh Nath, NVIDIA Corp. (United States); Zuhayr Asad, Nancy Newlin, Can Cui, Ruining Deng, Karthik Ramadass, Kurt G. Schilling, Bennett A. Landman, Yuankai Huo, Vanderbilt Univ. (United States)

12464-28 • 11:10 AM - 11:30 AM | Town & Country B
Harmonization of repetition time and scanner effects on estimates of brain hemodynamic response function
Author(s): Lucie Dole, Kurt G. Schilling, Hakmook Kang, John C. Gore, Bennett A. Landman, Vanderbilt Univ. (United States)

12464-29 • 11:30 AM - 11:50 AM | Town & Country B
Novel application of the attention mechanism on medical image harmonization
Author(s): Xing Yao, Ange Lou, Hao Li, Dewei Hu, Daiwei Lu, Han Liu, Jiacheng Wang, Zachary A. Stoebner, Vanderbilt Univ. (United States); Hans Johnson, Jeff D. Long, The Univ. of Iowa (United States); Jane Paulsen, Univ. of Wisconsin-Madison (United States); Ipek Oguz, Vanderbilt Univ. (United States)

Lunch Break 11:50 AM - 1:30 PM

SESSION 7: DEEP-DIVE SESSION

22 February 2023 • 1:30 PM - 3:00 PM | Town & Country B
Session Chairs: Bennett A. Landman, Vanderbilt Univ. (United States), James C. Gee, Univ. of Pennsylvania (United States)

12464-30 • 1:30 PM - 2:00 PM | Town & Country B
Domain generalization for robust MS lesion segmentation
Author(s): Huahong Zhang, Hao Li, Kathleen Larson, Kilian Hett, Ipek Oguz, Vanderbilt Univ. (United States)

12464-31 • 2:00 PM - 2:30 PM | Town & Country B
Synthesizing audio from tongue motion during speech using tagged MRI via transformer
Author(s): Xiaofeng Liu, Fangxu Xing, Massachusetts General Hospital (United States), Harvard Univ. (United States); Jerry L. Prince, Johns Hopkins Univ. (United States); Maureen Stone, Univ. of Maryland, Baltimore (United States); Georges El Fakhri, Jonghye Woo, Massachusetts General Hospital (United States), Harvard Univ. (United States)

12464-32 • 2:30 PM - 3:00 PM | Town & Country B
Learning disentangled representations for explainable chest x-ray classification using Dirichlet VAEs
Author(s): Rachael Harkness, Alejandro F. Frangi, Kieran Zucker, Nishant Ravikumar, Univ. of Leeds (United Kingdom)

Coffee Break 3:00 PM - 3:30 PM

SESSION 8: TRANSFORMERS

22 February 2023 • 3:30 PM - 5:10 PM | Town & Country B
Session Chairs: Jhimli Mitra, GE Research (United States), Jonghye Woo, Massachusetts General Hospital (United States)

12464-33 • 3:30 PM - 3:50 PM | Town & Country B
Time-distance vision transformers in lung cancer diagnosis from longitudinal computed tomography
Author(s): Thomas Z. Li, Kaiwen Xu, Riqiang Gao, Yucheng Tang, Thomas A. Lasko, Fabien Maldonado, Kim L. Sandler, Bennett A. Landman, Vanderbilt Univ. (United States)

12464-34 • 3:50 PM - 4:10 PM | Town & Country B
Direct head-to-head comparison of convolutional long short-term memory and transformer networks for artificial Intelligence-based quantification of atherosclerotic plaque and stenosis from coronary CT angiography
Author(s): Nipun Manral, Andrew Lin, Caroline Park, Priscilla McElhinney, Aditya Killekar, Cedars-Sinai Medical Ctr. (United States); Matsumoto Hidenari, Showa Univ. School of Medicine (Japan); Jacek Kwiecinski, BHF Ctr. for Cardiovascular Science, The Univ. of Edinburgh (United Kingdom); Aryabod Razipour, Kajetan Grodecki, Cedars-Sinai Medical Ctr. (United States); Mhairi Doris, BHF Ctr. for Cardiovascular Science, The Univ. of Edinburgh (United Kingdom); Alan C. Kwan, Donghee Han, Keiichiro Kuronuma, Guadalupe Flores Tomasino, Evangelos Tzolos, Aakash Dhananjay Shanbhag, Cedars-Sinai Medical Ctr. (United States); Markus Goeller, Mohamed Marwan, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Sebastien Cadet, Cedars-Sinai Medical Ctr. (United States); Stephen Achenbach, Friedrich-Alexander-Univ. Erlangen-Nürnberg (Germany); Stephen J. Nicholls, Dennis T. Wong, Monash Cardiovascular Research Ctr., Victorian Heart Institute, Monash Univ. (Australia); Daniel S. Berman, Cedars-Sinai Medical Ctr. (United States); Marc Dweck, David E. Newby, Michelle C. Williams, BHF Ctr. for Cardiovascular Science, The Univ. of Edinburgh (United Kingdom); Piotr J. Slomka, Damini Dey, Cedars-Sinai Medical Ctr. (United States)

12464-35 • 4:10 PM - 4:30 PM | Town & Country
Uncertainty-aware transformer model for anatomical landmark detection in paraspinal muscle MRIs
Author(s): Soorena Salari, Amirhossein Rasoulian, Concordia Univ. (Canada); Michele Battie, Western Univ. (Canada); Maryse Fortin, Hassan Rivaz, Yiming Xiao, Concordia Univ. (Canada), PERFORM Ctr. (Canada)

12464-36 • 4:30 PM - 4:50 PM | Town & Country B
L-former: a lightweight transformer for realistic medical image generation and its application to super-resolution
Author(s): Tong Zheng, Nagoya Univ. (Japan); Hirohisa Oda, Univ. of Shizuoka (Japan); Yuichiro Hayashi, Shota Nakamura, Nagoya Univ. (Japan); Masaki Mori, Sapporo Kosei Hospital (Japan); Hirotsugu Takabatake, Minami Sanjyo Hospital (Japan); Hiroshi Natori, Nishioka Hospital (Japan); Masahiro Oda, Kensaku Mori, Nagoya Univ. (Japan)

12464-37 • 4:50 PM - 5:10 PM | Town & Country B
Convolutions, transformers, and their ensembles for the segmentation of organs at risk in radiation treatment of cervical cancer
Author(s): Evangelos Kostoulas, Leiden Univ. Medical Ctr. (Netherlands); Peter Bosman, Ctr. Wiskunde & Informatica (Netherlands); Tanja Alderliesten, Leiden Univ. Medical Ctr. (Netherlands)

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A
Seeing and feeling in robot-assisted surgery
(Keynote Presentation)
Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A
Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)
Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 9: IMAGE RECONSTRUCTION, CORRECTION, AND QUALITY

23 February 2023 • 10:30 AM - 11:50 AM | Town & Country B
Session Chairs: Jayaram K. Udupa, Univ. of Pennsylvania (United States), Joshua Victor Stough, Bucknell Univ. (United States)

12464-38 • 10:30 AM - 10:50 AM | Town & Country B
SynBOLD-DisCo: synthetic BOLD images for distortion correction of fMRI without additional calibration scans
Author(s): Tian Yu, Leon Y. Cai, Victoria L. Morgan, Sarah E. Goodale, Dario J. Englot, Catherine E. Chang, Bennett A. Landman, Kurt G. Schilling, Vanderbilt Univ. (United States)

12464-39 • 10:50 AM - 11:10 AM | Town & Country B
A latent space for unsupervised MR image quality control via artifact assessment
Author(s): Lianrui Zuo, Johns Hopkins Univ. (United States), National Institutes of Health (United States); Yuan Xue, Johns Hopkins Univ. (United States); Blake E. Dewey, The Johns Hopkins Univ. School of Medicine (United States); Yihao Liu, Jerry L. Prince, Aaron Carass, Johns Hopkins Univ. (United States)

12464-40 • 11:10 AM - 11:30 AM | Town & Country B**Supervised transform learning for limited angle tomographic reconstruction**
Author(s): Zhipeng Li, Gaoyu Chen, Shanghai Jiao Tong Univ. (China); Hao Gao, The Univ. of Kansas Medical Ctr. (United States); Yong Long, Shanghai Jiao Tong Univ. (China)

12464-41 • 11:30 AM - 11:50 AM | Town & Country B
DrDisco: Deep Registration for Distortion Correction of diffusion MRI with single phase-encoding
Author(s): Zhangxing Bian, Muhan Shao, Aaron Carass, Jerry L. Prince, Johns Hopkins Univ. (United States)

Lunch Break 11:50 AM - 1:20 PM

CONFERENCE 12464

23 February 2023 • 1:20 PM - 2:40 PM | Town & Country B
Session Chairs: Benoit M. Dawant, Vanderbilt Univ. (United States), Letícia Rittner, Univ. of Campinas (Brazil)

12464-42 • 1:20 PM - 1:40 PM | Town & Country B
Co-Unet-GAN: a co-learning domain adaptation model on echocardiography segmentation
Author(s): Junyang Cai, Bucknell Univ. (United States); Christopher M. Haggerty, Geisinger Health (United States); Joshua V. Stough, Bucknell Univ. (United States)

12464-43 • 1:40 PM - 2:00 PM | Town & Country B
Peripapillary atrophy segmentation in fundus images via multi-tasks learning
Author(s): Xiao Wei, Bo Jiang, Yuye Ling, Shanghai Jiao Tong Univ. (China); Peiyao Jin, Shanghai General Hospital (China), Shanghai Jiao Tong Univ. (China); Yifan Wang, Xinbing Wang, Shanghai Jiao Tong Univ. (China); Chenghu Zhou, Chinese Academy of Sciences (China); Yu Gan, Stevens Institute of Technology (United States)

12464-45 • 2:00 PM - 2:20 PM | Town & Country B
Cascaded neural network segmentation pipeline for automated delineation of prostate and organs at risk in male pelvic CT
Author(s): Rahul Pemmaraju, Daniel Y. Song, Junghoon Lee, Johns Hopkins Univ. (United States)

12464-46 • 2:20 PM - 2:40 PM | Town & Country B
Estimation of incomplete organ-coverage using 3D fully convolutional networks
Author(s): Hrishikesh Deshpande, Axel Saalbach, Tim Harder, Philips Research (Germany); Edna Coetser, Philips Healthcare (Netherlands); Shlomo Gotman, Philips Healthcare (Israel); Thomas Buelow, Philips Research (Germany); Christian Wülker, Philips GmbH Innovative Technologies (Germany)

19 February 2023 • 8:00 AM - 8:00 AM | On Demand
The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12464-4
Deep curriculum learning for follow-up MRI registration in glioblastoma
Author(s): Subhashis Banerjee, Dimitrios Toumpanakis, Uppsala Univ. (Sweden); Ashis K. Dhara, National Institute of Technology, Durgapur (India); Johan Wikström, Robin Strand, Uppsala Univ. (Sweden)

12464-7
Lifelong learning with dynamic convolutions for glioma segmentation from multi-modal MRI
Author(s): Subhashis Banerjee, Robin Strand, Uppsala Univ. (Sweden)

12464-13
Fully-automatic aortic valve landmarks detection with two-stage-based convolutional neural networks
Author(s): Qixiang Ma, Léo Lemarchand, Univ. de Rennes 1 (France); Diane Chan-Sock-Line, Univ Rennes, CHU Rennes, Inserm, LTSI – UMR 1099 (France); Louis Rigal, Antoine Simon, Pascal Haigron, Univ. de Rennes 1 (France)

12464-16
Multi-modality network based on CGAN and attention mechanism for glaucoma grading
Author(s): Ling Liu, Yuanyuan Peng, Dehui Xiang, Fei Shi, Xinjian Chen, Soochow Univ. (China)

12464-50
A two-stage unsupervised domain adaptation method for OCT image segmentation
Author(s): Shengyong Diao, Xinjian Chen, Dehui Xiang, Weifang Zhu, Soochow Univ. (China); Yin Fan, Shanghai Jiao Tong Univ. (China); Fei Shi, Soochow Univ. (China)

12464-51
Pancreatic CT image segmentation based on transfer learning
Author(s): Xiaoyi Zhu, Dehui Xiang, Fei Shi, Weifang Zhu, Xinjian Chen, Soochow Univ. (China)

12464-62
An FPGA-based edge computing and accelerating platform for fast diabetic retinopathy diagnosis
Author(s): Silong Li, Southern Univ. of Science and Technology of China (China); Jiaming Qiu, Harbin Institute of Technology (China); Yijin Huang, Xiaoying Tang, Tao Ye, Southern Univ. of Science and Technology of China (China)

12464-64
Multi-source bioluminescene tomography reconstruction approach base on subspace decision
Author(s): Xiao Wei, Hongbo Guo, Xuelei He, Northwest Univ. (China); Jingjing Yu, Shaanxi Normal Univ. (China); Xiaowei He, Northwest Univ. (China)

12464-68
Cardiac dynamics compensation for intravascular ultrasound sequences
Author(s): Runing Xiao, Wei Yu, Shengxian Tu, Shanghai Jiao Tong Univ. (China)

12464-69
Meta-learning-based retinal pathology classification from optical coherence tomography images
Author(s): Ziting Yin, Xinjian Chen, Weifang Zhu, Dehui Xiang, Soochow Univ. (China); Qing Peng, Shanghai Tenth People's Hospital (China); Fei Shi, Soochow Univ. (China)

12464-78
Multi-target reconstruction of fluorescence molecular tomography based on blind source separation
Author(s): Lizhi Zhang, Beilei Wang, Xiaowei He, Shuangchen Li, Xiao Wei, Zijian Tang, Hongbo Guo, Northwest Univ. (China)

12464-82
A comparison of U-Net series for CT pancreas segmentation
Author(s): Linya Zheng, Ji Li, Fan Zhang, Xiamen Univ. (China); Hong Shi, Fujian Medical Univ. Cancer Hospital (China); Yinran Chen, Xiongbiao Luo, Xiamen Univ. (China)

12464-84
Segmentation of common lesions in age-related macular degeneration based on boundary attention mechanism
Author(s): Chengjian Hong, Yuanyuan Peng, Weifang Zhu, Dehui Xiang, Fei Shi, Baoqing Nie, Xinjian Chen, Soochow Univ. (China)

12464-91

Learning to atlas register for rapid segmentation of brain structures in fetal MRI

Author(s): Tanvi Kulkarni, Aqil K. H., Indian Institute of Technology Madras (India); Jaikishan Jayakumar, Ctr. for Computational Brain Research (India), Indian Institute of Technology Madras (India); Keerthi Ram, Healthcare Technology and Innovation Ctr. (India), Indian Institute of Technology Madras (India); Mohanasankar Sivaprakasam, Indian Institute of Technology Madras (India), Healthcare Technology and Innovation Ctr. (India)

12464-101

Based on model-driven fast iterative shrinkage thresholding network for bioluminescence tomography reconstruction

Author(s): Heng Zhang, Xiaowei He, Hongbo Guo, Yanqiu Liu, Shuangchen Li, Yizhe Zhao, Xuelei He, Northwest Univ. (China); Jingjing Yu, Shaanxi Normal Univ. (China); Yuqing Hou, Northwest Univ. (China)

12464-110

IF-Net: information fusion network for meibomian gland area and atrophy area segmentation

Author(s): Dengfeng Liu, Weifang Zhu, Soochow Univ. (China); Xinyu Zhuang, The First Affiliated Hospital of Soochow Univ. (China); Xiaofeng Zhang, Dushu Lake Hospital Affiliated to Soochow Univ. (China); Xinjian Chen, Fei Shi, Dehui Xiang, Soochow Univ. (China)

12464-116

Pulmonary CT nodules segmentation using an enhanced square U-Net with depthwise separable convolution

Author(s): Ji Li, Jiabao Jin, Dongfang Shen, Guanping Xu, Xiamen Univ. (China); Hui-Qing Zeng, Sunkui Ke, Xiangxing Chen, Zhongshan Hospital, Xiamen Univ. (China); Miao Wang, Xiongbiao Luo, Xiamen Univ. (China)

12464-119

Single-view cone beam CT reconstruction with swin transformer based deep learning

Author(s): Shien Huang, Xi'an Jiaotong Univ. (China); Yonghong Song, School of Software Engineering, Xi'an Jiaotong University (China); Junyan Rong, Fourth Military Medical Univ. (China); Tianshuai Liu, Dong Huang, Hongbing Lu, PLA Air Force Military Medical Univ. (China)

Conference 12465

Computer-Aided Diagnosis

19 - 23 February 2023 | Town & Country C

Conference Chairs: **Khan M. Iftekharuddin,** Old Dominion Univ. (United States); **Weijie Chen,** U.S. Food and Drug Administration (United States)

Program Committee: **Sameer K. Antani,** U.S. National Library of Medicine (United States): **Samuel G. Armato,** The Univ. of Chicago (United States): **Susan M. Astley,** The Univ. of Manchester (United Kingdom): **Ulas Bagci,** Northwestern Univ. (United States): **Esther E. Bron,** Erasmus MC (Netherlands): **Matthew S. Brown,** UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States): **Kenny H. Cha,** U.S. Food and Drug Administration (United States): **Heang-Ping Chan,** Univ. of Michigan (United States): **Thomas M. Deserno,** Technische Univ. Braunschweig (Germany): **Karen Drukker,** The Univ. of Chicago (United States): **Jan Ehrhardt,** Univ. zu Lübeck (Germany): **Catalin Fetita,** Télécom SudParis (France): **Aimilia Gastounioti,** Penn Medicine (United States): **Maryellen L. Giger,** The Univ. of Chicago (United States): **Hayit Greenspan,** Tel Aviv Univ. (Israel): **Lubomir M. Hadjiiski,** Univ. of Michigan (United States): **Horst K. Hahn,** Fraunhofer MEVIS (Germany): **Takeshi Hara,** Gifu Univ. School of Medicine (Japan): **Helen Hong,** Seoul Women's Univ. (Korea, Republic of): **JongHyo Kim,** Seoul National Univ. Hospital (Korea, Republic of): **Despina Kontos,** Penn Medicine (United States): **Juhun Lee,** Univ. of Pittsburgh (United States): **Zhengrong Jerome Liang,** Stony Brook Univ. (United States): **Marius George Linguraru,** Children's National Medical Ctr. (United States): **Hongbing Lu,** PLA Air Force Military Medical Univ. (China): **Maciej A. Mazurowski,** Duke Univ. (United States): **Fabrice Meriaudeau,** Univ. de Bourgogne (France): **Kensaku Mori,** Nagoya Univ. (Japan): **Chisako Muramatsu,** Shiga Univ. (Japan): **Janne J. Näppi,** Massachusetts General Hospital (United States): **Carol L. Novak,** Siemens Healthineers (United States): **Nicholas A. Petrick,** U.S. Food and Drug Administration (United States): **Antonio R. Porras,** Children's National Health System (United States): **Prateek Prasanna,** Stony Brook Univ. (United States): **Letícia Rittner,** Univ. of Campinas (Brazil): **Ravi K. Samala,** U.S. Food and Drug Administration (United States): **Clarisa I. Sánchez-Gutiérrez,** Univ. of Amsterdam (Netherlands): **Ronald M. Summers,** National Institutes of Health Clinical Ctr. (United States): **Kenji Suzuki,** Tokyo Institute of Technology (Japan); **Jonas Teuwen,** Netherlands Cancer Institute (Netherlands); **Pallavi Tiwari,** Univ. of Wisconsin-Madison (United States); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (United States); **Shandong Wu,** Univ. of Pittsburgh (United States); **Xiaofeng Yang,** Emory Univ. School of Medicine (United States); **Hiroyuki Yoshida,** Massachusetts General Hospital (United States); **Chuan Zhou,** Michigan Medicine (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: **Symposium Chair Welcome and Best Student Paper Award Announcement**

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

SPIE.

5:40 pm: **New SPIE Fellows Acknowledgments**

5:45 pm: **SPIE Harrison H. Barrett Award in Medical Imaging**
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments
(Plenary Presentation)

Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement**

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: NEUROLOGY

20 February 2023 • 10:30 AM - 11:50 AM | Town & Country C
Session Chairs: Axel Wismüller, Univ. of Rochester Medical Ctr. (United States), Zhengrong Liang, Stony Brook Univ. (United States)

12465-1 • 10:30 AM - 10:50 AM | Town & Country C
Normative modeling using multimodal variational autoencoders to identify abnormal brain volume deviations in Alzheimer disease
Author(s): Sayantan Kumar, Philip R. O. Payne, Aristeidis Sotiras, Washington Univ. in St. Louis (United States)

12465-2 • 10:50 AM - 11:10 AM | Town & Country C
Unsupervised learning of healthy anatomy for anomaly detection in brain CT scans
Author(s): Sina Walluscheck, Luca Canalini, Jan Klein, Stefan Heldmann, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

12465-3 • 11:10 AM - 11:30 AM | Town & Country C
From adult to pediatric: deep learning-based automatic segmentation of rare pediatric brain tumors
Author(s): Xinyang Liu, Children's National Hospital (United States); Erin R. Bonner, Children's National Hospital (United States), The George Washington Univ. (United States); Zhifan Jiang, Children's National Hospital (United States); Holger Roth, NVIDIA Corp. (United States); Roger Packer, Miriam Bornhorst, Marius G. Linguraru, Children's National Hospital (United States)

12465-4 • 11:30 AM - 11:50 AM | Town & Country C
Bi-modal network combining convolutional neural network and TabNet, differentiating spinal tumors based on images and clinical risk factors
Author(s): Kosuke Kita, Takahito Fujimori, Yuki Suzuki, Seiji Okada, Shoji Kido, Osaka Univ. (Japan)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: RADIOMICS, RADIOGENOMICS, AND MULTI-OMICS

20 February 2023 • 1:20 PM - 3:00 PM | Town & Country C
Session Chairs: Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany), Shandong Wu, Univ. of Pittsburgh (United States)

12465-5 • 1:20 PM - 1:40 PM | Town & Country C
Novel integration of radiomics and deep transfer learning for diagnosis of indeterminant thyroid nodules on ultrasound
Author(s): Joseph L. Cozzi, Hui Li, Julian Conn Busch, Jelani Williams, Li Lan, Xavier Keutgen, Maryellen L. Giger, The Univ. of Chicago (United States)

12465-6 • 1:40 PM - 2:00 PM | Town & Country C
MultiComBat: ComBat harmonization of multiple batch variables
Author(s): Hannah Horng, Despina Kontos, Russell T. Shinohara, Univ. of Pennsylvania (United States)

12465-7 • 2:00 PM - 2:20 PM | Town & Country C
Prediction of recurrence in non-small cell lung cancer (NSCLC) using Gabor and radiomic-feature based models applied to CT image data
Author(s): Alexandra C. Shiffer, Grace Hyun Kim, Michael McNitt-Gray, UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States)

12465-8 • 2:20 PM - 2:40 PM | Town & Country C
Classification of schizophrenia using large-scale kernelized Granger causality (lsKGC) and functional MR imaging
Author(s): Ali Vosoughi, Akhil Kasturi, Nathan Hadjiyski, Univ. of Rochester (United States); Axel Wismüller, Univ. of Rochester Medical Ctr. (United States)

12465-9 • 2:40 PM - 3:00 PM | Town & Country C
Anterior cruciate ligament classification in knee MRI using automated pseudo-masking
Author(s): Saba Dadsetan, Marcio Albers, Allison Weinstock, Volker Musahl, Gene Kitamura, Dooman Arefan, Shandong Wu, Univ. of Pittsburgh (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: COVID-19

20 February 2023 • 3:30 PM - 5:30 PM | Town & Country C
Session Chairs: Samuel G. Armato, The Univ. of Chicago (United States), Hiroyuki Yoshida, Massachusetts General Hospital (United States)

12465-10 • 3:30 PM - 3:50 PM | Town & Country C
A radiomics-based model for the outcome prediction in COVID-19 positive patients through deep learning with both longitudinal chest x-ray and chest computed tomography images
Author(s): Chunrui Zou, Walter Mankowski, Lauren Pantalone, Shefali Setia Verma, Eduardo J. Mortani Barbosa, Tessa S. Cook, Peter B. Noel, Erica L. Carpenter, Jeffrey C. Thompson, Russell T. Shinohara, Sharyn I. Katz, Despina Kontos, Univ. of Pennsylvania (United States)

12465-11 • 3:50 PM - 4:10 PM | Town & Country C
Improved method for COVID-19 classification of complex-architecture CNN from chest CT volumes using orthogonal ensemble networks
Author(s): Ryo Toda, Masahiro Oda, Yuichiro Hayashi, Nagoya Univ. (Japan); Yoshito Otake, Nara Institute of Science and Technology (Japan); Masahiro Hashimoto, Keio Univ. School of Medicine (Japan); Toshiaki Akashi, Shigeki Aoki, Juntendo Univ. (Japan); Kensaku Mori, Nagoya Univ. (Japan)

12465-12 • 4:10 PM - 4:30 PM | Town & Country C
Linking CT and SPECT based analysis for quantitative follow-up of vascular perfusion defects in COVID-19
Author(s): Catalin Fetita, Antoine Didier, Télécom SudParis (France); Jean Richeux, Ctr. Hospitalier Univ. de Caen Normandie (France); Christian Tulvan, Télécom SudParis (France); Jean-François Bernaudin, Pierre-Yves Brillet, Avicenne Hospital (France); Aurelien Justet, Ctr. Hospitalier Univ. de Caen Normandie (France)

12465-13 • 4:30 PM - 4:50 PM | Town & Country C
Assessing robustness of a deep-learning model for COVID-19 classification on chest radiographs
Author(s): Mena Shenouda, The Univ. of Chicago (United States); Aditi Kaveti, Stony Brook Univ. (United States); Isabella Flerlage, Vanderbilt Univ. (United States); Jayashree Kalpathy-Cramer, Harvard Medical School (United States); Maryellen L. Giger, Samuel G. Armato, The Univ. of Chicago (United States)

Conference 12465

12465-14 • 4:50 PM - 5:10 PM | Town & Country C

Bayesian neural networks for severity assessment of COVID-19 pneumonia from chest x-ray using a multi-reader and binational dataset

Author(s): Mohammadreza Zandehshahvar, Georgia Institute of Technology (United States); Marly van Assen, Eun Young Kim, Emory Univ. (United States); Yashar Kiarashi, Vikranth Keerthipati, Georgia Institute of Technology (United States); Arthur E. Stillman, Peter Filev, Amir H. Davarpanah, Eugene A. Berkowitz, Stefan Tigges, Scott J. Lee, Brianna L. Vey, Carlo De Cecco, Emory Univ. (United States); Ali Adibi, Georgia Institute of Technology (United States)

12465-15 • 5:10 PM - 5:30 PM | Town & Country C

Federated learning using multi-institutional data for generalizable chest x-ray diagnosis

Author(s): Keshava Chowdari Dabbara, Radhasyam Nunna, Indian Institute of Technology Jodhpur (India); Anabik Pal, SRM Univ., AP - Amaravati (India); Angshuman Paul, Indian Institute of Technology Jodhpur (India)

POSTERS-MONDAY

20 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period: 5:00 PM Sunday – 5:00 PM Monday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Monday. Judging may begin after this time. Posters must remain on display until the end of the Monday evening poster session, but may be left hanging until 1:00 PM Tuesday.

12:00 PM to 5:00 PM: Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Monday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Tuesday for extended viewing. All Posters must be removed by 1:00 PM on Tuesday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12465-58

Real-time Barrett's neoplasia characterization in NBI videos using an int8-based quantized neural network

Author(s): Carolus H. Kusters, Tim G. W. Boers, Technische Univ. Eindhoven (Netherlands); Jelmer B. Jukema, Martijn R. Jong, Kiki N. Fockens, Albert J. de Groof, Jacques J. Bergman, Amsterdam UMC (Netherlands); Fons van der Sommen, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands)

12465-59

Automatic characterization of liver tumors from multi-phase CT images

Author(s): Keita Otani, FUJIFILM Corp. (Japan); Daiki Nishigaki, Osaka Univ. (Japan); Taro Hatsutani, FUJIFILM Corp. (Japan); Takeshi Takamoto, National Cancer Ctr. Hospital (Japan); Yuki Suzuki, Shoji Kido, Noriyuki Tomiyama, Osaka Univ. (Japan)

12465-60

Abdominal CT pancreas segmentation using multi-scale convolution with aggregated transformations

Author(s): Jin Yang, Daniel S. Marcus, Aristeidis Sotiras, Washington Univ. in St. Louis (United States)

12465-61

Improving small lesion segmentation in CT scans using intensity distribution supervision: application to small bowel carcinoid tumor

Author(s): Seung Yeon Shin, Thomas C. Shen, National Institutes of Health Clinical Ctr. (United States); Stephen A. Wank, National Institutes of Health (United States); Ronald M. Summers, National Institutes of Health Clinical Ctr. (United States)

12465-62

Catheter segmentation in chest x-ray: improving imbalanced segmentation with a class frequency weighted loss function

Author(s): Siyuan Wei, Youngwon Choi, Muhammad Wahi-Anwar, Liza Shrestha, Koon-Pong Wong, Matthew S. Brown, UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States)

12465-63

Machine reasoning for segmentation of the kidneys on CT images: improving CNN performance by incorporating anatomical knowledge in post-processing

Author(s): Gabriel Melendez-Corres, Youngwon Choi, Muhammad Wahi-Anwar, Heidi Coy, Steve S. Raman, Matthew S. Brown, UCLA Ctr. for Computer Vision & Imaging Biomarkers (United States)

12465-64

Deep learning with visual explanation for radiotherapy-induced toxicity prediction

Author(s): Behnaz Elhaminia, Alexandra Gilbert, Alex Frangi, Andrew Scarsbrook, John Lilley, Ane Allept, Univ. of Leeds (United Kingdom); Ali Gooya, Univ. of Glasgow (United Kingdom)

12465-65

Deep learning-based lung segmentation and automatic regional template in chest x-ray images for pediatric tuberculosis

Author(s): Daniel Capellán-Martín, Juan José Gómez-Valverde, Univ. Politécnica de Madrid (Spain), Ctr. de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (Spain); Ramon Sánchez-Jacob, The George Washington Univ. (United States), Children's National Hospital (United States); David Bermejo-Peláez, Univ. Politécnica de Madrid (Spain), Ctr. de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (Spain); Lara García-Delgado, Univ. Politécnica de Madrid (Spain), Ctr. de Investigación Biomédica en Red en Bioingeniería (Spain); Elisa López-Varela, Univ. de Barcelona (Spain), Stellenbosch Univ. (South Africa); María Jesús Ledesma-Carbayo, Univ. Politécnica de Madrid (Spain), Ctr. de Investigación Biomédica en Red en Bioingeniería, Biomateriales y Nanomedicina (Spain)

12465-66

Improving segmentation of calcified and non-calcified plaques on CCTA-CPR scans via masking of the artery wall

Author(s): Antonio Tejero-de-Pablos, Research Ctr. for Advanced Science and Technology, The Univ. of Tokyo (Japan); Hiroaki Yamane, RIKEN Ctr. for Advanced Intelligence Project (Japan); Yusuke Kurose, Research Ctr. for Advanced Science and Technology, The Univ. of Tokyo (Japan); Junichi Iho, Youji Tokunaga, Makoto Horie, Keisuke Nishizawa, Yusaku Hayashi, Yasushi Koyama, Sakurabashi Watanabe Hospital (Japan); Tatsuya Harada, Research Ctr. for Advanced Science and Technology, The Univ. of Tokyo (Japan)

12465-67

A deep learning method for localizing the origin of ventricular tachycardia using 12-lead ECG

Author(s): Ao Ran, Chengjin Yu, Huafeng Liu, Zhejiang Univ. (China)

12465-68

Prediction of hematoma expansion using a random forest model with clinical data of patients with intracerebral hemorrhage

Author(s): Akihiro Taguchi, Canon Medical Systems Corp. (Japan); Samantha E. Seymour, Univ. at Buffalo (United States); Ciprian N. Ionita, Canon Stroke and Vascular Research Ctr. (United States); Kurt Schultz, Canon Medical Research USA, Inc. (United States); Ryo Shiroishi, Canon Medical Systems Corp. (Japan)

12465-69

An MRI-based radiomics signatures for overall survival prediction of gliomas patients

Author(s): Huan Le Viet, Minh Tran Nguyen Tuan, Quang Hien Kha, Nguyen Quoc Khanh Le, Taipei Medical Univ. (Taiwan)

12465-70

Open-source tool for model performance analysis for subpopulations

Author(s): Stijn Vandewiele, Jonas De Vylder, Bart Diricx, Edward Sandra, Tom Kimpe, Barco N.V. (Belgium)

12465-71

Explainable AI for COVID-19 prognosis from early chest x-ray and clinical data in the context of the COVID-CXR international hackathon

Author(s): Edoardo Coppola, Damiano Ferrari, Mattia Savardi, Alberto Signoroni, Univ. degli Studi di Brescia (Italy)

12465-72

Prostate gleason score prediction via MRI using capsule network

Author(s): Yuheng Li, Emory Univ. (United States); Jing Wang, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States); Mingzhe Hu, Emory Univ. (United States); Pretesh Patel, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States); Hui Mao, Emory Univ. (United States); Tian Liu, Xiaofeng Yang, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States)

12465-73

Tensor based multi-modality fusion for prediction of postoperative early recurrence of single hepatocellular carcinoma

Author(s): Tianyi Wang, Sun Yat-Sen Univ. (China); Mingkai Li, The Third Affiliated Hospital of Sun Yat-Sen Univ. (China); Zebin Chen, The First Affiliated Hospital of Sun Yat-Sen Univ. (China); Xi Chen, Haimei Chen, Bin Wu, Xiaoying Wu, The Third Affiliated Hospital of Sun Yat-Sen Univ. (China); Yue Li, Yao Lu, Sun Yat-Sen Univ. (China)

12465-74

Topological prediction models for relapse of stage I patients with non-small cell lung cancer prior to stereotactic ablative radiotherarpy

Author(s): Takumi Kodama, Hidetaka Arimura, Kyushu Univ. (Japan); Yuko Shirakawa, National Hospital Organization Kyushu Cancer Ctr. (Japan); Kenta Ninomiya, Sanford Burnham Prebys Medical Discovery Institute (United States); Tadamasa Yoshitake, Kyushu Univ. (Japan); Yoshiyuki Shioyama, Saga Heavy Ion Medical Accelerator in Tosu (Japan)

12465-76

Artificial intelligence for image-based breast cancer risk prediction using attention

Author(s): Stepan Romanov, Sacha Howell, Elaine Harkness, Megan Bydder, Gareth Evans, Steven Squires, Martin Fergie, Sue Astley, The Univ. of Manchester (United Kingdom)

12465-77

Barrett's lesion detection using a minimal integer-based neural network for embedded systems integration

Author(s): Tim G. W. Boers, Carolus H. Kusters, Technische Univ. Eindhoven (Netherlands); Kiki N. Fockens, Jelmer B. Jukema, Martijn R. Jong, Jeroen de Groof, Jacques Bergman, Amsterdam UMC (Netherlands); Fons van der Sommen, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands)

12465-78

Classification of Alzheimer's disease using transfer learning

Author(s): Amaan Kazi, Univ. of Pittsburgh (United States); Tianze Tang, Xi'an Jiaotong Univ. (China); Prahlad G. Menon, Univ. of Pittsburgh (United States)

12465-79

The importance of data domain on self-supervised learning for brain metastasis detection and segmentation

Author(s): Youngjin Yoo, Gengyan Zhao, Andreea E. Sandu, Thomas J. Re, Jyotipriya Das, Siemens Healthineers (United States); Hesheng Wang, New York Univ. (United States); Michelle Kim, Univ. of Michigan (United States); Colette Shen, Yueh Lee, The Univ. of North Carolina at Chapel Hill (United States); Douglas Kondziolka, New York Univ. (United States); Mohannad Ibrahim, Univ. of Michigan (United States); Jun Lian, The Univ. of North Carolina at Chapel Hill (United States); Rajan Jain, New York Univ. (United States); Tong Zhu, Washington Univ. in St. Louis (United States); Hemant Parmar, James M. Balter, Yue Cao, Univ. of Michigan (United States); Eli Gibson, Dorin Comaniciu, Siemens Healthineers (United States)

12465-81

Breast mass characterization using sparse approximations of patch-sampled deep features

Author(s): Chelsea E. Harris, Sokratis Makrogiannis, Delaware State Univ. (United States)

12465-82

An analysis of intensity harmonization techniques for Parkinson's multi-site MRI datasets

Author(s): Raissa Souza, Emma A. M. Stanley, Milton Camacho, Matthias Wilms, Nils D. Forkert, Univ. of Calgary (Canada)

12465-83

Radiomics analysis to diagnose tumor invasiveness of pulmonary sub-solid nodules from longitudinal pre-surgical CT scans

Author(s): Apurva Singh, Hannah Horng, Leonid Roshkovan, Sharyn I. Katz, Despina Kontos, Jeffrey C. Thompson, Univ. of Pennsylvania (United States)

12465-84

Multiplexed diffused optical imaging generative adversarial network (mDOI-GAN) for sub-surface 3D imaging of tissues

Author(s): Shanshan Cai, John Mai, Winn Hong, Scott Fraser, Francesco Cutrale, The Univ. of Southern California (United States)

12465-85

Iterative K-means clustering for disease subtype discovery

Author(s): Katherine Aubert, Colorado School of Mines (United States); Catherine Huber, Jacob D. Furst, Daniela Stan Raicu, Roselyne Tchoua, DePaul Univ. (United States)

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12465-86

Glaucoma classification using a morphological-convolutional neural network trained with extreme learning machine

Author(s): Martha Rebeca Canales-Fiscal, José Tamez-Peña, Tecnológico de Monterrey (Mexico)

12465-87

A deep learning algorithm for detecting lytic bone lesions of multiple myeloma on CT

Author(s): Shahriar Faghani, Francis Baffour, Pouria Rouzrokh, Mana Moassefi, Bardia Khosravi, Micheal D. Ringler, Bradley J. Erickson, Mayo Clinic (United States)

12465-88

Improving medical image segmentation and classification using a novel joint deep learning model

Author(s): Sanjana Mudduluru, Sai Kiran Maryada, The Univ. of Oklahoma (United States); William L. Booker, Babel Analytics (United States); Dean F. Hougen, Bin Zheng, The Univ. of Oklahoma (United States)

12465-89

Preoperative perdition of tumor recurrence in patients with non-muscle-Invasive bladder cancer: a multiparametric MRI-based deep approach

Author(s): Haolin Huang, PLA Air Force Military Medical Univ. (China); Yiping Huang, The First Affiliated Hospital of Sun Yat-Sen Univ. (China); Xing Tang, Xijing Hospital (China); Lijuan Wang, Yang Liu, Hongbing Lu, PLA Air Force Military Medical Univ. (China); Huanjun Wang, The First Affiliated Hospital of Sun Yat-Sen Univ. (China); Xiaopan Xu, PLA Air Force Military Medical Univ. (China)

12465-91

Developing a breast lesion simulator and remover in mammograms using Cycle-GAN: focusing on its impacts on a computer aided detection algorithm

Author(s): Juhun Lee, Robert Nishikawa, Univ. of Pittsburgh (United States)

12465-92

A new radiomics strategy integrating the deep and shallow features for preoperative assessment of lymph node metastasis in patient with bladder cancer

Author(s): Xiaopan Xu, Lijuan Wang, Haolin Huang, Zixiao Liu, PLA Air Force Military Medical Univ. (China); Yang Wang, Xijing Hospital (China); Yang Liu, Hongbing Lu, PLA Air Force Military Medical Univ. (China)

12465-93

NesT UNet: pure transformer segmentation network with an application for automatic cardiac myocardial infarction evaluation

Author(s): Mahmoud K. Abdelhamed, Fabrice Meriaudeau, Univ. de Bourgogne (France)

12465-94

Clinical segmentation for improved pancreatic ductal adenocarcinoma detection and segmentation

Author(s): Terese Hellström, Christiaan Viviers, Technische Univ. Eindhoven (Netherlands); Mark Ramaekers, Catharina Hospital (Netherlands); Nick Tasios, Philips (Netherlands); Joost Nederend, Misha Luyer, Catharina Hospital (Netherlands); Peter H. N. de With, Fons van der Sommen, Technische Univ. Eindhoven (Netherlands)

12465-96

A volumetric multi-head attention strategy for lung nodule classification in CT

Author(s): Alejandra Moreno, Univ. Industrial de Santander (Colombia); Andrea Rueda, Pontificia Univ. Javeriana Bogotá (Colombia); Fabio Martínez, Univ. Industrial de Santander (Colombia)

12465-97

Segmentation of mouse tibia on MRI using deep learning U-Net models

Author(s): Aman Kushwaha, Rami F. Mourad, Kevin Heist, Dariya Malyarenko, Heang-Ping Chan, Thomas L. Chenevert, Lubomir Hadjiiski, Univ. of Michigan (United States)

12465-98

Predicting obstructive sleep apnea severity from craniofacial images using ensemble machine learning models

Author(s): Ziyu Su, Sandhya Kumar, Thomas E. Tavolara, Metin N. Gurcan, Scott Segal, M. Khalid Khan Niazi, Wake Forest School of Medicine (United States)

12465-99

Demystifying shortcuts in deep learning models for chest x-ray classification

Author(s): Dalton Griner, Ran Zhang, Guang-Hong Chen, Univ. of Wisconsin School of Medicine and Public Health (United States)

12465-100

Using virtual monoenergetic images in Karhunen–Loève domain to differentiate lesion pathology

Author(s): Yongfeng Gao, Shaojie Chang, Marc Pomeroy, Stony Brook Univ. (United States); Lihong Li, College of Staten Island, The City Univ. of New York (United States); Zhengrong Liang, Stony Brook Univ. (United States)

12465-101

An investigation on energy spectral information of computed tomography for machine learning in lesion classification

Author(s): Daniel Liang, Ward Melville High School (United States); David Liang, The Univ. of Chicago (United States); Alice Wei, Cornell Univ. (United States); Ryan Kuo, Shaojie Chang, Marc Pomeroy, Yongfeng Gao, Stony Brook Univ. (United States)

12465-102

Classification of high-risk coronary plaques using radiomic analysis of multi-energy photon-counting-detector computed tomography (PCD-CT) images

Author(s): Chelsea A. Dunning, Prabhakar Rajiah, Scott Hsieh, Andrea Esquivel, Mariana Yalon, Nikkole Weber, Hao Gong, Joel G. Fletcher, Cynthia H. McCollough, Shuai Leng, Mayo Clinic (United States)

12465-103

Predicting future multiple sclerosis disease progression from MR scans

Author(s): Lara Dular, Univ. of Ljubljana (Slovenia); Gregor Brecl-Jakob, Univ. Medical Ctr. Ljubljana (Slovenia); Lina Savšek, General Hospital Celje (Slovenia); Jožef Magdic, Univ. Medical Ctr. Maribor (Slovenia); Žiga Špiclin, Univ. of Ljubljana (Slovenia)

12465-104 • 6:00 PM - 8:00 PM | Pacific A

Multi-view based computer-aided model with anatomical position prior for architectural distortion detection in digital breast tomosynthesis

Author(s): Xiangyuan Ma, Shantou Univ. (China); Zilong He, Southern Medical Univ. (China); Yue Li, Sun Yat-Sen Univ. (China); Weixiong Zeng, Southern Medical Univ. (China); Jiawei Pan, Sun Yat-Sen Univ. (China); Jialing Liu, Weimin Xu, Zeyuan Xu, Sina Wang, Chanjuan Wen, Hui Zeng, Jiefeng Wu, Zhaodong Zeng, Weiguo Chen, Southern Medical Univ. (China); Yao Lu, Sun Yat-Sen Univ. (China)

12465-105 • 6:00 PM - 8:00 PM | Pacific

Automatic segmentation of stroke lesions in T1-weighted magnetic resonance images with convolutional neural networks

Author(s): Aldir Sousa, Marcelo Arruda, José Eduardo Krieger, Marco Antonio Gutierrez, Instituto do Coração do Hospital das Clínicas, Univ. de São Paulo (Brazil)

12465-106 • 6:00 PM - 8:00 PM | Pacific A

Volumetric corpus callosum segmentation integrated to inCCsight software for supporting DTI-based studies

Author(s): João Vitor Alcantara, Joany Rodrigues, Paulo Rogério Julio, Simone Appenzeller, Letícia Rittner, Univ. of Campinas (Brazil)

12465-107 • 6:00 PM - 8:00 PM | Pacific A

Radiomics-based classification of autosomal dominant polycystic kidney disease (ADPKD) Mayo imaging classification (MIC) and the effect of gray-level discretization

Author(s): Linnea E. Kremer, Boris Fosso, Lucy Groothuis, Arlene Chapman, Samuel G. Armato, The Univ. of Chicago (United States)

12465-108 • 6:00 PM - 8:00 PM | Pacific A

An analytic, physics-based approach to scoring emphysema in lung CT patients

Author(s): John M. Hoffman, Univ. of California, Los Angeles (United States); Frederic Noo, Utah Ctr. for Advanced Imaging Research, The Univ. of Utah (United States); Michael McNitt-Gray, Univ. of California, Los Angeles (United States)

12465-109 • 6:00 PM - 8:00 PM | Pacific A

Renal parenchyma segmentation based on a cascaded self-adaptive framework with local context-aware mix-up regularization in abdominal MR images

Author(s): Heeyoung Jeong, Hyeonjin Kim, Helen Hong, Seoul Women's Univ. (Korea, Republic of); Dae Chul Jung, Kidon Chang, Koon Ho Rha, Yonsei Univ. College of Medicine (Korea, Republic of)

12465-110 • 6:00 PM - 8:00 PM | Pacific A

Cross modal global local representation learning from radiology reports and x-ray chest images

Author(s): Nathan Hadjiyski, Ali Vosoughi, Univ. of Rochester (United States); Axel Wismüller, Univ. of Rochester Medical Ctr. (United States)

12465-111 • 6:00 PM - 8:00 PM | Pacific A

Bladder cancer segmentation using U-Net based deep-learning

Author(s): Jonathan Clever, Lubomir Hadjiiski, Heang-Ping Chan, Richard H. Cohan, Elaine M. Caoili, Kenny H. Cha, Ravi K. Samala, Chuan Zhou, Univ. of Michigan (United States)

12465-112 • 6:00 PM - 8:00 PM | Pacific A

Bladder cancer treatment response assessment in CT urography by using deep-learning and radiomics

Author(s): Di Sun, Lubomir Hadjiiski, Heang-Ping Chan, Richard H. Cohan, Elaine M. Caoili, Ajjai Alva, Kenny H. Cha, Ravi K. Samala, Chuan Zhou, Univ. of Michigan (United States)

12465-113 • 6:00 PM - 8:00 PM | Pacific A

Classification of COVID-19 cases from chest CT volumes using hybrid model of 3D CNN and 3D MLP-mixer

Author(s): Masahiro Oda, Tong Zheng, Yuichiro Hayashi, Nagoya Univ. (Japan); Yoshito Otake, Nara Institute of Science and Technology (Japan); Masahiro Hashimoto, Keio Univ. School of Medicine (Japan); Toshiaki Akashi, Shigeki Aoki, Juntendo Univ. (Japan); Kensaku Mori, Nagoya Univ. (Japan)

12465-114 • 6:00 PM - 8:00 PM | Pacific A

A 2D U-NET combined model based on lesion size for automated stroke lesion segmentation

Author(s): Ipsa Singh Yadav, Prognostics In-Med Pvt. Ltd. (United States); Vaibhav Bahel, Prognostics In-Med Pvt. Ltd. (India); François De Guio, Prognostics In-Med Pvt. Ltd. (France); Juhi Desai, Prognostics In-Med Pvt. Ltd. (India); Latha Poonamallee, Prognostics In-Med Pvt. Ltd. (United States); Nikhil Gupta, Prognostics In-Med Pvt. Ltd. (India)

12465-115 • 6:00 PM - 8:00 PM | Pacific A

Medical knowledge-guided deep learning for mammographic breast density classification

Author(s): Long Gao, National Univ. of Defense Technology (China); Chang Liu, Dooman Arefan, Univ. of Pittsburgh (United States); Ashok Panigrahy, Margarita L. Zuley, Univ. of Pittsburgh Medical Ctr. (United States); Shandong Wu, Univ. of Pittsburgh (United States)

12465-116 • 6:00 PM - 8:00 PM | Pacific A

A hybrid model of deep learning features and clinical features for severe cases predication of COVID-19

Author(s): Titinunt Kitrungrotsakul, Zhejiang Lab. (China); Qingqing Chen, Sir Run Run Shaw Hospital (China); Huitao Wu, Baidu, Inc. (China); Preeyanuch Srichola, Kasetsart University (Thailand); Hongjie Hu, Wenchao Zhu, Chao Chen, Fangy Xu, Yong Zhou, Sir Run Run Shaw Hospital (China); Lanfen Lin, Ruofeng Tong, Jingsong Li, Zhejiang Univ. (China); Yen-Wei Chen, Ritsumeikan Univ. (Japan)

12465-117 • 6:00 PM - 8:00 PM | Pacific A

3D universal lesion detection and tagging in CT with self-training

Author(s): Jared Gregory Frazier, Tejas Sudharshan Mathai, Jianfei Liu, National Institutes of Health (United States); Angshuman Paul, Indian Institute of Technology Jodhpur (India); Ronald M. Summers, National Institutes of Health (United States)

12465-118 • 6:00 PM - 8:00 PM | Pacific A

Recognition of tooth numbers and conditions on dental panoramic radiographs for assisting dental chart filing

Author(s): Chisako Muramatsu, Shiga Univ. (Japan); Koki Sakai, Yuta Seino, Gifu Univ. (Japan); Ryo Takahashi, Tatsuro Hayashi, Media Co., Ltd. (Japan); Wataru Nishiyama, Asahi Univ. (Japan); Xiangrong Zhou, Takeshi Hara, Gifu Univ. (Japan); Akitoshi Katsumata, Asahi Univ. (Japan); Hiroshi Fujita, Gifu Univ. (Japan)

12465-119 • 6:00 PM - 8:00 PM | Pacific A

Survival prediction for patients with metastatic urothelial cancer after immunotherapy by machine learning

Author(s): Rain Tarango, Lubomir Hadjiiski, Ajjai Alva, Heang-Ping Chan, Richard H. Cohan, Elaine M. Caoili, Kenny H. Cha, Ravi K. Samala, Alon Z. Weizer, Chuan Zhou, Univ. of Michigan (United States); Monika Joshi, The Pennsylvania State Univ. (United States); Yousef Zakharia, The Univ. of Iowa (United States)

Conference 12465

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A
ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)
Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A
Human-AI collaboration *(Keynote Presentation)*
Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: BREAST

21 February 2023 • 10:30 AM - 11:50 AM | Town & Country C
Session Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States), Despina Kontos, Penn Medicine (United States)

12465-16 • 10:30 AM - 10:50 AM | Town & Country C
Multi-view DBT grid-attention detection framework
Author(s): Xuan Liu, Yinhao Ren, Duke Univ. (United States); Zisheng Liang, iCAD, Inc. (United States); Lars Grimm, Duke Univ. (United States); Jun Ge, iCAD, Inc. (United States); Joseph Lo, Duke Univ. (United States)

12465-17 • 10:50 AM - 11:10 AM | Town & Country C
Developing a task-oriented deep convolutional neural network application towards estimating near-term breast cancer risk: preliminary work
Author(s): Md Belayat Hossain, Juhun Lee, Univ. of Pittsburgh (United States)

12465-18 • 11:10 AM - 11:30 AM | Town & Country
End-to-end mammographic breast density quantification with deep learning: preliminary study on simulated mammograms
Author(s): Sjoerd Tunissen, Andrea Motta, Radboud Univ. Medical Ctr. (Netherlands); Franziska Mauter, Radboud Univ. Medical Ctr. (Netherlands), Physikalisch-Technische Bundesanstalt (Germany); Eloy García, Oliver Díaz, Univ. de Barcelona (Spain); John M. Boone, Department of Radiology, University of California Davis (United States), Department of Biomedical Engineering, University of California Davis (United States); Ioannis Sechopoulos, Radboud Univ. Medical Ctr. (Netherlands), Dutch Expert Ctr. for Screening (LRCB) (Netherlands), Univ. Twente (Netherlands); Marco Caballo, Radboud Univ. Medical Ctr. (Netherlands)

12465-19 • 11:30 AM - 11:50 AM | Town & Country C
Quantitative ultrasound radiomics for monitoring radiation-induced toxicity following breast radiotherapy
Author(s): Jing Wang, Boran Zhou, Mylin A. Torres, Xiaofeng Yang, Tian Liu, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 5: NOVEL APPLICATIONS

21 February 2023 • 1:20 PM - 3:00 PM | Town & Country C

Session Chairs: Susan M. Astley, The Univ. of Manchester (United Kingdom), Nicholas A. Petrick, U.S. Food and Drug Administration (United States)

12465-20 • 1:20 PM - 1:40 PM | Town & Country C
Identification of autism spectrum disorder based on MEWISPool and multi-modal learning
Author(s): Gaoya Shen, Yaping Wang, Zhengzhou Univ. (China); Xiujuan Geng, The Chinese Univ. of Hong Kong (China)

12465-21 • 1:40 PM - 2:00 PM | Town & Country C
Deep-learning based segmentation of the placenta and uterine cavity on prenatal MR images
Author(s): James Huang, The Univ. of Texas at Dallas (United States); Quyen Do, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Maysam Shahedi, The Univ. of Texas at Dallas (United States); Yin Xi, Matthew A. Lewis, Christina L. Herrera, David M. Owen, Catherine Spong, Ananth J. Madhuranthakam, Diane M. Twickler, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Baowei Fei, The Univ. of Texas at Dallas (United States), The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

12465-22 • 2:00 PM - 2:20 PM | Town & Country C
Automated classification of intravenous contrast enhancement phase of CT scans using residual networks
Author(s): Akshaya Anand, Jianfei Liu, National Institutes of Health (United States); Thomas C. Shen, National Institutes of Health Clinical Ctr. (United States); W. Marston Linehan, Peter A. Pinto, National Cancer Institute (United States); Ronald M. Summers, National Institutes of Health Clinical Ctr. (United States)

12465-23 • 2:20 PM - 2:40 PM | Town & Country C
Deep regression model with ordinal and triplet loss for the prediction of prostate cancer aggressiveness in multi-parametric MR images
Author(s): Yoon Jo Kim, Minjin Lee, Helen Hong, Seoul Women's Univ. (Korea, Republic of); Sung Il Hwang, Seoul National Univ. Bundang Hospital (Korea, Republic of)

12465-24 • 2:40 PM - 3:00 PM | Town & Country C
Opioid use disorder prediction using machine learning of fMRI data
Author(s): Ahmed Temtam, Old Dominion Univ. (United States); Liangsuo Ma, Gerard Moeller, Virginia Commonwealth Univ. (United States); Md Shibly Sadique, Khan M. Iftekharuddin, Old Dominion Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 6: AI

Joint Session with Conferences 12465 and 12467

21 February 2023 • 3:30 PM - 5:30 PM | Town & Country C

Session Chairs: Weijie Chen, U.S. Food and Drug Administration (United States), Yan Chen, The Univ. of Nottingham (United Kingdom)

12467-10 • 3:30 PM - 3:50 PM | Town & Country

Longitudinal robustness of a thoracic radiographic AI model for COVID-19 severity prediction

Author(s): Karen Drukker, Hui Li, Maryellen L. Giger, The Univ. of Chicago (United States)

12465-25 • 3:50 PM - 4:10 PM | Town & Country C

Assessing an AI-based smart imagery framing and truthing (SIFT) system to assist radiologists annotating lung abnormalities on chest x-ray images for development of deep learning models

Author(s): Lin Guo, Kunlei Hong, Shenzhen Zhiying Medical Imaging (China); Ziqi Zhang, Tsinghua-Berkeley Shenzhen Institute, Tsinghua University (China); Bin Zheng, The Univ. of Oklahoma (United States); Stefan Jaeger, U.S. National Library of Medicine, National Institutes of Health (United States); Jordan Fuhrman, Hui Li, Maryellen L. Giger, The Univ. of Chicago (United States); Andrei Gabrielian, Alex Rosenthal, Darrell E. Hurt, Ziv Yaniv, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Y.M. Fleming Lure, MS Technologies Corp. (United States)

12467-11 • 4:10 PM - 4:30 PM | Town & Country C

Developing and assessing an AI-based multi-task prediction system to assist radiologists detecting lung diseases in reading chest X-ray images

Author(s): Lin Guo, Kunlei Hong, Qian Xiao, Lingjun Qian, Shenzhen Zhiying Medical Imaging (China); Stefan Jaeger, U.S. National Library of Medicine (United States); Bin Zheng, The Univ. of Oklahoma (United States); Shenwen Quan, Li Xia, Shenzhen Zhiying Medical Imaging (China); Guanxun Cheng, Department of Radiology, Peking University Shenzhen Hospital (China); Y. M. Fleming Lure, MS Technologies Corp. (United States)

12465-26 • 4:30 PM - 4:50 PM | Town & Country C

How does image quality affect computer-aided diagnosis of colorectal polyps?

Author(s): Thom Scheeve, Nikoo Dehghani, Technische Univ. Eindhoven (Netherlands); Quirine E. W. van der Zander, Ayla Thijssen, Maastricht Univ. (Netherlands); Ramon-Michel Schreuder, Catharina Hospital (Netherlands); Ad A. M. Masclee, Maastricht Univ. Medical Ctr. (Netherlands); Erik J. Schoon, Catharina Hospital (Netherlands); Fons van der Sommen, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands)

12467-12 • 4:50 PM - 5:10 PM | Town & Country C

Assistance tools for the evaluation of machine learning algorithm performance: the decision tree based tools developed by the Medical Imaging and Data Resource Center (MIDRC) Technology Development Project (TDP) 3c effort

Author(s): Karen Drukker, The Univ. of Chicago (United States); Berkman Sahiner, Tingting Hu, U.S. Food and Drug Administration (United States); Grace H. Kim, David Geffen School of Medicine, Univ. of California, Los Angeles (United States); Heather M. Whitney, Natalie Baughan, The Univ. of Chicago (United States); Kyle J. Myers, Puente Solutions, LLC (United States); Maryellen L. Giger, The Univ. of Chicago (United States); Michael F. McNitt-Gray, David Geffen School of Medicine, Univ. of California, Los Angeles (United States)

12465-27 • 5:10 PM - 5:30 PM | Town & Country C

Automated right coronary artery localizer using deep learning for optimal cardiac phase selection

Author(s): Chih-Chieh Liu, Qiulin Tang, Liang Cai, Zhou Yu, Jian Zhou, Canon Medical Research USA, Inc. (United States)

Live Demonstrations Workshop

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

**Deep Learning in Medical Image Formation:
Current Status and Future Directions**

21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Conference 12465

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: DEEP LEARNING I

22 February 2023 • 10:30 AM - 11:50 AM | Town & Country C
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Hayit Greenspan, Tel Aviv Univ. (Israel)

12465-28 • 10:30 AM - 10:50 AM | Town & Country C
Class activation mapping and uncertainty estimation in multi-organ segmentation
Author(s): Md Shibly Sadique, Walia Farzana, Ahmed Temtam, Khan M. Iftekharuddin, Old Dominion Univ. (United States)

12465-29 • 10:50 AM - 11:10 AM | Town & Country C
Non-invasive classification of IDH mutation status of gliomas from multi-modal MRI using a 3D convolutional neural network
Author(s): Satrajit Chakrabarty, Washington Univ. in St. Louis (United States); Pamela LaMontagne, Joshua Shimony, Daniel S. Marcus, Aristeidis Sotiras, Washington Univ. School of Medicine in St. Louis (United States)

12465-30 • 10:50 AM - 11:10 AM | Town & Country C
Siam-VAE: a hybrid deep learning based anomaly detection framework for automated quality control of head CT scans
Author(s): Soumyendu S. Ghosh, Washington Univ. in St. Louis (United States); Rajat Dhar, Daniel S. Marcus, Aristeidis Sotiras, Washington Univ. School of Medicine in St. Louis (United States)

12465-51 • 10:50 AM - 11:10 AM | Town & Country C
Classification of point-of-care ultrasound in breast imaging using deep learning
Author(s): Jennie Karlsson, Ida Arvidsson, Freja Sahlin, Karl Åström, Niels Christian Overgaard, Lund Univ. (Sweden); Kristina Lång, Lund Univ. (Sweden), Unilabs Mammography Unit, Skåne Univ. Hospital (Sweden); Anders Heyden, Lund Univ. (Sweden)

Lunch Break 11:50 AM - 1:20 PM

SESSION 8: EYE AND RETINA

22 February 2023 • 1:20 PM - 3:00 PM | Town & Country C
Session Chairs: Chuan Zhou, Michigan Medicine (United States), Catalin Fetita, Télécom SudParis (France)

12465-32 • 1:20 PM - 1:40 PM | Town & Country C
A vision-GNN framework for retinopathy classification using optical coherence tomography
Author(s): Mingzhe Hu, Emory Univ. (United States); Jing Wang, Jacob Wynne, Tian Liu, Xiaofeng Yang, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States)

12465-33 • 1:40 PM - 2:00 PM | Town & Country C
Shape-based segmentation of retinal layers and fluids in OCT image data
Author(s): Timo Kepp, Julia Andresen, Univ. zu Lübeck (Germany); Claus von der Burchard, Christian-Albrechts-Univ. zu Kiel (Germany); Johann Roider, Univ. Eye Hospital (Germany); Gereon Hüttmann, Univ. zu Lübeck (Germany); Heinz Handels, Univ. zu Lübeck (Germany), Deutsches Forschungszentrum für Künstliche Intelligenz GmbH (Germany)

12465-34 • 2:00 PM - 2:20 PM | Town & Country C
Overcoming the sensor delta for semantic segmentation in OCT images
Author(s): Joshua Niemeijer, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Jan Ehrhardt, Timo Kepp, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany); Jörg Peter Schäfer, Deutsches Zentrum für Luft- und Raumfahrt e.V. (Germany); Heinz Handels, Institut für Medizinische Informatik, Univ. zu Lübeck (Germany)

12465-35 • 2:20 PM - 2:40 PM | Town & Country C
Correcting class imbalances with self-training for improved universal lesion detection and tagging
Author(s): Alexander Te-Wei Shieh, Tejas Sudharshan Mathai, Jianfei Liu, National Institutes of Health (United States); Angshuman Paul, Indian Institute of Technology Jodhpur (India); Ronald M. Summers, National Institutes of Health (United States)

12465-36 • 2:40 PM - 3:00 PM | Town & Country C
Multi-label ocular abnormalities detection with semantic dictionary learning
Author(s): Anneke Annassia Putri Siswadi, Univ. de Bourgogne (France), Univ. Gunadarma (Indonesia); Stéphanie Bricq, Fabrice Meriaudeau, Univ. de Bourgogne (France)

Coffee Break 3:00 PM - 3:30 PM

SESSION 9: SEGMENTATION

22 February 2023 • 3:30 PM - 5:30 PM | Town & Country C

Session Chair: Thomas Martin Deserno, Peter L. Reichertz Institut für Medizinische Informatik (Germany)

12465-37 • 3:30 PM - 3:50 PM | Town & Country C

Fully automated aortic measurements via CNN-based joint segmentation and localization

Author(s): Sudeep Katakol, Univ. of Michigan (United States); Zhangxing Bian, Johns Hopkins Univ. (United States); Yanglong Lu, Greg Spahlinger, Univ. of Michigan (United States); Charles Hatt, Imbio, LLC (United States); Nicholas Burris, Univ. of Michigan (United States)

12465-38 • 3:50 PM - 4:10 PM | Town & Country C

Drusen segmentation in color fundus photographs for drusenoid pigment epithelial detachment patients based on ground-truth derived from SD-OCTs

Author(s): Souvick Mukherjee, Tharindu De Silva, National Eye Institute (United States); Catherine Cukras, National Eye Institute, National Institutes of Health (United States)

12465-39 • 4:10 PM - 4:30 PM | Town & Country C

Can multiple segmentation methods enhance deep learning networks generalization? A novel hybrid learning paradigm

Author(s): Francesco Marzola, Kristen Meiburger, Filippo Molinari, Massimo Salvi, Politecnico di Torino (Italy)

12465-40 • 4:30 PM - 4:50 PM | Town & Country C

Improved ascites segmentation with bladder identification using anatomical location residual U-Net

Author(s): Manas K. Nag, Jianfei Liu, Seung Yeon Shin, Benjamin Hou, Liangchen Liu, National Institutes of Health Clinical Ctr. (United States); Perry J. Pickhardt, Department of Radiology, University of Wisconsin (United States); Jung-Min Lee, National Cancer Institute, National Institutes of Health (United States); Ronald M. Summers, National Institutes of Health Clinical Ctr. (United States)

12465-41 • 4:50 PM - 5:10 PM | Town & Country C

MISS-tool: medical image segmentation synthesis tool to emulate segmentation errors

Author(s): Shuyue Guan, Ravi K. Samala, Arian Arab, Weijie Chen, U.S. Food and Drug Administration (United States)

12465-42 • 5:10 PM - 5:30 PM | Town & Country C

Automated detection method of thoracic aorta calcification from non-contrast CT images using mediastinal anatomical label map

Author(s): Hidenobu Suzuki, Yoshiki Kawata, Tokushima Univ. (Japan); Toshihiko Sugiura, Nobuhiro Tanabe, Chiba Univ. (Japan); Yuji Matsumoto, Takaaki Tsuchida, Masahiko Kusumoto, National Cancer Ctr. Hospital (Japan); Kazuyoshi Marumo, Masahiro Kaneko, Tokyo Health Service Association (Japan); Noboru Niki, Medical Science Institute, Inc. (Japan)

THURSDAY 23 FEBRUARY

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A

Seeing and feeling in robot-assisted surgery
(Keynote Presentation)

Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A

Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)

Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: HEAD, NECK, AND MUSCULOSKELETAL

23 February 2023 • 10:30 AM - 11:50 AM | Town & Country C

Session Chairs: Lubomir M. Hadjiiski, Michigan Medicine (United States), Aimilia Gastounioti, Penn Medicine (United States)

12465-43 • 10:30 AM - 10:50 AM | Town & Country C

Audio-visual feature fusion for improved thoracic disease classification

Author(s): Moinak Bhattacharya, Prateek Prasanna, Stony Brook Univ. (United States)

12465-44 • 10:50 AM - 11:10 AM | Town & Country C

Unsupervised anomaly detection of paranasal anomalies in the maxillary sinus

Author(s): Debayan Bhattacharya, Technische Univ. Hamburg-Harburg (Germany), Universitätsklinikum Hamburg-Eppendorf (Germany); Finn Behrendt, Technische Univ. Hamburg-Harburg (Germany); Benjamin Tobias Becker, Dirk Beyersdorff, Elina Petersen, Marvin Petersen, Bastian Cheng, Dennis Eggert, Christian Betz, Anna Sophie Hoffmann, Universitätsklinikum Hamburg-Eppendorf (Germany); Alexander Schlaefer, Technische Univ. Hamburg-Harburg (Germany)

12465-45 • 11:10 AM - 11:30 AM | Town & Country C

Predicting the need for a replan in oropharyngeal cancer: a radiomic, clinical, and dosimetric model

Author(s): Tricia Chinnery, Pencilla Lang, Anthony Nichols, Sarah Mattonen, Western Univ. (Canada)

Conference 12465

12465-46 • 11:30 AM - 11:50 AM | Town & Country C

Towards fracture risk assessment by deep-learning-based classification of prevalent vertebral fractures

Author(s): Eren Bora Yilmaz, Universitätsklinikum Schleswig-Holstein (Germany), Ostfalia Hochschule für angewandte Wissenschaften (Germany); Tobias Fricke, Universitätsklinikum Schleswig-Holstein (Germany); Julian Laue, Ostfalia Hochschule für angewandte Wissenschaften (Germany); Constanze Polzer, Sam Sedaghat, Jan-Bernd Hoevener, Claus-Christian Glüer, Universitätsklinikum Schleswig-Holstein (Germany); Carsten Meyer, Ostfalia Hochschule für angewandte Wissenschaften (Germany)

Lunch Break 11:50 AM - 1:20 PM

SESSION 11: DEEP LEARNING II

23 February 2023 • 1:20 PM - 3:00 PM | Town & Country C
Session Chairs: Ronald M. Summers, National Institutes of Health Clinical Ctr. (United States), Pallavi Tiwari, Univ. of Wisconsin-Madison (United States)

12465-47 • 1:20 PM - 1:40 PM | Town & Country C

Universal lymph node detection in multiparametric MRI with selective augmentation

Author(s): Tejas Sudharshan Mathai, Sungwon Lee, Thomas C. Shen, Zhiyong Lu, Ronald M. Summers, National Institutes of Health (United States)

12465-48 • 1:40 PM - 2:00 PM | Town & Country

3D patch-based CNN for fissure segmentation on CT images to quantitatively assess fissure integrity and evaluate emphysema patients for endobronchial valve treatment

Author(s): Dallas Tada, Pangyu Teng, Michael McNitt-Gray, Grace H. Kim, Matthew S. Brown, Jonathan Goldin, Kalyani Vyapari, Ashley Banola, Univ. of California, Los Angeles (United States)

23 February 2023 C

12465-49 • 2:00 PM - 2:20 PM | Town & Country C

Effect of domain-specific self-supervised pretraining on predictive uncertainty for colorectal polyp characterization

Author(s): Nikoo Dehghani, Thom Scheeve, Tim G. W. Boers, Technische Univ. Eindhoven (Netherlands); Quirine E. W. van der Zander, Ayla Thijssen, Maastricht Univ. Medical Ctr. (Netherlands); Ramon-Michel Schreuder, Catharina Hospital (Netherlands); Ad A. M. Masclee, Maastricht Univ. Medical Ctr. (Netherlands); Erik J. Schoon, Catharina Hospital (Netherlands); Fons van der Sommen, Technische Univ. Eindhoven (Netherlands), Eindhoven Artificial Intelligence Systems Institute (Netherlands); Peter H. N. de With, Technische Univ. Eindhoven (Netherlands)

12465-50 • 2:20 PM - 2:40 PM | Town & Country C

Vicinal decision region analysis of deep learning models for medical images

Author(s): Alexis Burgon, Nicholas Petrick, Berkman Sahiner, Gene Pennello, Ravi K. Samala, U.S. Food and Drug Administration (United States)

12465-31 • 2:40 PM - 3:00 PM | Town & Country C

Probabilistic 3D segmentation for aleatoric uncertainty quantification in full 3D medical data

Author(s): Christiaan Viviers, Amaan Valiuddin, Peter H. N. de With, Fons van der Sommen, Technische Univ. Eindhoven (Netherlands)

Coffee Break 3:00 PM - 3:30 PM

SESSION 12: LUNG AND ABDOMEN

23 February 2023 • 3:30 PM - 5:30 PM | Town & Country C
Session Chairs: Fabrice Mériaudeau, Univ. de Bourgogne (France), Sameer K. Antani, U.S. National Library of Medicine (United States)

12465-52 • 3:30 PM - 3:50 PM | Town & Country C

CT-HARMONICA: physics-based CT harmonization for reliable lung density quantification

Author(s): Saman Sotoudeh-Paima, Duke Univ. (United States); Ehsan Samei, Ehsan Abadi, Duke Univ. School of Medicine (United States)

12465-53 • 3:50 PM - 4:10 PM | Town & Country C

Gate-SBNet: gate semantic boundary network for colorectal polyp segmentation

Author(s): Jun Wang, Zhejiang Univ. (China); Jihong Sun, Affiliated Sir Run Run Shaw Hospital of Zhejiang University (China); Xiaoyin Xu, Harvard Medical School (United States); Min Zhang, Zhejiang Univ. (China)

12465-55 • 4:30 PM - 4:50 PM | Town & Country C

Fully automated cascaded approach for renal mass detection on T2 weighted MRI images

Author(s): Rohini Gaikar, Univ. of Guelph (Canada); Azar Azad, A.I. VALI Inc. (Canada); Nicola Schieda, Univ. of Ottawa (Canada); Eranga Ukwatta, Univ. of Guelph (Canada)

12465-56 • 4:50 PM - 5:10 PM | Town & Country C

Deep learning for improved polyp detection from synthetic narrow-band imaging

Author(s): Mathias Ramm Haugland, Norwegian Univ. of Science and Technology (Norway); Hemin Ali Qadir, Ilangko Balasingham, Oslo Univ. Hospital (Norway)

12465-57 • 5:10 PM - 5:30 PM | Town & Country C

No nodule left behind: evaluating lung nodule malignancy classification with different stratification schemes

Author(s): Thomas Zeng, Carleton College (United States); Elias Furst, Milwaukee School of Engineering (United States); Yiyang Wang, Roselyne Tchoua, Jacob Furst, Daniela Raicu, DePaul Univ. (United States)

DIGITAL POSTERS

19 February 2023 • 8:00 AM - 8:00 AM | On Demand
The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12465-75

Towards a relation extractor U-shaped network for accurate pulmonary vessel segmentation in CT images

Author(s): Jiabao Jin, Yu Wu, Gang Ding, Ying Ma, Xiamen Univ. (China); Hui-Qing Zeng, Sunkui Ke, Xiangxing Chen, Miao Wang, Zhongshan Hospital (China), Xiamen Univ. (China); Yinran Chen, Xiongbiao Luo, Xiamen Univ. (China)

12465-80

Densely encoded attention networks for accurate retinal layers segmentation in optical coherence tomography

Author(s): Ying Ma, Xiamen Univ. (China); Jiabao Jin, Guanping Xu, Ao Wang, Yinran Chen, Xiamen University (China); Weijie Ouyang, Xiang'an Hospital ,School of Medicine, Xiamen University (China); Xiang Lin, Xiang'an Hospital, School of Medicine, Xiamen University (China); Zuguo Liu, Xiang'an Hospital ,School of Medicine, Xiamen University (China); Xiongbiao Luo, Xiamen University (China), National Institute for Data Science in Health and Medicine, Xiamen University (China), Division of Intelligent Instrumentation and Devices, Xiamen University (China)

CONFERENCE 12466

Image-Guided Procedures, Robotic Interventions, and Modeling

19 - 23 February 2023 | Pacific C

Conference Chairs: **Cristian A. Linte,** Rochester Institute of Technology (United States); **Jeffrey H. Siewerdsen,** The Univ. of Texas MD Anderson Cancer Ctr. (United States)

Program Committee: **Purang Abolmaesumi,** The Univ. of British Columbia (Canada), **Kristy K. Brock,** The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); **Matthieu Chabanas,** Univ. Grenoble Alpes (France); **Elvis C. S. Chen,** Robarts Research Institute (Canada); **Sandy Engelhardt,** Ruprecht-Karls-Univ. Heidelberg (Germany); **Rebecca Fahrig,** Siemens Healthineers (Germany); **Baowei Fei,** The Univ. of Texas at Dallas (United States); **Gabor Fichtinger,** Queen's Univ. (Canada); **Ryan J. Halter,** Thayer School of Engineering at Dartmouth (United States); **David R. Haynor,** Univ. of Washington (United States); **William E. Higgins,** The Pennsylvania State Univ. (United States); **David R. Holmes,** Mayo Clinic (United States); **Pierre Jannin,** Univ. de Rennes 1 (France); **David M. Kwartowitz,** Grand Canyon Univ. (United States); **Shuo Li,** Case Western Reserve Univ. (United States); **Michael I. Miga,** Vanderbilt Univ. (United States); **Kensaku Mori,** Nagoya Univ. (Japan); **Parvin Mousavi,** Queen's Univ. (Canada); **Jack H. Noble,** Vanderbilt Univ. (United States); **Maryam E. Rettmann,** Mayo Clinic (United States); **Eric J. Seibel,** Univ. of Washington (United States); **Amber L. Simpson,** Queen's Univ. (Canada); **Stefanie Speidel,** National Ctr. for Tumor Diseases Dresden (Germany); **Tamas Ungi,** Queen's Univ. (Canada); **Satish E. Viswanath,** Case Western Reserve Univ. (United States); **Robert J. Webster,** Vanderbilt Univ. (United States); **Ivo Wolf,** Hochschule Mannheim (Germany); **Ziv R. Yaniv,** National Institute of Allergy and Infectious Diseases (United States); **Terry S. Yoo,** The Univ. of Maine (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: **Symposium Chair Welcome and Best Student Paper Award Announcement**

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

5:40 pm: **New SPIE Fellows Acknowledgments**

5:45 pm: **SPIE Harrison H. Barrett Award in Medical Imaging**
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments *(Plenary Presentation)*

Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement**

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: VIDEO: ADVANCES IN ENDOSCOPY

20 February 2023 • 10:30 AM - 11:50 AM | Pacific C
Session Chairs: Matthieu Chabanas, Univ. Grenoble Alpes (France), Jack H. Noble, Vanderbilt Univ. (United States)

12466-1 • 10:30 AM - 10:50 AM | Pacific C
Extemporaneous airway route computation during live bronchoscopic procedures
Author(s): Yuxuan He, William E. Higgins, The Pennsylvania State Univ. (United States)

CONFERENCE 12466

12466-2 • 10:50 AM - 11:10 AM | Pacific C

Real bronchoscopic images-based bronchial nomenclature: a preliminary study

Author(s): Cheng Wang, Yuichiro Hayashi, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Hirotsugu Takabatake, Minami Sanjyo Hospital (Japan); Masaki Mori, Sapporo Kosei Hospital (Japan); Hiroshi Natori, Nishioka Hospital (Japan); Kensaku Mori, Nagoya Univ. (Japan)

12466-3 • 11:10 AM - 11:30 AM | Pacific C

Real-time 3D neuroendoscopic guidance using SLAM: first clinical studies

Author(s): Prasad Vagdargi, Johns Hopkins Univ. (United States); Ali Uneri, The Johns Hopkins Univ. School of Medicine (United States); Craig K. Jones, Johns Hopkins Univ. (United States); Xiaoxuan Zhang, Pengwei Wu, Runze Han, Alejandro Sisniega, Junghoon Lee, The Johns Hopkins Univ. School of Medicine (United States); Patrick A. Helm, Medtronic, Inc. (United States); Mark G. Luciano, William S. Anderson, The Johns Hopkins Univ. School of Medicine (United States); Gregory Hager, Johns Hopkins Univ. (United States); Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12466-4 • 11:30 AM - 11:50 AM | Pacific C

A semantic segmentation method for laparoscopic images using semantically similar groups

Author(s): Leo Uramoto, Yuichiro Hayashi, Masahiro Oda, Nagoya Univ. (Japan); Takayuki Kitasaka, Aichi Institute of Technology (Japan); Kazunari Misawa, Aichi Cancer Ctr. Research Institute (Japan); Kensaku Mori, Nagoya Univ. (Japan)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: VIDEO: ROBOTIC/LAPAROSCOPIC SYSTEMS

20 February 2023 • 1:20 PM - 3:00 PM | Pacific C

Session Chairs: Baowei Fei, The Univ. of Texas at Dallas (United States), Cristian A. Linte, Rochester Institute of Technology (United States)

12466-5 • 1:20 PM - 1:40 PM | Pacific C

Open source video-based hand-eye calibration

Author(s): Tara N. Kemper, Univ. of Western Ontario (Canada); Daniel R. Allen, Univ. of Western Ontario (Canada); Adam Rankin, Western Univ. (Canada); Terry M. Peters, Elvis C. S. Chen, Univ. of Western Ontario (Canada)

12466-6 • 1:40 PM - 2:00 PM | Pacific C

A disparity refinement framework for learning-based stereo matching methods in cross-domain setting for laparoscopic images

Author(s): Zixin Yang, Richard Simon, Cristian Linte, Rochester Institute of Technology (United States)

12466-7 • 2:00 PM - 2:20 PM | Pacific C

A high-speed hyperspectral laparoscopic imaging system

Author(s): Kelden Pruitt, The Univ. of Texas at Dallas (United States); Brett Johnson, Jeffrey Gahan, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Ling Ma, Baowei Fei, The Univ. of Texas at Dallas (United States)

12466-8 • 2:20 PM - 2:40 PM | Pacific C

Laparoscopic photoacoustic imaging system integrated with the da Vinci Surgical System

Author(s): Shang Gao, Yang Wang, Haoying Zhou, Kehan Yang, Yiwei Jiang, Liang Lu, Shiyue Wang, Xihan Ma, Benjamin Nephew, Loris Fichera, Gregory S. Fischer, Haichong K. Zhang, Worcester Polytechnic Institute (United States)

12466-9 • 2:40 PM - 3:00 PM | Pacific C

Evaluating a PSMNet-based pipeline for intraoperative stereo reconstruction with the da Vinci Xi

Author(s): Michael A. Kokko, Thayer School of Engineering at Dartmouth (United States); Lucas Andersen, Thayer School of Engineering at Dartmouth (United States); Ryan J. Halter, Thayer School of Engineering at Dartmouth (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: SURGICAL DATA SCIENCE/ANALYSIS

20 February 2023 • 3:30 PM - 5:30 PM | Pacific C

Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), David R. Holmes, Mayo Clinic (United States)

12466-10 • 3:30 PM - 3:50 PM | Pacific C

Self-supervised learning and uncertainty estimation for surgical margin detection

Author(s): Ayesha Syeda, Queen's Univ. (Canada); Fahimeh Fooladgar, The Univ. of British Columbia (Canada); Amoon Jamzad, Martin Kaufmann, Kevin Ren, Jay Engel, Ross Walker, Shaila Merchant, Doug McKay, Sonal Varma, Gabor Fichtinger, John F. Rudan, Parvin Mousavi, Dilakshan Srikanthan, Queen's Univ. (Canada)

12466-11 • 3:50 PM - 4:10 PM | Pacific C

Using uncertainty quantification to improve reliability of video-based skill assessment metrics in central venous catheterization

Author(s): Catherine Austin, Rebecca J. Hisey, Olivia O'Driscoll, Tamas Ungi, Gabor Fichtinger, Lab. for Percutaneous Surgery (Canada)

12466-12 • 4:10 PM - 4:30 PM | Pacific C

Cautery tool state detection using deep learning on intraoperative surgery videos

Author(s): Lucas March, Jessica R. Rodgers, Rebecca J. Hisey, Amoon Jamzad, Alice Santilli, Doug McKay, John F. Rudan, Martin Kaufmann, Kevin Ren, Gabor Fichtinger, Parvin Mousavi, Queen's Univ. (Canada)

12466-13 • 4:30 PM - 4:50 PM | Pacific C

Using object detection for surgical tool recognition in simulated open inguinal hernia repair surgery

Author(s): Kian Hashtrudi-Zaad, Rebecca J. Hisey, Elizabeth H. Klosa, Boris Zevin, Tamas Ungi, Gabor Fichtinger, Queen's Univ. (Canada)

12466-14 • 4:50 PM - 5:10 PM | Pacific C

Self-supervised surgical instrument 3D reconstruction from a single camera image

Author(s): Ange Lou, Xing Yao, Ziteng Liu, Jintong Han, Jack H. Noble, Vanderbilt Univ. (United States)

12466-15 • 5:10 PM - 5:30 PM | Pacific C

Improved tool tracking algorithm for eye surgery based on combined color space masks

Author(s): Krzysztof Gromada, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland), Institute of Automation and Robotics, Warsaw Univ. of Technology (Poland); Bartlomiej Piotrowski, International Ctr. for Translational Eye Research (Poland), Institute of Automation and Robotics, Warsaw Univ. of Technology (Poland), Institute of Physical Chemistry (Poland); Piotr Ciacka, Adam Kurek, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland); Andrea Curatolo, International Ctr. for Translational Eye Research (Poland), Institute of Physical Chemistry (Poland)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A

ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)

Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A

Human-AI collaboration *(Keynote Presentation)*

Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: CANCER INTERVENTION AND ANALYSIS

21 February 2023 • 10:30 AM - 11:50 AM | Pacific C

Session Chairs: Amber L. Simpson, Queen's Univ. (Canada), Maryam E. Rettmann, Mayo Clinic (United States)

12466-16 • 10:30 AM - 10:50 AM | Pacific C

Bi-objective optimization of organ properties for the simulation of intracavitary brachytherapy applicator placement in cervical cancer

Author(s): Cedric J. Rodriguez, Stephanie M. de Boer, Leiden Univ. Medical Ctr. (Netherlands); Peter A. N. Bosman, Ctr. Wiskunde & Informatica (Netherlands); Tanja Alderliesten, Leiden Univ. Medical Ctr. (Netherlands)

12466-17 • 10:50 AM - 11:10 AM | Pacific C

Multi-catheter modelling in reconstructed 3D transrectal ultrasound images from prostate brachytherapy

Author(s): Nicole Kitner, Jessica R. Rodgers, Tamas Ungi, Queen's Univ. (Canada); Martin Korzeniowski, Tim Olding, Chandra P. Joshi, Kingston Health Sciences Ctr. (Canada); Parvin Mousavi, Gabor Fichtinger, Queen's Univ. (Canada)

12466-18 • 11:10 AM - 11:30 AM | Pacific C

Evaluation of a perineal access device for MRI-guided prostate interventions

Author(s): Pezhman Foroughi, Purnima Rajan, Martin Hossbach, Alican Demir, Jan Hämmelmann, Clear Guide Medical Inc. (United States); Lance A. Mynderse, David A. Woodrum, Mayo Clinic (United States)

12466-19 • 11:30 AM - 11:50 AM | Pacific C

Integrating multi-plane and multi-region radiomic features to predict pathologic response to neoadjuvant chemoradiation in rectal cancers via pre-treatment MRI

Author(s): Thomas DeSilvio, Dhruv Seth, Sneha Singh, Atreya Sridharan, Case Western Reserve Univ. (United States); Katherine Bingmer, Diana Jodeh, Univ. Hospitals Cleveland Medical Ctr. (United States); Andrei S. Purysko, Cleveland Clinic (United States); Eric L. Marderstein, Louis Stokes Cleveland Dept. of Veterans Affairs Medical Ctr. (United States); Rajmohan Paspulati, Kenneth A. Friedman, Sharon L. Stein, Univ. Hospitals Cleveland Medical Ctr. (United States); Satish E. Viswanath, Case Western Reserve Univ. (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 5: IMAGE-GUIDED LIVER INTERVENTIONS

21 February 2023 • 1:20 PM - 3:10 PM | Pacific C

Session Chairs: Michael I. Miga, Vanderbilt Univ. (United States), Kristy K. Brock, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

1:20 PM:
(Invited Paper)
Kristy K. Brock, The Univ. of Texas M.D. Anderson Cancer Ctr.

12466-92 • 1:20 PM - 1:50 PM | Pacific C

Advancing image-guided liver ablation through biomechanical modeling and AI *(Invited Paper)*

Author(s): Kristy K. Brock, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12466-20 • 1:50 PM - 2:10 PM | Pacific C

Comparison study of sparse data-driven soft tissue registration: preliminary results from the image-to-physical liver registration sparse data challenge

Author(s): Jon S. Heiselman, Memorial Sloan-Kettering Cancer Ctr. (United States), Vanderbilt Univ. (United States); Jarrod A. Collins, Morgan J. Ringel, Vanderbilt Univ. (United States); William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (United States); Michael I. Miga, Vanderbilt Univ. (United States)

12466-21 • 2:10 PM - 2:30 PM | Pacific C

Comparison study of intraoperative surface acquisition methods for surgical navigation

Author(s): Bowen Xiang, Jon S. Heiselman, Winona L. Richey, Vanderbilt Univ. (United States); William R. Jarnagin, Memorial Sloan-Kettering Cancer Ctr. (United States); Michael I. Miga, Vanderbilt Univ. (United States)

12466-22 • 2:30 PM - 2:50 PM | Pacific C

Real-time liver motion estimation via combined surface imaging and single x-ray imaging using a deep learning-based approach (Surf-X)

Author(s): Hua-Chieh Shao, Yunxiang Li, Jing Wang, Steve Jiang, You Zhang, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

12466-23 • 2:50 PM - 3:10 PM | Pacific C

Deformable motion compensation for intraprocedural vascular cone-beam CT with sequential projection domain targeting and vessel-enhancing autofocus

Author(s): Alexander Lu, Heyuan Huang, Yicheng Hu, Wojciech Zbijewski, Mathias Unberath, The Johns Hopkins Univ. School of Medicine (United States); Jeffrey H. Siewerdsen, The Johns Hopkins Univ. School of Medicine (United States), The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Clifford R. Weiss, Alejandro Sisniega, The Johns Hopkins Univ. School of Medicine (United States)

Coffee Break 3:10 PM - 3:40 PM

CONFERENCE 12466

21 February 2023 • 3:40 PM - 5:50 PM | Pacific C

Session Chairs: Cristian A. Linte, Rochester Institute of Technology (United States), Satish E. Viswanath, Case Western Reserve Univ. (United States)

12466-91 • 3:40 PM - 4:10 PM | Pacific C
Proton beam ablation of ventricular tachycardia
(Invited Paper)
Author(s): Maryam E. Rettmann, Mayo Clinic (United States)

21 February 2023
Show Abstract +

12466-24 • 4:10 PM - 4:30 PM | Pacific C
Prediction of free-breathing 4DCT lung deformation using probabilistic motion auto-encoders
Author(s): Emilie Ouraou, Liset Vázquez Romaguera, Polytechnique Montréal (Canada); Marion Tonneau, Houda Bahig, Ctr. Hospitalier de l'Univ. de Montréal (Canada); Samuel Kadoury, Polytechnique Montréal (Canada)

12466-25 • 4:30 PM - 4:50 PM | Pacific C
Statistical model for the prediction of lung deformation during video-assisted thoracoscopic surgery
Author(s): Valentin Boussot, Jean-Louis Dillenseger, Lab. Traitement du Signal et de l'Image (France)

12466-26 • 4:50 PM - 5:10 PM | Pacific C
Auto-segmentation of thoraco-abdominal organs in free breathing pediatric dynamic MRI
Author(s): Yusuf Akhtar, Univ. of Pennsylvania (United States); Jayaram K. Udupa, Yubing Tong, Univ. of Pennsylvania (United States); Tiange Liu, Yanshan Univ. (China); Caiyun Wu, Dewey Odhner, Univ. of Pennsylvania (United States); Joseph M. McDonough, Carina Lott, Abigail Clark, Jason B. Anari, Patrick Cahill, The Children's Hospital of Philadelphia (United States); Drew A. Torigian, Univ. of Pennsylvania (United States)

12466-27 • 5:10 PM - 5:30 PM | Pacific C
Dynamic 3D imaging of contrast medium flow on an interventional C-arm using a pulsed injection protocol
Author(s): Erick Oberstar, Martin Wagner, Univ. of Wisconsin-Madison (United States); Mariya Pravdivtseva, Christian-Albrechts-Univ. zu Kiel (Germany); Jingfeng Jiang, Michigan Technological Univ. (United States); Michael A. Speidel, Univ. of Wisconsin-Madison (United States)

12466-28 • 5:30 PM - 5:50 PM | Pacific C
a 4D visualization tool for treatment planning of non-invasive radioablation in patients with ventricular tachycardia
Author(s): Connor Haberl, Carleton Univ. (Canada); Andrew Crean, Univ. of Ottawa Heart Institute (Canada); Graham Cook, The Ottawa Hospital (Canada); Fateme Rajabiyazdi, Carleton Univ. (Canada); Calum Redpath, Robert deKemp, Univ. of Ottawa Heart Institute (Canada)

Deep Learning in Medical Image Formation: Current Status and Future Directions
21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A
Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A
Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A
Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: IMAGING/ANALYSIS FOR SURGICAL GUIDANCE

22 February 2023 • 10:30 AM - 11:50 AM | Pacific C
Session Chairs: Shuo Li, Western Univ. (Canada), Ziv R. Yaniv, National Institute of Allergy and Infectious Diseases (United States)

12466-29 • 10:30 AM - 10:50 AM | Pacific C
Automatic chorda tympani segmentation with weakly supervised conditional adversarial networks
Author(s): Rueben A. Banalagay, Jack H. Noble, Vanderbilt Univ. (United States)

12466-30 • 10:50 AM - 11:10 AM | Pacific C
Self-supervised registration and segmentation on ossicles with a single ground truth label
Author(s): Yike Zhang, Jack H. Noble, Vanderbilt Univ. (United States)

12466-31 • 11:10 AM - 11:30 AM | Pacific C
Revealing pelvic structures in the presence of metal hip prostheses via non-circular CBCT orbits
Author(s): Tess Reynolds, The Univ. of Sydney (Australia); Yiqun Ma, Tianyu Wang, Johns Hopkins Univ. (United States); Kai Mei, Peter B. Noel, Univ. of Pennsylvania (United States); Grang J. Gang, Joseph W. Stayman, Johns Hopkins Univ. (United States)

12466-32 • 11:30 AM - 11:50 AM | Pacific C
Navigated surgical resection cavity inspection for breast-conserving surgery
Author(s): Olivia Radcliffe, Laura Connolly, Tamas Ungi, Queen's Univ. (Canada); Caitlin Yeo, University of Calgary (Canada); John F. Rudan, Gabor Fichtinger, Parvin Mousavi, Queen's Univ. (Canada)

Lunch Break 11:50 AM - 1:20 PM

SESSION 8: IMAGE-GUIDED NEUROSURGERY

22 February 2023 • 1:20 PM - 3:00 PM | Pacific C
Session Chairs: Kristy K. Brock, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Jack H. Noble, Vanderbilt Univ. (United States)

12466-33 • 1:20 PM - 1:40 PM | Pacific C
Automatic, deep-learning-based segmentation of the amygdalohippocampectomy resection cavity in MR images
Author(s): Dingjie Su, Vanderbilt Univ. (United States); Danika L. Paulo, Tyler Ball, Vanderbilt Univ. Medical Ctr. (United States); Victoria L. Morgan, Vanderbilt Univ. Institute of Imaging Science (United States); Dario J. Englot, Vanderbilt Univ. Medical Ctr. (United States); Benoit M. Dawant, Vanderbilt Univ. (United States)

12466-34 • 1:40 PM - 2:00 PM | Pacific C
Attention based multi-instance learning for improved glioblastoma detection using mass spectrometry
Author(s): Dilakshan Srikanthan, Martin Kaufmann, Amoon Jamzad, Gabor Fichtinger, James Purzner, Teresa Purzner, John F. Rudan, Parvin Mousavi, Alice Santilli, Alireza Sedghi, Ayesha Syeda, Queen's Univ. (Canada)

12466-35 • 2:00 PM - 2:20 PM | Pacific C
Comparison of neural activation models to analyze the impact of brain deformations on neural pathways during DBS procedures
Author(s): Kyvia Pereira, Michael I. Miga, Ma Luo, Vanderbilt Univ. (United States)

12466-36 • 2:20 PM - 2:40 PM | Pacific C
SIFT-based cortical surface shift estimation for intraoperative image updating
Author(s): Xiaoyao Fan, Kristen L. Chen, William R. Warner, Ryan B. Duke, Chen Li, Thayer School of Engineering at Dartmouth (United States); Linton T. Evans, Dartmouth-Hitchcock Medical Ctr. (United States); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (United States)

12466-37 • 2:40 PM - 3:00 PM | Pacific C
Accounting for brain shift during image-guided tumor resection surgeries: an intraoperative feasibility study
Author(s): Michael I. Miga, Ma Luo, Jaime Tierney, Winona L. Richey, Jon S. Heiselman, Vanderbilt Univ. (United States); Reid C. Thompson, Vanderbilt Univ. Medical Ctr. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 9: ULTRASOUND + IMAGE-GUIDED PROCEDURES

Joint Session with Conferences 12466 and 12470
NOTE ROOM CHANGE

22 February 2023 • 3:30 PM - 5:10 PM | Town & Country D
Session Chairs: Mohammad Mehrmohammadi, Univ. of Rochester (United States), Elvis C.S. Chen, Robarts Research Institute (Canada)

12466-38 • 3:30 PM - 3:50 PM | Town & Country D
Computational Modeling Towards Focused Ultrasound Therapy for Spinal Cord Injury: Visualization of Beam Propagation through Patient-Specific Anatomy
Author(s): Avisha Kumar, Max J. Kerensky, Eduardo Gonzalez, Muyinatu Bell, Nicholas Theodore, Nitish Thakor, Amir Manbachi, Johns Hopkins Univ. (United States)

CONFERENCE 12466

12470-11 • 3:50 PM - 4:10 PM | Town & Country D

3D ultrasound to investigate synovial blood flow in 1st carpometacarpal osteoarthritis

Author(s): Megan Hutter, Randa Mudathir, Robarts Research Institute (Canada), Western Univ. (Canada); Carla du Toit, Robarts Research Institute (Canada); Robert Dima, Western Univ. (Canada); Lori Gardi, Robarts Research Institute (Canada); Nina Suh, Emory Univ. (United States); Emily A. Lalone, Western Univ. (Canada); Aaron Fenster, Robarts Research Institute (Canada), Western Univ. (Canada)

12470-12 • 4:10 PM - 4:30 PM | Town & Country D

Three-dimensional ultrasound for quantitation of synovial tissue volume in knee osteoarthritis

Author(s): Robert Dima, Carla du Toit, Jennifer Polus, Trevor Birmingham, C. Thomas Appleton, Aaron Fenster, Western Univ. (Canada)

12466-39 • 4:30 PM - 4:50 PM | Town & Country D

An open-source 3D Slicer module for fluoro-free transcatheter vessel navigation

Author(s): Hareem Nisar, Patrick Carnahan, Western Univ. (Canada); Daniel Bainbridge, London Health Sciences Ctr. (Canada); Elvis C. S. Chen, Terry M. Peters, Western Univ. (Canada)

12466-40 • 4:50 PM - 5:10 PM | Town & Country D

Point-of-care ultrasound carotid artery volume reconstruction using deep-learning

Author(s): Michellie Choi, Shuwei Xing, Terry M. Peters, Elvis C. S. Chen, Robarts Research Institute (Canada)

POSTERS-WEDNESDAY

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12466-55

Cadaveric study of a novel pneumatic biopsy drill for long bone biopsies

Author(s): Elizabeth Fischer, Mikias Gebremeskel, Karun Sharma, Children's National Hospital (United States); Dan Stoianovici, Johns Hopkins Medicine (United States); Kevin Cleary, Children's National Hospital (United States)

12466-56

Image-guided radial-probe EBUS bronchoscopy system: live study validation

Author(s): William E. Higgins, Wennan Zhao, Trevor Kuhlengel, Qi Chang, Vahid Daneshpajooh, The Pennsylvania State Univ. (United States); Thomas Schaer, Leslie Brewer, Univ. of Pennsylvania (United States); Danish Ahmad, The Pennsylvania State Univ. (United States); Jennifer Toth, The Pennsylvania State Univ. (United States); Rebecca Bascom, The Pennsylvania State Univ. (United States)

12466-57

Feasibility of a novel CT grid template for needle-based targeting in phantom

Author(s): Elizabeth Fischer, Pavan Pavan Mantripragada, Andrew Keisey Espinoza, Pavel Yarmolenko, Kevin Cleary, Karun Sharma, Reza Monfaredi, Children's National Hospital (United States)

12466-59

Volumetric versus distortional deformation in rat lungs

Author(s): Sunder Neelakantan, Texas A&M Univ. (United States); Mostafa K. Ismail, Univ. of Pennsylvania (United States); Tanmay Mukherjee, Texas A&M Univ. (United States); Bradford J. Smith, Univ. of Colorado Denver School of Medicine (United States); Rahim R. Rizi, Univ. of Pennsylvania (United States); Reza Avazmohammadi, Texas A&M Univ. (United States)

12466-60

Augmented reality guidance platform for epicardial access: a phantom study

Author(s): Kobe Bamps, Jeroen Bertels, Lennert Minten, Alexis Puvrez, Walter Coudyzer, Stijn De Buck, Joris Ector, KU Leuven (Belgium)

12466-61

An advanced augmented reality user interface system for use in prostate biopsies

Author(s): Patric Bettati, Baowei Fei, The Univ. of Texas at Dallas (United States)

12466-62

Multi-organ CT Segmentation Using Shifted-window Multilayer Perceptron Mixer

Author(s): Shaoyan Pan, Jacob Wynne, Mingzhe Hu, Emory Univ. (United States); Tonghe Wang, Memorial Sloan-Kettering Cancer Ctr. (United States); Justin Roper, Pretesh Patel, Tian Liu, Xiaofeng Yang, Emory Univ. (United States)

12466-63

Image based registration between full X-ray and spot mammograms: Analysis of registration accuracy in subgroups

Author(s): Sarah Said, Karlsruher Institut für Technologie (Germany); Paola Clauser, Medizinische Univ. Wien (Austria); Nicole Ruiter, Karlsruher Institut für Technologie (Germany); Pascal Baltzer, Medizinische Univ. Wien (Austria); Torsten Hopp, Karlsruher Institut für Technologie (Germany)

12466-65

Deformable image registration of chest CT using deep cycle network

Author(s): Luke Matkovic, Yang Lei, Yabo Fu, Tonghe Wang, Aparna Kesarwala, Marian Axente, Justin Roper, Kristin Higgins, Jeffrey D. Bradley, Tian Liu, Xiaofeng Yang, The Winship Cancer Institute of Emory Univ. (United States)

12466-66

Lung nodule false positive reduction using a central attention convolutional neural network on imbalanced data

Author(s): Kexin Hao, Annan Cai, XingYu Feng, Ling Ma, Jingwen Zhu, Nankai Univ. (China); Murong Wang, PVmed Medical Technologies Co., Ltd. (China); Yun Zhang, Sun Yat-Sen Univ. Cancer Ctr. (China); Baowei Fei, The Univ. of Texas at Dallas (United States)

12466-67

Analyzing colonoscopy training learning curves using comparative hand tracking assessment

Author(s): Keiran Barr, Lab. for Percutaneous Surgery, Queen's Univ. (Canada); Lawrence Hookey, Tamas Ungi, Queen's Univ. (Canada); Gabor Fichtinger, Lab. for Percutaneous Surgery, Queen's Univ. (Canada); Matthew Holden, Carleton Univ. (Canada)

12466-68

Computer vision-based bronchoscope tracking and navigation tool

Author(s): Ming Li, National Institutes of Health (United States); Nicole Varble, National Institutes of Health Clinical Ctr. (United States), Philips Research North America (United States); John Karanian, National Institutes of Health (United States); Pingkun Yan, Rensselaer Polytechnic Institute (United States); Sheng Xu, National Institutes of Health (United States); Bradford Wood, National Institutes of Health Clinical Ctr. (United States)

12466-69

Identifying tool-tissue interactions to distinguish steps in simulated open inguinal hernia repair

Author(s): Elizabeth H. Klosa, Rebecca J. Hisey, Kian Hashtrudi-Zaad, Boris Zevin, Tamas Ungi, Gabor Fichtinger, Queen's Univ. (Canada)

12466-70

ViPRE: An open-source software implementation for end-to-end analysis of mass spectrometry data

Author(s): Hanad Elmi, Amoon Jamzad, Mackenzie Sharp, Jessica R. Rodgers, Martin Kaufmann, Tamara Jamaspishvili, Rachael Iseman, David Berman, John Rudan, Gabor Fichtinger, Parvin Mousavi, Queen's Univ. (Canada)

12466-71

Cautery trajectory analysis for evaluation of resection margins in breast-conserving surgery

Author(s): Chris Yeung, Joshua Ehrlich, Amoon Jamzad, Queen's Univ. (Canada); Martin Kaufmann, John F. Rudan, Jay Engel, Kingston Health Sciences Ctr. (Canada); Parvin Mousavi, Tamas Ungi, Gabor Fichtinger, Queen's Univ. (Canada)

12466-72

Deep learning based rectum segmentation on low-field prostate MRI to assist image-guided biopsy

Author(s): Huong Pham, The Univ. of Oklahoma (United States); Dang Bich Thuy Le, Meredith Sadinski, Ram Narayanan, Aleksandar Nacev, Promaxo, Inc. (United States); Bin Zheng, The Univ. of Oklahoma (United States)

12466-73

Surgical area recognition from laparoscopic images in laparoscopic gastrectomy for gastric cancer using label smoothing and uncertainty

Author(s): Yuichiro Hayashi, Nagoya Univ. (Japan); Kazunari Misawa, Aichi Cancer Ctr. Research Institute (Japan); Kensaku Mori, Nagoya Univ. (Japan)

12466-74

Feasibility of MRI-US registration in oropharynx for transoral robotic surgery

Author(s): Wanwen Chen, Qi Zeng, Thomas D. Milner, Razeyeh Bagherinasab, Farahna Sabiq, Eitan Prisman, Emily H. T. Pang, Septimiu E. Salcudean, The Univ. of British Columbia (Canada)

12466-75

Auto-segmentation of thoracic brachial plexuses for radiation therapy planning

Author(s): Ademola E. Ilesanmi, Penn Medicine (United States); Jayaram K. Udupa, Liming Zhao, Yubing Tong, Univ. of Pennsylvania (United States); Tiange Liu, Yanshan Univ. (China); Dewey Odhner, Univ. of Pennsylvania (United States); Gargi Pednekar, Sanghita Nag, Sharon Lewis, Joe Camaratta, Steve Owens, Quantitative Radiology Solutions (United States); Drew A. Torigian, Univ. of Pennsylvania (United States)

12466-77

Atlas-based automatic internal auditory canal localization with a weakly-supervised 3D U-Net

Author(s): Hannah G. Mason, Jack H. Noble, Vanderbilt Univ. (United States)

12466-78

Modeling retraction for breast conserving surgery guidance

Author(s): Amairanny Espinosa, Vanderbilt Institute for Surgery and Engineering (United States); Morgan J. Ringel, Vanderbilt Univ. (United States); Jon S. Heiselman, Memorial Sloan-Kettering Cancer Ctr. (United States); Kyvia Pereira, Frankangel Servin, Winona L. Richey, Vanderbilt Univ. (United States); Ingrid Meszoely, Vanderbilt Univ. Medical Ctr. (United States); Michael I. Miga, Vanderbilt Univ. (United States)

12466-79

Stereovision registration using a tracked checkerboard calibration object for a breast surgery image guidance system

Author(s): Alexander W. Stabile, Morgan J. Ringel, Winona L. Richey, Jon S. Heiselman, Ingrid Meszoely, Michael I. Miga, Vanderbilt Univ. (United States)

12466-80

Influence of auditory nerve fiber model parameters on electrical stimulus thresholds

Author(s): Erin L. Bratu, Ziteng Liu, Jack H. Noble, Vanderbilt Univ. (United States)

12466-81

Development of a mixed reality application to simulate neurosurgical procedures

Author(s): Kush Hari, Vanderbilt Univ. (United States); Reid C. Thompson, Lola B. Chambless, Vanderbilt Univ. Medical Ctr. (United States); Michael I. Miga, Vanderbilt Univ. (United States)

12466-82

Optimal delivery of vagus nerve stimulation

Author(s): Kyvia Pereira, Ma Luo, Michael I. Miga, Vanderbilt Univ. (United States)

12466-83

Registration of 2D monocular endoscopy to 3D CBCT for video-assisted thoracoscopic surgery

Author(s): Baptiste Noblet, Matthieu Chabanas, Univ. Grenoble Alpes (France); Simon Rouzé, CHU Rennes (France); Sandrine Voros, Univ. Grenoble Alpes (France)

CONFERENCE 12466

12466-84

Towards a learning-based CT segmentation of acetabular fractures

Author(s): Andy Zhang, Univ. Grenoble Alpes (France); Mehdi Boudissa, Ctr. Hospitalier Univ. Grenoble Alpes (France); Maxime Nemo, Univ. Grenoble Alpes (France); Jérôme Tonetti, Ctr. Hospitalier Univ. Grenoble Alpes (France); Matthieu Chabanas, Univ. Grenoble Alpes (France)

12466-85

A virtual reality framework for evaluating concentric tube surgical robot designs

Author(s): Jason Shrand, Vanderbilt Univ. (United States); Jesse F. d'Almeida, Tayfun E. Ertop, Department of Mechanical Engineering, Vanderbilt University (United States); Nicholas Kavoussi, S. Duke Herrell, Department of Urologic Surgery, Vanderbilt University Medical Center (United States); Robert Webster, Department of Mechanical Engineering, Vanderbilt University (United States)

12466-86

Assessment of cardiac gating in the treatment of cardiac arrhythmias using external beam ablation

Author(s): Maryam E. Rettmann, Amanda Deisher, Tatsuhiko Hirao, Naoto Otsuka, Stephan Hohmann, Hiroki Konishi, Kimitake Imamura, Alexa Miller, Jon Kruse, Kenneth Merrell, Douglas Packer, Mayo Clinic (United States)

12466-87

Development of a biomechanical monitoring system for flexible ureteroscopy

Author(s): Laura Torre, Nicholas Hugenberg, Jayson Kemble, Kevin Koo, Christopher Felton, Clifton Haider, David R. Holmes, Mayo Clinic (United States)

12466-88

Initial image-plane assessment of kinematic-based stereo overlay in trans-oral robotic surgery

Author(s): Michael A. Kokko, Yuan Shi, Thayer School of Engineering at Dartmouth (United States); Joseph A. Paydarfar, Thayer School of Engineering at Dartmouth (United States), Dartmouth-Hitchcock Medical Ctr. (United States); Ryan J. Halter, Thayer School of Engineering at Dartmouth (United States)

12466-89

Automated localization of mini-screw fiducials in spine CT scans

Author(s): Ryan B. Duke, Xiaoyao Fan, William R. Warner, Thayer School of Engineering at Dartmouth (United States); Steven Baltic, Dartmouth-Hitchcock Medical Ctr. (United States); Kristen L. Chen, Thayer School of Engineering at Dartmouth (United States); Linton T. Evans, Dartmouth-Hitchcock Medical Ctr. (United States); Songbai Ji, Worcester Polytechnic Institute (United States); Sohail K. Mirza, Thayer School of Engineering at Dartmouth (United States), Dartmouth-Hitchcock Medical Ctr. (United States); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (United States), Dartmouth-Hitchcock Medical Ctr. (United States), Geisel School of Medicine (United States)

12466-90

Hyperspectral imaging and detection mapping of In vivo biological tissues applying near-infrared laparoscope

Author(s): Ryodai Fukushima, Tokyo Univ. of Science (Japan); Toshihiro Takamatsu, National Cancer Ctr. (Japan); Akino Mori, Kounosuke Sato, Kyohei Okubo, Masakazu Umezawa, Tokyo Univ. of Science (Japan); Nobuyoshi Takeshita, Hiro Hasegawa, National Cancer Ctr. Hospital East (Japan); Hideo Yokota, RIKEN Ctr. for Advanced Photonics (Japan); Kohei Soga, Hiroshi Takemura, Tokyo Univ. of Science (Japan)

12466-93

Estimating shift at deep brain targets in deep brain stimulation: a comparison between a machine learning approach and a biomechanical model

Author(s): Kristen L. Chen, Chen Li, Thayer School of Engineering at Dartmouth (United States); Joshua P. Aronson, Geisel School of Medicine (United States), Dartmouth Hitchcock Medical Ctr. (United States); Xiaoyao Fan, Thayer School of Engineering at Dartmouth (United States); Keith D. Paulsen, Thayer School of Engineering at Dartmouth (United States), Geisel School of Medicine (United States), Norris Cotton Cancer Ctr. (United States)

THURSDAY 23 FEBRUARY

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A
Seeing and feeling in robot-assisted surgery
(Keynote Presentation)
Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A
Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)
Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: DIGITAL AND PHYSICAL MODELS

23 February 2023 • 10:30 AM - 11:50 AM | Pacific C
Session Chairs: Tamas Ungi, Queen's Univ. (Canada), Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States)

12466-41 • 10:30 AM - 10:50 AM | Pacific
Digital twin forecasting of microwave ablation via fat quantification image-to-grid computational methods
Author(s): Frankangel Servin, Vanderbilt Univ. (United States); Jarrod A. Collins, Inari Medical, Inc. (United States); Jon S. Heiselman, Vanderbilt Univ. (United States); Katherine Frederick-Dyer, Virginia Planz, Vanderbilt Univ. (United States); Daniel B. Brown, Vanderbilt Univ. Medical Ctr. (United States); Sunil K. Geevarghese, Michael I. Miga, Vanderbilt Univ. (United States)

12466-42 • 10:50 AM - 11:10 AM | Pacific C
Towards virtual displays in the interventional radiology suite: a feasibility study
Author(s): Daniel R. Allen, Western Univ. (Canada); Nadia Cattari, Univ. di Pisa (Italy); Joeana N. Cambranis Romero, Elvis C. S. Chen, Terry M. Peters, Western Univ. (Canada)

12466-43 • 11:10 AM - 11:30 AM | Pacific C

Toward three-dimensional (3D) human biomimetic models for x-ray radiation dosimetry and biomedical image analysis

Author(s): Terry Yoo, Nimesha Ranasinghe, Avery Gosselin, The Univ. of Maine (United States)

12466-44 • 11:30 AM - 11:50 AM | Pacific C

Developing and evaluating the fidelity of patient specific kidney emulating phantoms for image-guided intervention applications

Author(s): Kelly Merrell, Peter Jackson, Richard Simon, Cristian Linte, Rochester Institute of Technology (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 11: IMAGE-GUIDED AND ROBOT-ASSISTED SURGERY

23 February 2023 • 1:20 PM - 3:00 PM | Pacific C

Session Chair: Ziv R. Yaniv, National Institute of Allergy and Infectious Diseases (United States)

12466-45 • 1:20 PM - 1:40 PM | Pacific C

Determining the time-delay of a mass spectrometry-based tissue sensor

Author(s): Joshua Ehrlich, Queen's Univ. (Canada); Chris Yeung, Queen's Univ. (Canada); Martin Kaufmann, Kingston Health Sciences Ctr. (Canada); Amoon Jamzad, John F. Rudan, Parvin Mousavi, Gabor Fichtinger, Tamas Ungi, Queen's Univ. (Canada)

12466-46 • 1:40 PM - 2:00 PM | Pacific C

Design considerations for robotic, MRI-guided, trans-foramen ovale access to the brain

Author(s): Abby M. Grillo, John E. Peters, Daniel S. Esser, Sarah J. Garrow, Vanderbilt Univ. (United States); Tyler Ball, Robert Naftel, Dario J. Englot, Vanderbilt Univ. Medical Ctr. (United States); Joseph Neimat, Univ. of Louisville (United States); William A. Grissom, Eric J. Barth, Robert J. Webster, Vanderbilt Univ. (United States)

12466-47 • 2:00 PM - 2:20 PM | Pacific C

Multi-body 3D-2D registration for robot-assisted joint reduction: preclinical evaluation in the ankle syndesmosis

Author(s): Rohan C. Vijayan, Krishnan Venkataraman, Jinchi Wei, Niral M. Sheth, Johns Hopkins Univ. (United States); Babar Shafiq, The Johns Hopkins Univ. School of Medicine (United States); Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Wojciech Zbijewski, Johns Hopkins Univ. (United States); Gang Li, Kevin Cleary, Children's National Hospital (United States); Ali Uneri, Johns Hopkins Univ. (United States)

12466-48 • 2:20 PM - 2:40 PM | Pacific C

Multi-modality registration of preoperative MR and intraoperative long-length tomosynthesis using GAN synthesis and 3D-2D registration

Author(s): Yixuan Huang, Xiaoxuan Zhang, Ashley Johnston, Craig K. Jones, Johns Hopkins Univ. (United States); Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Wojciech Zbijewski, Johns Hopkins Univ. (United States); Patrick A. Helm, Medtronic, Inc. (United States); Brendan Judy, Amanda Sacino, Ali Bydon, Timothy F. Witham, Ali Uneri, The Johns Hopkins Univ. School of Medicine (United States)

12466-49 • 2:40 PM - 3:00 PM | Pacific C

Towards accounting for intraoperative spine motion: a simulation study of registration between stereovision surfaces

Author(s): William R. Warner, Xiaoyao Fan, Ryan B. Duke, Kristen L. Chen, Haley E. Stoner, Chen Li, Thayer School of Engineering at Dartmouth (United States); Shaoju Wu, Songbai Ji, Worcester Polytechnic Institute (United States); Sohail K. Mirza, Keith D. Paulsen, Thayer School of Engineering at Dartmouth (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 12: SURGICAL NAVIGATION

23 February 2023 • 3:30 PM - 5:10 PM | Pacific C

Session Chairs: Tamas Ungi, Queen's Univ. (Canada), Elvis C.S. Chen, Robarts Research Institute (Canada)

12466-50 • 3:30 PM - 3:50 PM | Pacific C

Temporal bone CT synthesis for MR-only cochlear implant preoperative planning

Author(s): Yubo Fan, Mohammad M. R. Khan, Han Liu, Jack H. Noble, Vanderbilt Univ. (United States); Robert F. Labadie, Medical Univ. of South Carolina (United States); Benoit M. Dawant, Vanderbilt Univ. (United States)

12466-51 • 3:50 PM - 4:10 PM | Pacific C

The effect of luminance on depth perception in augmented reality guided laparoscopic surgery

Author(s): Athena Reissis, Soojeong Yoo, Matthew J. Clarkson, Steve A. Thompson, Univ. College London (United Kingdom)

12466-52 • 4:10 PM - 4:30 PM | Pacific C

Tracked tissue sensing for tumor bed inspection

Author(s): David Morton, Laura Connolly, Leah Groves, Kyle Sunderland, Amoon Jamzad, John F. Rudan, Gabor Fichtinger, Tamas Ungi, Parvin Mousavi, Queen's Univ. (Canada)

12466-53 • 4:30 PM - 4:50 PM | Pacific C

Determining boundaries of accurate tracking for electromagnetic sensors

Author(s): Pavel-Dumitru Cernelev, Queen's Univ. (Canada); Kristof Moga, Semmelweis Univ. (Hungary); Leah Groves, Queen's Univ. (Canada); Tamás Haidegger, Óbuda Univ. (Hungary); Gabor Fichtinger, Tamas Ungi, Queen's Univ. (Canada)

12466-54 • 4:50 PM - 5:10 PM | Pacific C

Bluetooth-based wireless electromagnetic tracking platform For image-guided applications

Author(s): Charu Pande, Tyndall National Institute, Univ. College Cork (Ireland); Padraig Cantillon-Murphy, Tyndall National Institute (Ireland); Craig K. Abbey

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DIGITAL POSTERS

19 February 2023 • 8:00 AM - 8:00 AM | On Demand

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12466-64

Dynamic attention deconvolutional single shot detector for polyp detection and classification in narrow-band imaging

Author(s): Guanping Xu, Yu Wu, Bei Li, Dongfang Shen, Ming Wu, Ao Wang, Wenkang Fan, Xiamen Univ. (China); Hong Shi, JianHua Chen, Fujian Medical Univ. (China); Yinran Chen, Xiongbiao Luo, Xiamen Univ. (China)

CONFERENCE 12467

Image Perception, Observer Performance, and Technology Assessment

21 - 23 February 2023 | Palm 5/6

Conference Chair: **Claudia R. Mello-Thoms,** Univ. Iowa Carver College of Medicine (United States); **Yan Chen,** The Univ. of Nottingham (United Kingdom)

Program Committee: **Craig K. Abbey,** Univ. of California, Santa Barbara (United States); **Mark A. Anastasio,** Washington Univ. in St. Louis (United States); **Susan M. Astley,** The Univ. of Manchester (United Kingdom); **Jongduk Baek,**Yonsei Univ. (Korea, Republic of) Yonsei Univ. (Korea, Republic of); **François O. Bochud,**Ctr. Hospitalier Univ. Vaudois (Switzerland); **Jovan G. Brankov,** Illinois Institute of Technology (United States); **Brandon D. Gallas,** U.S. Food and Drug Administration (United States); **Howard C. Gifford,** Univ. of Houston (United States); **Stephen L. Hillis,** The Univ. of Iowa (United States); **Elizabeth A. Krupinski,** Emory Univ. School of Medicine (United States); **Matthew A. Kupinski,** College of Optical Sciences, The Univ. of Arizona (United States); **Sarah J. Lewis,** The Univ. of Sydney (Australia); **Mark F. McEntee,** Univ. College Cork (Ireland); **Robert M. Nishikawa,** Univ. of Pittsburgh (United States); **Ljiljana Platiša,** Univ. Gent (Belgium); **Ingrid S. Reiser,** The Univ. of Chicago (United States); **Frank W. Samuelson,** U.S. Food and Drug Administration (United States); **Sian Taylor-Phillips,** The Univ. of Warwick (United Kingdom); **Pontus A. Timberg,** Scanias Univ. Hospital (Sweden)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A
ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)
Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A
Human-AI collaboration *(Keynote Presentation)*
Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: VISUAL SEARCH

21 February 2023 • 10:30 AM - 11:50 AM | Palm 5/6
Session Chairs: Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States), Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

12467-1 • 10:30 AM - 10:50 AM | Palm 5/6
Comparing experts to novices: Reduced satisfaction of search when searching with virtual breast tomosynthesis
Author(s): Stephen Adamo, Univ. of Central Florida (United States); Bruno Barufaldi, Univ. of Pennsylvania (United States); Miguel A. Lago, U.S. Food and Drug Administration (United States)

12467-2 • 10:50 AM - 11:10 AM | Palm 5/6
A training program to reduce reader search errors for liver metastasis detection in CT
Author(s): Scott S. Hsieh, Akitoshi Inoue, Mariana Yalon, David A. Cook, Jeff L. Fidler, Hao Gong, Parvathy Sudhir Pillai, Andrew J. Vercnocke, Matthew P. Johnson, Shuai Leng, Lifeng Yu, David R. Holmes, Rickey E. Carter, Cynthia H. McCollough, Joel G. Fletcher, Mayo Clinic (United States)

12467-3 • 11:10 AM - 11:30 AM | Palm 5/6
Optimal visual search strategy with inter-saccade response correlations
Author(s): Weimin Zhou, Shanghai Jiao Tong Univ. (China); Miguel P. Eckstein, Univ. of California, Santa Barbara (United States)

12467-4 • 11:30 AM - 11:50 AM | Palm 5/6
Challenges and solutions to processing and visualizing eye tracking data from digital pathology studies
Author(s): George Partridge, The Univ. of Nottingham (United Kingdom); Peter Phillips, Univ. of Cumbria (United Kingdom); Adnan Taib, Yan Chen, The Univ. of Nottingham (United Kingdom)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: BREAST

21 February 2023 • 1:20 PM - 3:00 PM | Palm 5/6
Session Chairs: Susan M. Astley, The Univ. of Manchester (United Kingdom), Sarah J. Lewis, The Univ. of Sydney (Australia)

12467-5 • 1:20 PM - 1:40 PM | Palm 5/6
Identifying and preventing fatigue in digital breast tomosynthesis.
Author(s): Adnan Taib, George Partridge, Iain Darker, The Univ. of Nottingham (United Kingdom); Peter Phillips, Univ. of Cumbria (United Kingdom); Yan Chen, The Univ. of Nottingham (United Kingdom)

12467-6 • 1:40 PM - 2:00 PM | Palm 5/6
Global mammographic radiomic signature can predict radiologists' difficult-to-interpret normal cases
Author(s): Somphone Siviengphanom, Ziba Gandomkar, Sarah J. Lewis, Patrick C. Brennan, The Univ. of Sydney (Australia)

12467-7 • 2:00 PM - 2:20 PM | Palm 5/6

A comparative study of diagnostic performance and work experience of radiologists in three countries interpreting digital breast tomosynthesis

Author(s): Elly K. Gallagher, Phuong D. Trieu, Ziba Gandomkar, Tong Li, Masoumeh Gity, Patrick C. Brennan, Sarah J. Lewis, Seyedamir Tavakoli Taba, The Univ. of Sydney (Australia)

12467-8 • 2:20 PM - 2:40 PM | Palm 5/6

False-negative diagnosis might occur due to absence of the global radiomic signature of malignancy on screening mammograms

Author(s): Ziba Gandomkar, Sarah J. Lewis, Somphone Siviengphanom, Dennis Wong, Ernest Ekpo, Moayyad E. Suleiman, Xuetong Tao, Warren Reed, Patrick C. Brennan, The Univ. of Sydney (Australia)

12467-9 • 2:40 PM - 3:00 PM | Palm 5/6

Investigating the error-making patterns in reading high-density screening mammograms between radiologists from two countries

Author(s): Xuetong Tao, Ziba Gandomkar, Tong Li, Warren Reed, Patrick C. Brennan, The Univ. of Sydney (Australia)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: AI

Joint Session with Conferences 12465 and 12467
NOTE ROOM CHANGE

21 February 2023 • 3:30 PM - 5:30 PM | Town & Country C

Session Chairs: Weijie Chen, U.S. Food and Drug Administration (United States), Yan Chen, The Univ. of Nottingham (United Kingdom)

12467-10 • 3:30 PM - 3:50 PM | Town & Country C

Longitudinal robustness of a thoracic radiographic AI model for COVID-19 severity prediction

Author(s): Karen Drukker, Hui Li, Maryellen L. Giger, The Univ. of Chicago (United States)

12465-25 • 3:50 PM - 4:10 PM | Town & Country C

Assessing an AI-based smart imagery framing and truthing (SIFT) system to assist radiologists annotating lung abnormalities on chest x-ray images for development of deep learning models

Author(s): Lin Guo, Kunlei Hong, Shenzhen Zhiying Medical Imaging (China); Ziqi Zhang, Tsinghua-Berkeley Shenzhen Institute, Tsinghua University (China); Bin Zheng, The Univ. of Oklahoma (United States); Stefan Jaeger, U.S. National Library of Medicine, National Institutes of Health (United States); Jordan Fuhrman, Hui Li, Maryellen L. Giger, The Univ. of Chicago (United States); Andrei Gabrielian, Alex Rosenthal, Darrell E. Hurt, Ziv Yaniv, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Y.M. Fleming Lure, MS Technologies Corp. (United States)

12467-11 • 4:10 PM - 4:30 PM | Town & Country C

Developing and assessing an AI-based multi-task prediction system to assist radiologists detecting lung diseases in reading chest X-ray images

Author(s): Lin Guo, Kunlei Hong, Qian Xiao, Lingjun Qian, Shenzhen Zhiying Medical Imaging (China); Stefan Jaeger, U.S. National Library of Medicine (United States); Bin Zheng, The Univ. of Oklahoma (United States); Shenwen Quan, Li Xia, Shenzhen Zhiying Medical Imaging (China); Guanxun Cheng, Department of Radiology, Peking University Shenzhen Hospital (China); Y. M. Fleming Lure, MS Technologies Corp. (United States)

12465-26 • 4:30 PM - 4:50 PM | Town & Country C

How does image quality affect computer-aided diagnosis of colorectal polyps?

Author(s): Thom Scheeve, Nikoo Dehghani, Technische Univ. Eindhoven (Netherlands); Quirine E. W. van der Zander, Ayla Thijssen, Maastricht Univ. (Netherlands); Ramon-Michel Schreuder, Catharina Hospital (Netherlands); Ad A. M. Masclee, Maastricht Univ. Medical Ctr. (Netherlands); Erik J. Schoon, Catharina Hospital (Netherlands); Fons van der Sommen, Peter H. N. de With, Technische Univ. Eindhoven (Netherlands)

12467-12 • 4:50 PM - 5:10 PM | Town & Country C

Assistance tools for the evaluation of machine learning algorithm performance: the decision tree based tools developed by the Medical Imaging and Data Resource Center (MIDRC) Technology Development Project (TDP) 3c effort

Author(s): Karen Drukker, The Univ. of Chicago (United States); Berkman Sahiner, Tingting Hu, U.S. Food and Drug Administration (United States); Grace H. Kim, David Geffen School of Medicine, Univ. of California, Los Angeles (United States); Heather M. Whitney, Natalie Baughan, The Univ. of Chicago (United States); Kyle J. Myers, Puente Solutions, LLC (United States); Maryellen L. Giger, The Univ. of Chicago (United States); Michael F. McNitt-Gray, David Geffen School of Medicine, Univ. of California, Los Angeles (United States)

12465-27 • 5:10 PM - 5:30 PM | Town & Country C

Automated right coronary artery localizer using deep learning for optimal cardiac phase selection

Author(s): Chih-Chieh Liu, Qiulin Tang, Liang Cai, Zhou Yu, Jian Zhou, Canon Medical Research USA, Inc. (United States)

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

CONFERENCE 12467

Live Demonstrations Workshop
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Deep Learning in Medical Image Formation: Current Status and Future Directions
21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES
22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A

Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:40 AM

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22 February 2023 • 10:30 AM - 11:50 AM | Palm 5/6
Session Chairs: Craig K. Abbey, Univ. of California, Santa Barbara (United States), Stephen L. Hillis, The Univ. of Iowa (United States)

12467-13 • 10:30 AM - 10:50 AM | Palm 5/6
Obuchowski-Rockette analysis for multi-reader multi-test (MRMC) readers-nested-in-test study designs with unequal numbers of readers or cases
Author(s): Stephen L. Hillis, The Univ. of Iowa (United States)

12467-14 • 10:50 AM - 11:10 AM | Palm 5/6
Approximating the idea observer on list mode data with comparison to CNN methods
Author(s): Dan Li, Eric W. Clarkson, The Univ. of Arizona (United States)

12467-15 • 11:10 AM - 11:30 AM | Palm 5/6
Predictive accuracy of model observers in lesion discrimination tasks
Author(s): Craig K. Abbey, Univ. of California, Santa Barbara (United States); Frank W. Samuelson, Rongping Zeng, U.S. Food and Drug Administration (United States); John M. Boone, UC Davis Medical Ctr. (United States); Miguel P. Eckstein, Univ. of California, Santa Barbara (United States); Kyle J. Myers, Puente Solutions, LLC (United States)

12467-16 • 11:30 AM - 11:50 AM | Palm 5/6
Estimating task-based performance bounds for image reconstruction methods by use of learned-Ideal Observers
Author(s): Kaiyan Li, Univ. of Illinois (United States); Weimin Zhou, Shanghai Jiao Tong Univ. (United States); Hua Li, Washington Univ. in St. Louis (United States); Mark A. Anastasio, Univ. of Illinois (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 5: ARTIFICIAL INTELLIGENCE I
22 February 2023 • 1:20 PM - 3:00 PM | Palm 5/6
Session Chairs: Mark F. McEntee, Univ. College Cork (Ireland), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

12467-17 • 1:20 PM - 1:40 PM | Palm 5/6
Convolutional neural networks detect cells in densely packed images at performance levels similar to human readers
Author(s): Madeleine S. Durkee, Nevaeh Petrie, Kyle Lleras, Junting Ai, Rebecca Abraham, Fiona Clark, J. Cy Chittenden, Chasity Kasir, Gabriel Casella, Marcus R. Clark, Maryellen L. Giger, The Univ. of Chicago (United States)

12467-18 • 1:40 PM - 2:00 PM | Palm 5/6
Full-field digital mammogram retrieval using Fourier feature based auto-encoder: application in breast cancer screening training
Author(s): Luyan Yao, The Univ. of Nottingham (United Kingdom); Jiefei Wei, Loughborough Univ. (United Kingdom); Xin Chen, Yan Chen, The Univ. of Nottingham (United Kingdom)

12467-19 • 2:00 PM - 2:20 PM | Palm 5/6

Investigation of demographic implicit discrimination and disparate impact in chest radiography image-based AI for COVID-19 severity prediction

Author(s): Heather M. Whitney, Hui Li, Karen Drukker, Michael Reeve, Maryellen L. Giger, The Univ. of Chicago (United States)

12467-20 • 2:20 PM - 2:40 PM | Palm 5/6

How do you solve a problem like concordance? A study of radiologists' clinical annotations for mammographic AI training

Author(s): Zhengqiang Jiang, Phuong D. Trieu, Ziba Gandomkar, Seyedamir Tavakoli Taba, Melissa L. Barron, Sarah J. Lewis, The Univ. of Sydney (Australia)

12467-21 • 2:40 PM - 3:00 PM | Palm 5/6

Spatiotemporal image quality in medical extended reality

Author(s): Chumin Zhao, Ryan Beams, Aldo Badano, U.S. Food and Drug Administration (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 6: ARTIFICIAL INTELLIGENCE II

22 February 2023 • 3:30 PM - 5:30 PM | Palm 5/6

Session Chairs: Pontus A. Timberg, Scanias Univ. Hospital (Sweden), Frank W. Samuelson, U.S. Food and Drug Administration (United States)

12467-22 • 3:30 PM - 3:50 PM | Palm 5/6

An observer comparison study to evaluate a machine learning model to quantify the infected pneumonia on lung CT images

Author(s): Alireza Abdihamzehkolaei, Seyedehnafiseh Mirniaharikandehei, The Univ. of Oklahoma (United States); Angel Choquehuanca, Marco Aedo, Wilmer Pacheco, Laura Estacio, Victor Cahui, Luis Huallpa, Kevin Quiñonez, Valeria Calderón, Ana Maria Gutierrez, Ana Vargas, Dery Gamero, Eveling Castro-Gutierrez, Univ. Nacional de San Agustin de Arequipa (Peru); Yuchen Qiu, Bin Zheng, Javier A. Jo, The Univ. of Oklahoma (United States)

12467-23 • 3:50 PM - 4:10 PM | Palm 5/6

A user interface to communicate interpretable AI decisions to radiologists

Author(s): Yanchen Jessie Ou, Alina J. Barnett, Anika Mitra, Fides R. Schwartz, Duke Univ. (United States); Chaofan Chen, The Univ. of Maine (United States); Lars Grimm, Joseph Y. Lo, Cynthia Rudin, Duke Univ. (United States)

12467-24 • 4:10 PM - 4:30 PM | Palm 5/6

Analysis of a pilot study collecting pathologist annotations for validating machine learning algorithms

Author(s): Katherine N. Elfer, Victor Garcia, Brandon D. Gallas, U.S. Food and Drug Administration (United States)

12467-25 • 4:30 PM - 4:50 PM | Palm 5/6

Need for objective task-based evaluation of AI-based segmentation methods for quantitative PET

Author(s): Ziping Liu, Washington Univ. in St. Louis (United States); Joyce C. Mhlanga, Barry A. Siegel, Abhinav K. Jha, Washington Univ. School of Medicine in St. Louis (United States)

12467-26 • 4:50 PM - 5:10 PM | Palm 5/6

Observer study-based evaluation of TGAN architecture used to generate oncological PET images

Author(s): Roberto Fedrigo, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Fereshteh Yousefirizi, BC Cancer Research Institute (Canada); Ziping Liu, Abhinav K. Jha, Washington Univ. in St. Louis (United States), Washington Univ. School of Medicine in St. Louis (United States); Robert V. Bergen, Jean-Francois Rajotte, Raymond T. Ng, Data Science Institute, The Univ. of British Columbia (Canada); Ingrid Bloise, Sara Harsini, BC Cancer Research Institute (Canada); Dan J. Kadrmas, The Univ. of Utah (United States); Carlos Uribe, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada); Arman Rahmim, BC Cancer Research Institute (Canada), The Univ. of British Columbia (Canada), BC Cancer Agency (Canada)

12467-27 • 5:10 PM - 5:30 PM | Palm 5/6

A visibility overshoot index for interventional X-ray image quality assessment

Author(s): Asli Kumcu, Ljiljana Platisa, Bart Goossens, Univ. Gent (Belgium), imec (Belgium); Amber J. Gislason-Lee, Andrew G. Davies, Univ. of Leeds (United Kingdom); Gerard G. Schouten, Fontys Univ. of Applied Sciences (Netherlands), Philips Healthcare (Netherlands); Dimitri Buytaert, Klaus Bacher, Univ. Gent (Belgium)

POSTERS-WEDNESDAY

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12467-32

Configuring medical displays for high and stable image contrast in bright rooms

Author(s): Patrik Sund, Sahlgrenska Univ. Hospital (Sweden)

12467-33

Comparison of radiologists' interpretation efficiency on reading radiographs: standard 6 MP versus 12 MP high resolution display monitors

Author(s): Mostafa Abozeed, UAB Hospital (United States); Tom Kimpe, Barco N.V. (United States); Seth Lirette, Blackshear & Lirette, LLC (United States); Srini Tridandapani, The Univ. of Alabama at Birmingham (United States)

CONFERENCE 12467

12467-34

Comparative tests between actual and simulated digital mammography images for new computer schemes evaluation database

Author(s): Homero Schiabel, Fernanda J. F. Cardoso, Univ. de São Paulo (Brazil)

12467-35

Automatic assessment of skeletal maturity in Adolescent Idiopathic Scoliosis patients using support vector regression on deep features

Author(s): Hilary Cintia Djuikoua Wouafo, Luc Duong, Ecole de Technologie Supérieure (Canada); Julie Joncas, Marjolaine Roy-Beaudry, Soraya Barchi, Stefan Parent, Hubert Labelle, CHU Sainte-Justine (Canada)

12467-36

Evaluation of multiparametric MRI for deep learning-based segmentation of Wilms tumor

Author(s): Myrthe A. Buser, Alida F. W. van der Steeg, Marc H. W. A. Wijnen, Princess Máxima Ctr. for Pediatric Oncology B.V. (Netherlands); Bas H. M. van der Velden, Image Sciences Institut, Univ. Medical Ctr. Utrecht (Netherlands)

12467-39

Assessment of cerebral vascular abnormality quantification technique to aid aneurysm localization

Author(s): Giulia De Donno, Kimberley Timmins, Hugo Kuijf, Utrecht Univ. (Netherlands)

12467-40

Assessing the impact of correlated noise in digital mammography: a virtual clinical trial

Author(s): Lucas E. Soares, Renann Brandao, Lucas Borges, Univ. de São Paulo (Brazil); Bruno Barufaldi, Andrew Maidment, University of Pennsylvania (United States); Marcelo Vieira, Univ. de São Paulo (Brazil)

12467-41

Diagnostic performance characteristics of Chinese radiologists in breast cancer detection with FFDM versus DBT images

Author(s): Jia Lin Chua, Royal Prince Alfred Hospital (Australia); Tong Li, The Univ. of Sydney (Australia); Qin Xiao, Yajia Gu, Fudan Univ. Shanghai Cancer Ctr. (China); Melissa Robinson, Kriscia Tapia, Sarah J. Lewis, Phuong D. Trieu, The Univ. of Sydney (Australia)

12467-44

Task-aware denoising autoencoders for establishing efficient channels

Author(s): Weimin Zhou, Shanghai Jiao Tong Univ. (China)

12467-45

Evaluating generative stochastic image models using task-based image quality measures

Author(s): Varun A. Kelkar, Dimitrios S. Gotsis, Univ. of Illinois (United States); Rucha Deshpande, Washington Univ. in St. Louis (United States); Frank J. Brooks, Univ. of Illinois (United States); Prabhat KC, U.S. Food and Drug Administration (United States); Kyle J. Myers, Puente Solutions, LLC (United States); Rongping Zeng, U.S. Food and Drug Administration (United States); Mark A. Anastasio, Univ. of Illinois (United States)

12467-46

A Progress in diagnostic performances of Vietnamese doctors in reading mammograms with different Level of breast density via the VIETRAD program

Author(s): Iman Bint Talha, The Univ. of Sydney (Australia); Oanh T.M. Tran, Due T. Ong, Tuan A. Khuong, Thuy T. Hoang, Health Strategy and Policy Institute (Vietnam); Dennis Wong, Karen Ho, The Univ. of Sydney (Australia); Natacha Borecky, Mary Rickard, BreastScreen Australia (Australia); Sarah J. Lewis, Patrick C. Brennan, Phuong D. Trieu, The Univ. of Sydney (Australia)

12467-47

A task-specific deep-learning-based denoising approach for myocardial perfusion SPECT

Author(s): Md Ashequr Rahman, Zitong Yu, Barry A. Siegel, Abhinav K. Jha, Washington Univ. in St. Louis (United States)

12467-48

Attention-guided single-voxel attacks for three-dimensional neural networks: experiments with post-mortem CT segmentation

Author(s): Steven Lewis, Scott Doyle, Univ. at Buffalo (United States)

THURSDAY 23 FEBRUARY

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A
Seeing and feeling in robot-assisted surgery
(Keynote Presentation)
Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A
Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)
Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 7: TECHNOLOGY ASSESSMENT

23 February 2023 • 10:30 AM - 11:50 AM | Palm 5/6

Session Chair: Brandon D. Gallas, U.S. Food and Drug Administration (United States)

12467-28 • 10:30 AM - 10:50 AM | Palm 5/6

Optimizing data acquisition in undersampled magnetic resonance imaging (MRI) using two alternative forced choice (2-AFC) and search tasks

Author(s): Tavianne M. Kemp, Tetsuya A. Kawakita, Rehan Mehta, Angel R. Pineda, Manhattan College (United States)

12467-29 • 10:50 AM - 11:10 AM | Palm 5/6

Adaptive channels for signals with irregular shape in detection and search tasks

Author(s): Miguel A. Lago, Aldo Badano, U.S. Food and Drug Administration (United States)

12467-30 • 11:10 AM - 11:30 AM | Palm 5/6

Discriminability of non-Gaussian noise properties in computed tomography

Author(s): Kirsten Boedeker, Daniel W. Shin, Canon Medical Systems Corp. (United States); Luuk Oostveen, Ioannis Sechopoulos, Radboud Univ. Medical Ctr. (Netherlands); Craig K. Abbey, Univ. of California, Santa Barbara (United States)

12467-31 • 11:30 AM - 11:50 AM | Palm 5/6

Influence of magnet strength on background parenchymal enhancement evaluation

Author(s): Lindsay Douglas, Trisha Mondal, Alexandra Edwards, Maryellen L. Giger, The Univ. of Chicago (United States)

DIGITAL POSTERS

19 February 2023 • 8:00 AM - 8:00 AM | On Demand

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12467-37

Novel concept for systematic testing of AI models for MRI acquisition shifts with simulated data

Author(s): Christiane Posselt, Edith Gramotke, Hochschule für angewandte Wissenschaften Landshut (Germany); Abhijeet Parida, Sheikh Zayed Institute (United States); Mehmet Yigitsoy, deepc GmbH (Germany); Stefanie Remmele, Hochschule für angewandte Wissenschaften Landshut (Germany)

12467-38

Utilizing network analysis in blinded independent central review for clinical trials as adjudication agreement dashboard

Author(s): Manish Sharma, Sreesudha Kota, CALYX (India); Surabhi Bajpai, Kemberly Fernandes-Thomas, CALYX (United States); Madhuri Madasu, CALYX (India); Yibin Shao, CALYX (China); Rajesh Kaja, Rajesh Selvaraj, CALYX (India); Kira Cheng, Joy Luo, CALYX (China)

12467-42

High-quality label-free prediction of fluorescence images through stimulated raman scattering imaging and recurrent deep neural network

Author(s): Tianrun Chen, Zhejiang Univ. (China); Ying Zang, Huzhou Univ. (China); Jia Zhang, Yangzhou Polytechnic College (China); Delong Zhang, Zhejiang Univ. (China)

12467-43

Predictive adjudication rate modeling for prioritizing case distribution in BICR for oncology clinical trials

Author(s): Manish Sharma, Madhuri Madasu, CALYX (India); Surabhi Bajpai, Kim Fernandes-Thomas, CALYX (United States); Sreesudha Kota, CALYX (India); Yibin Shao, CALYX (China); Rajesh Selvaraj, Rajesh Kaja, CALYX (India); Kira Cheng, Joy Luo, CALYX (China)

CONFERENCE 12468

Biomedical Applications in Molecular, Structural, and Functional Imaging

19 - 22 February 2023 | Pacific E

Conference Chairs: **Barjor S. Gimi,** Tufts Medical Ctr. (United States); **Andrzej Krol,** SUNY Upstate Medical Univ. (United States)

Program Committee: **Amir A. Amini,** Univ. of Louisville (United States); **Cristian T. Badea,** Duke Univ. School of Medicine (United States); **Nancy L. Ford,** The Univ. of British Columbia (Canada); **William E. Higgins,** The Pennsylvania State Univ. (United States); **Ciprian N. Ionita,** SUNY Univ. at Buffalo (United States); **Vikram Kodibagkar,** Arizona State Univ. (United States); **Changqing Li,** Univ. of California, Merced (United States); **Armando Manduca,** Mayo Clinic College of Medicine (United States); **Robert C. Molthen,** Medical College of Wisconsin (United States); **Nicholas J. Tustison,** Univ. of Virginia (United States); **John B. Weaver,** Dartmouth Hitchcock Medical Ctr. (United States); **David L. Wilson,** Case Western Reserve Univ. (United States); **Axel Wismüller,** Univ. of Rochester Medical Ctr. (United States); **Baohong Yuan,** The Univ. of Texas at Arlington (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: **Symposium Chair Welcome and Best Student Paper Award Announcement**

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

5:40 pm: **New SPIE Fellows Acknowledgments**

5:45 pm: **SPIE Harrison H. Barrett Award in Medical Imaging**
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments *(Plenary Presentation)*
Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement**

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: MACHINE LEARNING AND DEEP LEARNING

20 February 2023 • 10:30 AM - 11:45 AM | Pacific E
Session Chair: Cristian T. Badea, Duke Univ. School of Medicine (United States)

12468-1 • 10:30 AM - 10:45 AM | Pacific E
ESFPNet: efficient deep learning architecture for real-time lesion segmentation in autofluorescence bronchoscopic video
Author(s): Qi Chang, The Pennsylvania State Univ. (United States); Danish Ahmad, Jennifer Toth, Rebecca Bascom, PennState Health Milton S. Hershey Medical Ctr. (United States); William E. Higgins, The Pennsylvania State Univ. (United States)

12468-2 • 10:45 AM - 11:00 AM | Pacific E
A deep learning based geographic attention model for body composition tissue segmentation
Author(s): Jian Dai, Yanshan Univ. (China); Jayaram K. Udupa, Drew A. Torigian, Yubing Tong, Univ. of Pennsylvania (United States); Pengju Nie, Jing Zhang, Ran Li, Shiwei Han, Tiange Liu, Yanshan Univ. (China)

12468-3 • 11:00 AM - 11:15 AM | Pacific E

Analysis of paracardial adipose tissues using deep learning segmentation in CT calcium score images

Author(s): Ammar Hoori, Tao Hu, Juhwan Lee, Case Western Reserve Univ. (United States); Sadeer Al-Kindi, Sanjay Rajagopalan, Univ. Hospitals of Cleveland (United States); David L. Wilson, Case Western Reserve Univ. (United States)

12468-4 • 11:15 AM - 11:30 AM | Pacific E

Combining graph neural networks and ROI-based convolutional neural networks to infer individualized graphs for Alzheimer's prediction

Author(s): Kevin Mueller, Anke Meyer-Baese, Gordon Erlebacher, Florida State Univ. (United States)

12468-5 • 11:30 AM - 11:45 AM | Pacific E

Deep learning texture analysis for the assessment of trabecular bone stiffness in CT

Author(s): Ran Yan, Qian Cao, Sriharsha Marupudi, Ravi Samala, Nicholas A. Petrick, U.S. Food and Drug Administration (United States)

Lunch Break 11:45 AM - 1:15 PM

SESSION 2: MRI, OPTICAL METHODS, AND APPLICATIONS

20 February 2023 • 1:15 PM - 3:15 PM | Pacific E

Session Chairs: William E. Higgins, The Pennsylvania State Univ. (United States), Vikram D. Kodibagkar, Arizona State Univ. (United States)

12468-6 • 1:15 PM - 1:30 PM | Pacific E

Dense fully connected network for precision NIR-II fluorescence molecular tomography

Author(s): Caiguang Cao, Anqi Xiao, Zhenhua Hu, Jie Tian, Institute of Automation (China)

12468-7 • 1:30 PM - 1:45 PM | Pacific E

Fully automated aortic segmentation of 3D phase-contrast magnetic resonance angiography images using deep learning techniques

Author(s): Jenita Manokaran, Univ. of Guelph (Canada); Julio Garcia Flores, Univ. of Calgary (Canada); Eranga Ukwatta, Univ. of Guelph (Canada)

12468-8 • 1:45 PM - 2:00 PM | Pacific E

Photoacoustic imaging of near-bone soft tissue vasculature in an ex vivo phantom

Author(s): Guessy Wang, Harvard TH Chan School of Public Health (United States); Jeremy Hix, Michigan State Univ. (United States); Lorenzo Tavelli, Harvard School of Dental Medicine, Harvard Univ. (United States); Yang Yang, Michigan State Univ. (United States)

12468-9 • 2:00 PM - 2:15 PM | Pacific E

Multi-Parametric MRI radiomics analysis with ensemble learning for prostate lesion classification

Author(s): Yuheng Li, Emory Univ. (United States); Jing Wang, Chih-Wei Chang, Pretsh Patel, Ashesh Jani, The Winship Cancer Institute of Emory Univ. (United States); Hui Mao, Emory Univ. (United States); Tian Liu, Xiaofeng Yang, The Winship Cancer Institute of Emory Univ. (United States)

12468-10 • 2:15 PM - 2:30 PM | Pacific E

Reproducibility of T1ρ MRI in the healthy human knee joint by measuring intra- and inter-vendor variability

Author(s): Ryan Armbruster, Univ. of Pennsylvania (United States); Anjali Talluru, Univ. of Pittsburgh (United States); Arijitt Borthakur, Warren Bilker, Ravinder Reddy, Univ. of Pennsylvania (United States); Susanta Sarkar, CadenzaMed (United States)

12468-11 • 2:30 PM - 2:45 PM | Pacific E

Multi-structure Segmentation on Cardiac MRI using Multilayer Perceptron Mixer Network

Author(s): Shaoyan Pan, Chaoqiong Ma, Chih-Wei Chang, Jacob Wynne, Justin Roper, Tian Liu, Xiaofeng Yang, Emory Univ. (United States)

12468-12 • 2:45 PM - 3:00 PM | Pacific E

PVOH and spontaneous Raman based images of spinal cord in the immediate aftermath of localized contusive injury obtained noninvasively and in vivo in a rat model using remitted light from a single spatially scanned laser

Author(s): Seth Fillioe, Kyle K. Bishop, Alexander V. S. Jannini, John J. I. Kim, Ricky McDonough, Steven Ortiz, Julie M. Hasenwinkel, Charles M. Peterson, Joseph Chaiken, Syracuse Univ. (United States)

12468-13 • 3:00 PM - 3:15 PM | Pacific E

Thrombosis region extraction and quantitative analysis in confocal laser scanning microscopic image sequence in in-vivo imaging

Author(s): Yunheng Wu, Masahiro Oda, Yuichiro Hayashi, Nagoya Univ. (Japan); Shuntaro Kawamura, Takanori Takebe, Tokyo Medical and Dental Univ. (Japan); Kensaku Mori, Nagoya Univ. (Japan)

Coffee Break 3:15 PM - 3:45 PM

SESSION 3: NOVEL IMAGING METHODS AND CONCEPTS I

20 February 2023 • 3:45 PM - 5:00 PM | Pacific E

Session Chairs: Changqing Li, Univ. of California, Merced (United States), Armando Manduca, Mayo Clinic (United States)

12468-14 • 3:45 PM - 4:00 PM | Pacific E

Experimental proof of record-short coincidence time resolution performance achieved in a 3 mm x 3 mm x 3 mm LYSO crystal

Author(s): Eric S. Harmon, LightSpin Technologies, Inc. (United States); Michael O. Thompson, Cornell Univ. (United States); Charles R. Schmidtlein, Memorial Sloan-Kettering Cancer Ctr. (United States); James Turner, Binghamton Univ. (United States); Alberto Gola, Giacomo Borghi, Stefano Merzi, Elena Moretti, Fondazione Bruno Kessler (Italy); Andrzej Krol, SUNY Upstate Medical Univ. (United States)

12468-15 • 4:00 PM - 4:15 PM | Pacific E

Automated detection of ribs in chest CT scans and assessment of changes in their morphology between Total Lung Capacity (TLC) and Residual Volume (RV)

Author(s): Syed Ahmed Nadeem, Alejandro P. Comellas, Eric A. Hoffman, Punam K. Saha, The Univ. of Iowa (United States)

12468-16 • 4:15 PM - 4:30 PM | Pacific E

Oxygenation imaging in deep tissue with X-Ray luminescence computed tomography (XLCT)

Author(s): Yibing Zhang, Yile Fang, Univ. of California, Merced (United States); Jeffrey N. Anker, Clemson Univ. (United States); Ge Wang, Rensselaer Polytechnic Institute (United States); Changqing Li, Univ. of California, Merced (United States); Sriparna Bhattacharya, Clemson Univ. (United States)

CONFERENCE 12468

12468-17 • 4:30 PM - 4:45 PM | Pacific E
Estimating normal metabolic activity for disease quantification via PET/CT images
Author(s): Jieyu Li, Tsinghua Univ. (China); Jayaram K. Udupa, Yubing Tong, Drew A. Torigian, Penn Medicine (United States)

12468-18 • 4:45 PM - 5:00 PM | Pacific E
Body mass classification from skeletal elements using landmark-free morphological atlas estimation with diffeomorphic shape mapping
Author(s): Heyuan Li, Gengxin Shi, Johns Hopkins Univ. (United States); Lauren Meckel, LSU Health Sciences Ctr. (United States); Deborah Cunningham, Daniel J. Wescott, Texas State Univ. (United States); Adam D. Sylvester, The Johns Hopkins Univ. School of Medicine (United States); Nicolas Charon, Wojciech Zbijewski, Johns Hopkins Univ. (United States)

POSTERS-MONDAY

20 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period: 5:00 PM Sunday – 5:00 PM Monday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Monday. Judging may begin after this time. Posters must remain on display until the end of the Monday evening poster session, but may be left hanging until 1:00 PM Tuesday.

12:00 PM to 5:00 PM: Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Monday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Tuesday for extended viewing. All Posters must be removed by 1:00 PM on Tuesday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12468-44
Determination of reproducible radiomic features for diagnosis of fatty liver disease in a crab-eating macaque model
Author(s): Hui Wang, Integrated Research Facility, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Jeffrey Solomon, Clinical Monitoring Research Program Directorate, Frederick National Lab. for Cancer Research (United States); Syed Reza, Ctr. for Infectious Disease Imaging, Radiology and Imaging Sciences, Clinical Ctr., National Institutes of Health (United States); Hee-Jeong Yang, Integrated Research Facility (United States); Ian Crozier, Clinical Monitoring Research Program Directorate, Frederick National Lab. for Cancer Research (United States); Philip J. Sayre, Integrated Research Facility, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Winston T. Chu, Ctr. for Infectious Disease Imaging, Radiology and Imaging Sciences, Clinical Ctr., National Institutes of Health (United States); Byeong Y. Lee, Venkatesh Mani, Integrated Research Facility, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Thomas Friedrich, David O'Connor, Univ. of Wisconsin-Madison (United States); Willem J. Mulder, Radboud Univ. Medical Ctr. (Netherlands); Gabriella Worwa, Jens H. Kuhn, Claudia Mani, Integrated Research Facility, National Institute of Allergy and Infectious Diseases, National Institutes of Health (United States); Marcelo A. Castro, National Institute of Allergy and Infectious Diseases (United States)

12468-45
Quantification of radiation damage for proton craniospinal irradiation using magnetic resonance imaging
Author(s): Chih-Wei Chang, Matt Goette, Nadja Kadom, Yinan Wang, Jacob Wynne, Emory Univ. School of Medicine (United States); Tonghe Wang, Memorial Sloan-Kettering Cancer Ctr. (United States); Tian Liu, Natia Esiashvili, Jun Zhou, Bree Eaton, Xiaofeng Yang, Emory Univ. School of Medicine (United States)

12468-46
Breast tumor margin delineation with high-resolution cone-beam x-ray computed tomography
Author(s): Nattawut Sinsuebphon, National Science and Technology Development Agency (Thailand); Suphawat Laohawiriyakamol, Prince of Songkla Univ. (Thailand); Chalinee Thanasupsombat, Sorapong Aootaphao, Walita Narkbuakaew, Atthasak Kiang-ia, Tanapon Srivongsa, National Science and Technology Development Agency (Thailand); Puttisak Puttawibul, Prince of Songkla Univ. (Thailand); Pairash Thajchayapong, Saowapak Thongvigitmanee, National Science and Technology Development Agency (Thailand)

12468-47
End-to-end brain tumor detection using a graph-feature-based classifier
Author(s): Mingzhe Hu, Emory Univ. (United States); Jing Wang, Chih-Wei Chang, Tian Liu, Xiaofeng Yang, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States)

12468-48
Advancing finite element analysis of osteological structures in biomedical research
Author(s): Matthew Wysocki, Scott Doyle, Univ. at Buffalo (United States)

12468-49
Automatic infarct segmentation in rat brain MR images after stroke using an adaptive deformable model
Author(s): Herng-Hua Chang, National Taiwan Univ. (Taiwan); Shin-Joe Yeh, National Taiwan Univ. Hospital (Taiwan); Yi-Ru Lin, National Taiwan Univ. (Taiwan); Ming-Chang Chiang, National Yang Ming Chiao Tung Univ. (Taiwan); Sung-Tsang Hsieh, National Taiwan Univ. Hospital (Taiwan)

12468-51
Multicenter aortic vessel tree extraction using deep learning
Author(s): Bernhard Scharinger, Antonio Pepe, Yuan Jin, Christina Gsaxner, Technische Univ. Graz (Austria); Jianning Li, Jan Egger, Universitätsklinikum Essen (Germany)

12468-52 • 6:00 PM - 8:00 PM | Pacific A
Performance of a bank of 2D efficient-nets for benign/malignant classification of lung nodules in 3D thoracic x-ray CT scans
Author(s): Tyler L. Settle, Benjamin Veasey, Albert Seow, Amir A. Amini, Univ. of Louisville (United States)

12468-53
Estimation of hemodynamics parameters with deep learning-based super-resolved 4D flow MRI velocity data
Author(s): Amirkhosro Kazemi, Sean Callahan, Marcus Stoddard, Amir A. Amini, Univ. of Louisville (United States)

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A
ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)
Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A
Human-AI collaboration *(Keynote Presentation)*
Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: VASCULAR IMAGING

21 February 2023 • 10:30 AM - 12:00 PM | Pacific E

Session Chairs: Ciprian N. Ionita, Univ. at Buffalo (United States), Amir A. Amini, Univ. of Louisville (United States)

12468-19 • 10:30 AM - 10:45 AM | Pacific E
Vascular pattern recognition for narrow-band imaging bronchoscopy
Author(s): Vahid Daneshpajooh, The Pennsylvania State Univ. (United States); Cedric Dumas, Institut Mines-Télécom (France); Danish Ahmad, Jennifer Toth, Rebecca Bascom, Penn State College of Medicine (United States); William E. Higgins, The Pennsylvania State Univ. (United States)

12468-20 • 10:45 AM - 11:00 AM | Pacific E
Multi-angled simultaneous biplane High-Speed Angiography (HSA) of patient-specific 3D-printed aneurysm phantoms using 1000 fps CdTe photon-counting detectors (PCD's)
Author(s): Emily Vanderbilt, Xinlin Wu, Allison Shields, S. V. Setlur Nagesh, Ciprian N. Ionita, Daniel R. Bednarek, Stephen Rudin, Univ. at Buffalo (United States), Canon Stroke and Vascular Research Ctr. (United States)

12468-21 • 11:00 AM - 11:15 AM | Pacific E
Determining 3D distributions of pulsatile blood flow using orthogonal Simultaneous Biplane High-Speed Angiography (SB-HSA) with 1000 fps CdTe photon counting detectors for 3D X-ray Particle Image Velocimetry (3D-XPIV) compared to results using Computational Fluid Dynamics (CFD)
Author(s): Xinlin Wu, Allison Shields, Emily Vanderbilt, S. V. Setlur Nagesh, Ciprian N. Ionitia, Daniel R. Bednarek, Stephen Rudin, Canon Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)

12468-22 • 11:15 AM - 11:30 AM | Pacific E
Comparison of pulsatile flow dynamics before and after endovascular intervention in 3D-printed patient-specific Internal Carotid Artery (ICA) aneurysm models using 1000 fps Photon Counting Detectors (PCD) for Simultaneous Biplane High Speed Angiography (SB-HSA)
Author(s): Xinlin Wu, Emily Vanderbilt, S. V. Setlur Nagesh, Allison Shields, Ciprian Ionita, Daniel R. Bednarek, Stephen Rudin, Canon Stroke and Vascular Research Ctr., Univ. at Buffalo (United States)

12468-23 • 11:30 AM - 11:45 AM | Pacific E
Intra-operative Optimal Flow Diverter Selection for Intracranial aneurysm treatment using Angiographic parametric imaging: Feasibility study.
Author(s): Parmita Mondal, Michael Udin, Mohammad Mahdi Shiraz Bhurwani, Kyle A. Williams, Ciprian N. Ionita, Univ. at Buffalo (United States)

12468-24 • 11:45 AM - 12:00 PM | Pacific E
Geometrically-independent contrast dilution gradient (CDG) velocimetry using photon counting 1000 fps high speed angiography (HSA) for 2D velocity distribution estimation
Author(s): Kyle A. Williams, Allison Shields, S. V. Setlur Nagesh, Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Canon Stroke and Vascular Research Ctr. (United States)

Lunch Break 12:00 PM - 1:15 PM

SESSION 5: CT/XR METHODS AND APPLICATIONS

21 February 2023 • 1:15 PM - 3:00 PM | Pacific E
Session Chair: Nancy L. Ford, The Univ. of British Columbia (Canada)

12468-25 • 1:15 PM - 1:30 PM | Pacific E
Advanced x-ray imaging techniques in tissue engineering: a new construct assessment platform for enabling the regeneration of personalised organs
Author(s): Savvas Savvidis, Univ. College London (United Kingdom); Mattia F.M. Gerli, Department of Surgical Biotechnology, Division of Surgery and Interventional Science (United States); Antonio Citro, Instituto de Investigación de la Diabetes de San Raffaele, IRCCS Ospedale San Raffaele (Italy); Lorenzo Massimi, Charlotte K. Hagen, Marco Endrizzi, Univ. College London (United Kingdom); Alessia Atzeni, Ctr. for Medical Image Computing, Univ. College London (United Kingdom); Alberto Astolfo, Michela Esposito, Univ. College London (United Kingdom); Olumide K. Ogunbiyi, Camelia Botnar Lab., Great Ormond Street Hospital (United Kingdom); Mark Turmaine, Elizabeth S. Smith, Silvia Cipiccia, Univ. College London (United Kingdom); Christoph Rau, Peng Li, Diamond Light Source Ltd. (United Kingdom); Roberto Lutman, Giulia Selmin, Natalie Durkin, Soichi Shibuya, Marianna Scuglia, Marco Pellegrini, Paolo De Coppi, UCL Great Ormond St. Institute of Child Health (United Kingdom); Alessandro Olivo, Univ. College London (United Kingdom)

12468-26 • 1:30 PM - 1:45 PM | Pacific E
Non-invasive coronary CT angiography identification of thin-cap fibroatheroma determined by intravascular optical coherence tomography
Author(s): Justin Kim, Juhwan Lee, Case Western Reserve Univ. (United States); Lia Gomez-Perez, The Ohio State Univ. (United States); Vladislav N. Zimin, Mohamed H. Makhlouf, Sadeer Al-Kindi, Univ. Hospitals Cleveland Medical Ctr. (United States); David L. Wilson, Case Western Reserve Univ. (United States)

CONFERENCE 12468

12468-27 • 1:45 PM - 2:00 PM | Pacific E

An enriched survival study of epicardial adipose tissues risk on major adverse cardiovascular event in CT calcium score images

Author(s): Ammar Hoori, Tao Hu, Juhwan Lee, Case Western Reserve Univ. (United States); Sadeer Al-kindi, Sanjay Rajagopalan, Univ. Hospitals of Cleveland (United States); David L. Wilson, Case Western Reserve Univ. (United States)

12468-29 • 2:00 PM - 2:15 PM | Pacific E

Attention-based CT scan interpolation for lesion segmentation of colorectal liver metastases

Author(s): Mohammad Hamghalam, Queen's Univ. (Canada); Richard Do, Memorial Sloan-Kettering Cancer Ctr. (United States); Amber L. Simpson, Queen's Univ. (Canada)

12468-30 • 2:15 PM - 2:30 PM | Pacific E

Ex vivo high-resolution hybrid micro-CT imaging using photon counting and energy integrating detectors

Author(s): Alex J. Allphin, Rohan Nadkarni, Darin P. Clark, Cristian T. Badea, Duke Univ. School of Medicine (United States)

12468-31 • 2:30 PM - 2:45 PM | Pacific E

Using in vivo respiratory-gated micro-computed tomography imaging to monitor pulmonary side effects in 10 MV FLASH and conventional radiotherapy

Author(s): Xi Ren, The Univ. of British Columbia (Canada); Luca Egoriti, The Univ. of British Columbia (Canada), TRIUMF (Canada); Nolan Esplen, Univ. of Victoria (Canada); Stephanie Rädel, Brandon Humphries, Hui-Wen Koay, TRIUMF (Canada); Thomas Planche, Cornelia Hoehr, TRIUMF (Canada), Univ. of Victoria (Canada); Alexander Gottberg, Univ. of Victoria (Canada), TRIUMF (Canada); Magdalena Bazalova-Carter, Univ. of Victoria (Canada); Nancy Ford, The Univ. of British Columbia (Canada)

12468-32 • 2:45 PM - 3:00 PM | Pacific E

Tracking the impact of global iodinated contrast agent shortage on radiology: analysis of CT exam volumes at a major US healthcare

Author(s): Axel Wismüller, Univ. of Rochester Medical Ctr. (United States); Jerome Avondo, Aidoc Medical (Israel); Larry Stockmaster, Univ. of Rochester Medical Ctr. (United States); Akhil Kasturi, Ali Vosoughi, Univ. of Rochester (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 6: NOVEL IMAGING METHODS AND CONCEPTS II

21 February 2023 • 3:30 PM - 5:00 PM | Pacific E

Session Chair: John B. Weaver, Dartmouth-Hitchcock Medical Ctr. (United States)

12468-33 • 3:30 PM - 3:45 PM | Pacific E

Automated segmentation and measurement of the levator hiatus in 3D transperineal ultrasound

Author(s): Zachary Szentimrey, Univ. of Guelph (Canada); Golafsoun Ameri, Cosm Medical Corp. (Canada); Rachel Y. K. Cheung, The Chinese Univ. of Hong Kong (Hong Kong, China); Ahmed Eltahawi, Cosm Medical Corp. (Canada), Suez Canal Univ. (Egypt); Eranga Ukwatta, Univ. of Guelph (Canada)

12468-34 • 3:45 PM - 4:00 PM | Pacific E

Development of fast and three-dimensional focused X-ray luminescence tomography system

Author(s): Yile Fang, Yibing Zhang, Michael C. Lun, Univ. of California, Merced (United States); Jeffrey N. Anker, Clemson Univ. (United States); Ge Wang, Rensselaer Polytechnic Institute (United States); Changqing Li, Univ. of California, Merced (United States)

12468-35 • 4:00 PM - 4:15 PM | Pacific E

Photoacoustic imaging using an optomechanical ultrasound sensor for future applications in breast cancer imaging

Author(s): Hilde Jans, Cedric Pieters, Deep Bera, Grim Keulemans, Roelof Jansen, Veronique Rochus, Jon Kjellman, Hasan M. Mahmud-Ul-Hasan, Xavier Rottenberg, imec (Belgium)

12468-36 • 4:15 PM - 4:30 PM | Pacific E

Assessing sex differences in joint kinematics and ligament recruitment in CMC-1 OA patients: a preliminary study

Author(s): Randa Mudathir, Megan Hutter, Carla du Toit, Lori Gardi, Robarts Research Institute (Canada); Nina Suh, Emory Univ. (United States); Emily Lalone, Western Univ. (Canada); Aaron Fenster, Robarts Research Institute (Canada)

12468-37 • 4:30 PM - 4:45 PM | Pacific E

ImageNomer: developing an interactive graphical analysis tool for examining fMRI and omics data

Author(s): Anton Orlichenko, Tulane Univ. (United States); Grant Daly, Univ. of South Alabama (United States); Jack W. Freeman, Colby College (United States); Yu-Ping Wang, Tulane Univ. (United States)

12468-38 • 4:45 PM - 5:00 PM | Pacific E

Effects of non-stationary blur on texture biomarkers of bone using ultra-high resolution CT

Author(s): Gengxin Shi, Johns Hopkins Univ. (United States); Fernando Quevedo Gonzalez, Ryan Breighneer, John Carrino, Hospital for Special Surgery (United States); Jeffery H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Wojciech Zbijewski, Johns Hopkins Univ. (United States)

Deep Learning in Medical Image Formation: Current Status and Future Directions

21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A
Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 PM - 10:30 PM

SESSION 7: NEUROIMAGING

22 February 2023 • 10:30 AM - 11:45 AM | Pacific E
Session Chairs: Axel Wismüller, Univ. of Rochester Medical Ctr. (United States), Nicholas J. Tustison, Univ. of Virginia (United States)

12468-39 • 10:30 AM - 10:45 AM | Pacific E
Investigating angiographic injection parameters for cerebral aneurysm hemodynamic characterization using patient-specific simulated angiograms
Author(s): Ruth White, Florida Institute of Technology (United States); Allison Shields, Setlur Nagesh, Jason Davies, Daniel R. Bednarek, Stephen Rudin, Ciprian N. Ionita, Univ. at Buffalo (United States); Venkat Keshav Chivukula, Florida Institute of Technology (United States)

12468-40 • 10:45 AM - 11:00 AM | Pacific E
Investigating the effect of cerebral atrophy on brain deformation using subject-specific models
Author(s): Allen Hong, The College of New Jersey (United States); Aaron Carass, Lianrui Zuo, Jerry L. Prince, Ahmed Alshareef, Johns Hopkins Univ. (United States)

12468-41 • 11:00 AM - 11:15 AM | Pacific E
Identification of schizophrenia patients using large-scale Extended Granger Causality (lsXGC) in functional MR imaging
Author(s): Axel Wismüller, Univ. of Rochester Medical Ctr. (United States); Ali Vosoughi, Akhil Kasturi, Nathan Hadjiyski, Univ. of Rochester (United States)

12468-42 • 11:15 AM - 11:30 AM | Pacific E
Large-scale Augmented Granger Causality (lsAGC) for discovery of causal brain connectivity networks in schizophrenia patients using functional MRI neuroimaging
Author(s): Axel Wismüller, Univ. of Rochester Medical Ctr. (United States); Ali Vosoughi, Akhil Kasturi, Nathan Hadjiyski, Univ. of Rochester (United States)

12468-43 • 11:30 AM - 11:45 AM | Pacific E
Large-Scale Granger Causality (lsGC) for classification of schizophrenia using functional MRI
Author(s): Axel Wismüller, Univ. of Rochester Medical Ctr. (United States); Ali Vosoughi, Akhil Kasturi, Nathan Hadjiyski, Univ. of Rochester (United States)

CONFERENCE 12468

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A

Seeing and feeling in robot-assisted surgery
(Keynote Presentation)

Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A

Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)

Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

DIGITAL POSTERS

19 February 2023 • 8:00 AM - 8:00 AM | On Demand

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12468-28

Representation of thoracic N1 lymph nodes group in contrast-enhanced CT images using distance maps based on tracheobronchial labeling

Author(s): Yoshiki Kawata, Hidenobu Suzuki, Tokushima Univ. (Japan); Yuji Matsumoto, Takaaki Tsuchida, National Cancer Ctr. Hospital (Japan); Keiju Aokage, National Cancer Ctr. Hospital East (Japan); Genichiro Ishii, National Cancer Ctr. (Japan); Masahiko Kusumoto, National Cancer Center Hospital (Japan); Noboru Niki, Medical Science Institute Inc. (Japan)

Imaging Informatics for Healthcare, Research, and Applications

19 - 21 February 2023 | Town & Country D

Conference Chair: **Brian J. Park,** Oregon Health & Science Univ. (United States); **Hiroyuki Yoshida,** Massachusetts General Hospital (United States)

Program Committee: **Peter R. Bak,** McMaster Univ. (Canada); **Po-Hao Chen,** Cleveland Clinic (United States); **Tessa S. Cook,** The Univ. of Pennsylvania Health System (United States); **Thomas M. Deserno,** Technische Univ. Braunschweig (Germany); **Jessica Fried,** Michigan Medicine (United States); **Steven C. Horii,** The Univ. of Pennsylvania Health System (United States); **Maria Y. Law,** Hong Kong Sanatorium and Hospital (Hong Kong, China); **Anh H. Le,** Roswell Park Comprehensive Cancer Ctr. (United States); **Heinz U. Lemke,** Computer Assisted Radiology and Surgery (Germany); **Brent J. Liu,** The Univ. of Southern California (United States); **Umber Shafique,** Indiana Univ. School of Medicine (United States); **Eliot L. Siegel,** Univ. of Maryland Medical Ctr. (United States); **Wyatt M. Tellis,** Univ. of California, San Francisco (United States); **Shandong Wu,** Univ. of Pittsburgh (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: Symposium Chair Welcome and Best Student Paper Award Announcement

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

SPIE.

5:40 pm: New SPIE Fellows Acknowledgments

5:45 pm: SPIE Harrison H. Barrett Award in Medical Imaging
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM
Reliable deep learning in dynamic environments *(Plenary Presentation)*
Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: Welcome and Introduction

8:35 AM: Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement

12463-501 • 8:40 AM - 9:20 AM | Town & Country A
State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*
Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A
Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*
Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: AI MODELS AND PLATFORMS

20 February 2023 • 10:30 AM - 12:10 PM | Town & Country D
Session Chairs: Brian J. Park, Oregon Health & Science Univ. (United States), Hiroyuki Yoshida, Massachusetts General Hospital (United States)

12469-1 • 10:30 AM - 10:50 AM | Town & Country D
CANCELED: Mr. EYE: An end-to-end cloud-based medical image analysis platform for modular AI models
Author(s): Estera Kot, Microsoft Corp. (Poland); Andrey Vykhodtsev, Microsoft Corp. (Slovenia); Adrian Calinescu, Microsoft Corp. (Romania); Ivan Tarapov, Alberto Santamaria-Pang, Microsoft Corp. (United States)

CONFERENCE 12469

12469-2 • 10:50 AM - 11:10 AM | Town & Country D
User Experience Evaluation for MIDRC AI interface
Author(s): Naveena Gorre, Moffitt Cancer Ctr. (United States); Jordan Fuhrman, The Univ. of Chicago (United States); Eduardo Carranza, Moffitt Cancer Ctr. (United States); Hui Li, The Univ. of Chicago (United States); Ravi K. Madduri, Argonne National Lab. (United States), The Univ. of Chicago (United States); Maryellen L. Giger, The Univ. of Chicago (United States); Issam El Naqa, Moffitt Cancer Ctr. (United States)

12469-3 • 11:10 AM - 11:30 AM | Town & Country D
Mendability Index: a new metric for estimating the effort required for manually editing auto-segmentations of objects of interest
Author(s): Da He, Shanghai Jiao Tong Univ. (China), Univ. of Pennsylvania (United States); Jayaram K. Udupa, Yubing Tong, Drew A. Torigian, Univ. of Pennsylvania (United States)

12469-4 • 11:30 AM - 11:50 AM | Town & Country D
Head and neck cancer radiation therapy treatment planning decision support and treatment benchmarking
Author(s): Trent Benedick, Mengxuan Li, Emilio Wang, Xinming Li, The Univ. of Southern California (United States); Anh Le, Roswell Park Comprehensive Cancer Ctr. (United States), Univ. at Buffalo, The State Univ. of New York (United States); Brent J. Liu, The Univ. of Southern California (United States)

12469-5 • 11:50 AM - 12:10 PM | Town & Country D
Characterizing browser-based medical imaging AI with serverless edge computing: towards addressing clinical data security constraints
Author(s): Chenxi Dong, Thomas Z. Li, Kaiwen Xu, Zekun Wang, Vanderbilt Univ. (United States); Fabien Maldonado, Kim Sandler, Vanderbilt Univ. Medical Ctr. (United States); Bennett A. Landman, Yuankai Huo, Vanderbilt Univ. (United States)

Lunch Break 12:10 PM - 1:30 PM

SESSION 2: AI BIASES AND DATA SECURITIES

20 February 2023 • 1:30 PM - 2:50 PM | Town & Country D
Session Chairs: Brent J. Liu, The Univ. of Southern California (United States), Umber Shafique, Indiana Univ. School of Medicine (United States)

12469-6 • 1:30 PM - 1:50 PM | Town & Country D
A robust two-step adversarial debiasing with partial learning - medical image case-studies
Author(s): Ramon Correra, Jiwoong Jason Jeong, Arizona State Univ. (United States); Bhavik Patel, Mayo Clinic (United States); Judy Gichoya, Emory Univ. (United States); Imon Banerjee, Mayo Clinic (United States)

12469-7 • 1:50 PM - 2:10 PM | Town & Country D
Sequestration methodology in practice through evaluation of joint demographic distributions of 54,185 patients in the Medical Imaging and Data Resource Center (MIDRC) data commons
Author(s): Natalie M. Baughan, Heather Whitney, Karen Drukker, The Univ. of Chicago Medicine (United States), Medical Imaging and Data Resource Ctr. (United States); Berkman Sahiner, Tingting Hu, U.S. Food and Drug Administration (United States); Grace Kim, Univ. of California (United States), Medical Imaging and Data Resource Ctr. (United States); Michael McNitt-Gray, Univ. of California, Los Angeles (United States), Medical Imaging and Data Resource Ctr. (United States); Kyle J. Myers, Medical Imaging and Data Resource Ctr. (United States), Puente Solutions, LLC (United States); Maryellen L. Giger, The Univ. of Chicago Medicine (United States), Medical Imaging and Data Resource Ctr. (United States)

12469-8 • 2:10 PM - 2:30 PM | Town & Country D
Anonymization and validation of 3-dimensional volumetric renderings of computed tomography (CT) data using commercially available T1W MRI-based algorithms
Author(s): Rahil Patel, Destie Provenzano, Murray Loew, The George Washington Univ. (United States)

12469-9 • 2:30 PM - 2:50 PM | Town & Country D
A standard informatics system and workflow to standardize DICOM data preprocessing at scale
Author(s): James Wetzel, Michael Ciancibello, Karli McMahan, Lindsey Marrero, Byron Miller, Po-Hao Chen, Cleveland Clinic (United States)

Coffee Break 2:50 PM - 3:20 PM

SESSION 3: MULTIMEDIA DATA AND HYBRID SYSTEMS

20 February 2023 • 3:20 PM - 5:20 PM | Town & Country D
Session Chairs: Brian J. Park, Oregon Health & Science Univ. (United States), Anh H. Le, Roswell Park Comprehensive Cancer Ctr. (United States)

12469-10 • 3:20 PM - 3:40 PM | Town & Country D
Video health monitoring for cardiac arrhythmia detection in a real hospital scenario
Author(s): Rik van Esch, Technische Univ. Eindhoven (Netherlands); Iris Cramer, Catharina Hospital (Netherlands); Xian Li, Technische Univ. Eindhoven (Netherlands); Cindy Verstappen, Carla Kloeze, Catharina Hospital (Netherlands); Marcel van 't Veer, Technische Univ. Eindhoven (Netherlands); Angelique Dierick, Fontys Univ. of Applied Sciences (Netherlands); Susan Hommerson, Technische Univ. Eindhoven (Netherlands); Leon Montenij, Lukas Dekker, Arthur Bouwman, Erik Korsten, Catharina Hospital (Netherlands); Jan Bergmans, Sander Stuijk, Svitlana Zinger, Technische Univ. Eindhoven (Netherlands)

12469-11 • 3:40 PM - 4:00 PM | Town & Country D
Respiration extraction and atrial fibrillation detection from clinical data based on single RGB camera
Author(s): Shuhao Que, Rik van Esch, Technische Univ. Eindhoven (Netherlands); Iris Cramer, Cindy Verstappen, Carla Kloeze, Marcel van 't Veer, Catharina Hospital (Netherlands); Angelique Dierick, Fontys Univ. of Applied Sciences (Netherlands); Susan Hommerson, Technische Univ. Eindhoven (Netherlands); Fokke van Meulen, Sebastiaan Overeem, Kempenhaeghe Heeze (Netherlands); Leon Montenij, Lukas Dekker, Arthur Bouwman, Erik Korsten, Catharina Hospital (Netherlands); Jan Bergmans, Svitlana Zinger, Sander Stuijk, Technische Univ. Eindhoven (Netherlands)

12469-12 • 4:00 PM - 4:20 PM | Town & Country D
Reliability estimation of armchair-based capacitive ECG using video-based pose estimation
Author(s): Satyam Srivastava, Birla Institute of Technology and Science, Pilani (India); Arman Ershadi, Mostafa Haghi, Thomas M. Deserno, Peter L. Reichertz Institut für Medizinische Informatik (Germany)

12469-13 • 4:20 PM - 4:40 PM | Town & Country D
Development of decision support tools for biomechanics utilizing the integrated biomechanics informatics system (IBIS)
Author(s): Anshu Goyal, Joseph Liu, Casey Wiens, Harper E. Stewart, Jill McNitt-Gray, Brent J. Liu, The Univ. of Southern California (United States)

12469-14 • 4:40 PM - 5:00 PM | Town & Country D

Development of information system on occupational exposure

Author(s): Kengo Tanaka, National Health Organization Yokohama Medical Ctr. (Japan); Rikuta Ishigaki, Shota Harumoto, RYUKYU ISG CO., LTD. (Japan); Hidenobu Suzuki, Yoshiki Kawata, Tokushima University. (Japan); Noboru Niki, Medical Science Institute, Inc. (Japan)

12469-15 • 5:00 PM - 5:20 PM | Town & Country D

A hybrid framework of traditional and deep learning segmentation methods with feature detection for optical coherence tomography (OCT) images

Author(s): Xinming Li, Anshu Goyal, The Univ. of Southern California (United States); Matthew Brown, Univ. of California, Los Angeles (United States); Benjamin Xu, Brent J. Liu, Sachi Pawooskar-Almeida, The Univ. of Southern California (United States)

POSTERS-MONDAY

20 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Monday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period: 5:00 PM Sunday – 5:00 PM Monday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Monday. Judging may begin after this time. Posters must remain on display until the end of the Monday evening poster session, but may be left hanging until 1:00 PM Tuesday.

12:00 PM to 5:00 PM: Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Monday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Tuesday for extended viewing. All Posters must be removed by 1:00 PM on Tuesday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12469-25

Three-dimensional video of facial surface synchronized with videofluoroscopic swallowing study

Author(s): Yukihiro Iida, Asahi Univ. (Japan), Massachusetts General Hospital (United States); Hiroyuki Yoshida, Massachusetts General Hospital (United States); Akitoshi Katsumata, Asahi Univ. (Japan)

12469-26

Machine learning-based bpMRI radiomics for differentiation of prostate cancer in PSA gray zone cases

Author(s): Weiwei Liu, RIMAG Medical Imaging Corp. (China); Rong Yuan, Peking Univ. Shenzhen Hospital (China)

12469-27

Integrating deep learning algorithm for the lung segmentation with body-part-specific anatomical classification of medical imaging data hosted by Medical Imaging and Data Resource Center (MIDRC)

Author(s): Nadya Shusharina, Massachusetts General Hospital (United States); Deepa Krishnaswamy, Brigham and Women's Hospital (United States); Paul Kinahan, Univ. of Washington (United States); Andrey Fedorov, Brigham and Women's Hospital (United States)

12469-29

Automated detection of colorectal polyps in photon-counting CT colonography

Author(s): Janne J. Näppi, Massachusetts General Hospital (United States), Harvard Medical School (United States); Toru Hironaka, Massachusetts General Hospital (United States); Dufan Wu, Massachusetts General Hospital (United States), Harvard Medical School (United States); Stephen R. Yoshida, Massachusetts General Hospital (United States); Rajiv Gupta, Massachusetts General Hospital (United States), Harvard Medical School (United States); Rie Tachibana, Massachusetts General Hospital (United States), National Institute of Technology, Oshima College (Japan), Harvard Medical School (United States); Katsuyuki Taguchi, Johns Hopkins Univ. (United States); Hiroyuki Yoshida, Massachusetts General Hospital (United States), Harvard Medical School (United States)

12469-30

Electronic cleansing in photon-counting CT colonography by use of self-supervised 3D-GAN

Author(s): Rie Tachibana, Massachusetts General Hospital (United States), National Institute of Technology, Oshima College (Japan), Harvard Medical School (United States); Janne J. Näppi, Massachusetts General Hospital (United States), Harvard Medical School (United States); Toru Hironaka, Stephen R. Yoshida, Massachusetts General Hospital (United States); Dufan Wu, Rajiv Gupta, Hiroyuki Yoshida, Massachusetts General Hospital (United States), Harvard Medical School (United States)

12469-31

Video-based in-vehicle action recognition for continuous health monitoring

Author(s): Ashwin Ramachandran, Kartik Gokhale, Indian Institute of Technology Bombay (India); Maike Kripps, Thomas M. Deserno, Peter L. Reichertz Institut für Medizinische Informatik (Germany)

12469-32

A web-based radiomics module for image feature extraction for tumor characterization

Author(s): Theresa Huebner, Technische Univ. Graz (Austria); Aaron Berger, Universitätsklinikum Essen (Germany); Daniel Wild, Jianning Li, Antonio Pepe, Christina Gsaxner, Yuan Jin, Technische Univ. Graz (Austria); Gijs Luijten, Jens Kleesiek, Jan Egger, Universitätsklinikum Essen (Germany)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A

ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)

Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A

Human-AI collaboration *(Keynote Presentation)*

Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

CONFERENCE 12469

SESSION 4: AUGMENTED REALITY AND THE DIGITAL OPERATING ROOM

21 February 2023 • 10:30 AM - 11:30 AM | Town & Country D

Session Chairs: Thomas Martin Deserno, Peter L. Reichertz Institut für Medizinische Informatik (Germany), Umber Shafique, Indiana Univ. School of Medicine (United States)

12469-16 • 10:30 AM - 10:50 AM | Town & Country D

A fully digitally integrated workflow for brain MRI Point Cloud generation and augmented reality 3D model visualization

Author(s): Jerry Y. Cai, Min-Keun (Kevin) Song, Univ. of Pennsylvania (United States); Gabriel Soliman, Temple Univ. (United States); Raveen Kariyawasam, Pranav Kodali, Albert Chen, Albi Domi, Univ. of Pennsylvania (United States); Laura Cai, Duke Univ. (United States); Josiah Somani, Chamith Rajapakse, Univ. of Pennsylvania (United States)

12469-17 • 10:50 AM - 11:10 AM | Town & Country D

Comparison of video capture cards for streaming real-time procedural imaging onto mixed reality headset

Author(s): Sana R. Shah, Catlin Gabel School (United States); Brian J. Park, Oregon Health & Science Univ. (United States)

12469-18 • 11:10 AM - 11:30 AM | Town & Country D

A proposal for communication of intraoperative contextual information via DICOM Unified Procedure Steps

Author(s): Patrick Beyersdorffer, Denise Junger, Oliver Burgert, Reutlingen Univ. (Germany)

Lunch Break 11:30 AM - 1:00 PM

SESSION 5: RADIOMICS

21 February 2023 • 1:00 PM - 2:00 PM | Town & Country D

Session Chairs: Hiroyuki Yoshida, Massachusetts General Hospital (United States), Anh H. Le, Roswell Park Comprehensive Cancer Ctr. (United States)

12469-19 • 1:00 PM - 1:20 PM | Town & Country D

A pipeline for multivariate genome-wide associations studies with morphological brain features

Author(s): Gabrielle Dagasso, Matthias Wilms, Nils D. Forkert, Univ. of Calgary (Canada)

12469-21 • 1:20 PM - 1:40 PM | Town & Country D

Predicting left/right lung volumes, thoracic cavity volume, and heart volume from subject demographics to improve lung transplant

Author(s): Lucas Pu, Univ. of Pittsburgh (United States); Joseph Leader, University of Pittsburgh (United States); Alaa Ali, Univ. of Pittsburgh (United States); Zihan Geng, Carnegie Mellon University (United States); David Wilson, University of Pittsburgh (United States)

12469-22 • 1:40 PM - 2:00 PM | Town & Country D

Deep learning-based end-to-end scan-type classification, pre-processing, and segmentation of clinical neuro-oncology studies

Author(s): Satrajit Chakrabarty, Washington Univ. in St. Louis (United States); Syed A. Abidi, Mina Mousa, Mahati Mokkarala, Matthew Kelsey, Pamela LaMontagne, Aristeidis Sotiras, Daniel S. Marcus, Washington Univ. School of Medicine in St. Louis (United States)

SESSION 6: RADIOLOGY REPORTING

21 February 2023 • 2:00 PM - 2:40 PM | Town & Country D

Session Chair: Brian J. Park, Oregon Health & Science Univ. (United States)

12469-23 • 2:00 PM - 2:20 PM | Town & Country D

Radiology report generation using transformers conditioned with non-imaging data

Author(s): Nurbanu Aksoy, Nishant Ravikumar, Alejandro F. Frangi, Univ. of Leeds (United Kingdom)

12469-24 • 2:20 PM - 2:40 PM | Town & Country D

A generative-discriminative deep learning approach to classify radiology reports based on the presence of follow up recommendations

Author(s): Pan Xiao, Xiaobing Yu, Aaron Mintz, Jieqi Wang, Mahati Mokkarala, Vamsi Narra, Daniel Marcus, Andrew Bierhals, Aristeidis Sotiras, Washington Univ. in St. Louis (United States)

Deep Learning in Medical Image Formation: Current Status and Future Directions

21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC
21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

WEDNESDAY MORNING KEYNOTES

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A
Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A
From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*
Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A
Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*
Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Ultrasonic Imaging and Tomography

22 - 23 February 2023 | Town & Country D

Conference Chair: **Christian Boehm,** ETH Zurich (Switzerland); **Nick Bottenus,** Univ. of Colorado Boulder (United States)

Program Committee: **Mark A. Anastasio,** Washington Univ. in St. Louis (United States); **Johan G. Bosch,** Erasmus Univ. Rotterdam (Netherlands); **Brett C. Byram,** Vanderbilt Univ. (United States); **Marvin M. Doyley,** Univ. of Rochester (United States); **Aaron Fenster,** Robarts Research Institute (Canada); **James F. Greenleaf,** Mayo Clinic (United States); **Lluis Guasch,** Imperial College London (United Kingdom); **Joaquin L. Herraiz,** Univ. Complutense de Madrid (Spain); **Torsten Hopp,** Karlsruher Institut für Technologie (Germany); **Peter E. Huthwaite,** Imperial College London (United Kingdom); **Michael Jaeger,** Univ. Bern (Switzerland); **Jørgen Arendt Jensen,** Technical Univ. of Denmark (Denmark); **David H. Kim,** Pohang Univ. of Science and Technology (Korea, Republic of); **Cuiping Li,** Delphinus Medical Technologies, Inc. (United States); **Bilal H. Malik,** Genentech Inc. (United States); **Stephen A. McAleavey,** Univ. of Rochester (United States); **Mohammad Mehrmohammadi,** Univ. of Rochester (United States); **Svetoslav I. Nikolov,** BK Medical (Denmark); **Olivier Roy,** Barbara Ann Karmanos Cancer Institute (United States); **Nicole V. Ruiter,** Karlsruher Institut für Technologie (Germany); **Daniel Sarno,** National Physical Lab. (United Kingdom); **François Varray,** CREATIS (France); **James W. Wiskin,** QT Ultrasound LLC (United States); **Haichong Kai Zhang,** Worcester Polytechnic Institute (United States)

TUESDAY 21 FEBRUARY

Deep Learning in Medical Image Formation: Current Status and Future Directions

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WEDNESDAY 22 FEBRUARY

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Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A
Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*
Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 1: ULTRASOUND RECONSTRUCTION

22 February 2023 • 10:30 AM - 11:50 AM | Town & Country D
Session Chairs: Nick Bottenus, Univ. of Colorado Boulder (United States), Hassan Rivaz, Concordia Univ. (Canada)

12470-1 • 10:30 AM - 10:50 AM | Town & Country D
First imaging results with the new generation of the KIT 3D ultrasound tomography device
Author(s): Torsten Hopp, Michael Zapf, Laura Fernandez-Lago, Fridtjof Feldbusch, Hartmut E. Gemmeke, Nicole V. Ruiter, Karlsruher Institut für Technologie (Germany)

12470-2 • 10:50 AM - 11:10 AM | Town & Country D
Array fault tolerance for 3D volography
Author(s): James W. Wiskin, John Klock, QT Imaging, Inc. (United States)

12470-3 • 11:10 AM - 11:30 AM | Town & Country D
Improving three-dimensional automated breast ultrasound resolution with orthogonal images
Author(s): Claire K. Park, Tiana Trumpour, Western Univ. (Canada), Robarts Research Institute (Canada); Igor Gyacskov, Jeffrey S. Bax, David Tessier, Lori Gardi, Robarts Research Institute (Canada); Madeline Ico, Western Univ. (Canada); Aaron Fenster, Western Univ. (Canada), Robarts Research Institute (Canada)

12470-4 • 11:30 AM - 11:50 AM | Town & Country D
Ultrasound time reversal imaging of extended targets using a broadband white noise constraint processor
Author(s): Chengyang Huang, Francesco Lanza di Scalea, Univ. of California, San Diego (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: ULTRASOUND BEAMFORMING AND SIGNAL PROCESSING

22 February 2023 • 1:20 PM - 3:00 PM | Town & Country D
Session Chairs: Mengxing Tang, Imperial College London (United Kingdom), Claire K. Park, Western Univ. (Canada)

12470-6 • 1:20 PM - 1:40 PM | Town & Country D
Correlation-based ultrasound imaging with phase coherence and phase imaging
Author(s): Maxime Bilodeau, Nicolas Quaegebeur, Patrice Masson, Univ. de Sherbrooke (Canada)

12470-5 • 1:40 PM - 2:00 PM | Town & Country D
Correlation-based ultrasound imaging using experimental baseline
Author(s): Tamara Krpic, Maxime Bilodeau, Nicolas Quaegebeur, Patrice Masson, Univ. de Sherbrooke (Canada)

12470-7 • 2:00 PM - 2:20 PM | Town & Country D
Distributed aberration correction in handheld ultrasound based on tomographic estimates of the speed of sound
Author(s): Rehman Ali, Trevor Mitcham, Univ. of Rochester Medical Ctr. (United States); Melanie Singh, Univ. of Rochester (United States); Richard Bouchard, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Jeremy J. Dahl, Stanford Univ. School of Medicine (United States); Marvin M. Doyley, Neb Duric, Univ. of Rochester (United States)

12470-8 • 2:20 PM - 2:40 PM | Town & Country D
Real-time Element Position Tracking of Flexible Array Transducer for Ultrasound Beamforming
Author(s): Debarghya China, The Johns Hopkins Univ. School of Medicine (United States); Ziwei Feng, The Johns Hopkins Univ. School of Medicine (United States), Johns Hopkins Univ. (United States); Hamed Hooshangnejad, Daniel Sforza, Prasad Vagdargi, The Johns Hopkins Univ. School of Medicine (United States); Muyinatu A. Lediju Bell, Johns Hopkins Univ. (United States), The Johns Hopkins Univ. School of Medicine (United States); Ali Uneri, Kai Ding, The Johns Hopkins Univ. School of Medicine (United States)

12470-9 • 2:40 PM - 3:00 PM | Town & Country D
Real-time 3D ultrafast shear wave absolute vibro-elastography
Author(s): Hoda Sadat Hashemi, Shahed Mohammed, The Univ. of British Columbia (Canada); Reza Zahiri Azar, DarkVision Technologies, Inc. (Canada); Robert N. Rohling, Septimiu E. Salcudean, The Univ. of British Columbia (Canada)

Coffee Break 3:00 PM - 3:30 PM

CONFERENCE 12470

Joint Session with Conferences 12466 and 12470

22 February 2023 • 3:30 PM - 5:10 PM | Town & Country D

Session Chairs: Mohammad Mehrmohammadi, Univ. of Rochester (United States), Elvis C.S. Chen, Robarts Research Institute (Canada)

12466-38 • 3:30 PM - 3:50 PM | Town & Country D

Computational Modeling Towards Focused Ultrasound Therapy for Spinal Cord Injury: Visualization of Beam Propagation through Patient-Specific Anatomy

Author(s): Avisha Kumar, Max J. Kerensky, Eduardo Gonzalez, Muyinatu Bell, Nicholas Theodore, Nitish Thakor, Amir Manbachi, Johns Hopkins Univ. (United States)

12470-11 • 3:50 PM - 4:10 PM | Town & Country D

3D ultrasound to investigate synovial blood flow in 1st carpometacarpal osteoarthritis

Author(s): Megan Hutter, Randa Mudathir, Robarts Research Institute (Canada), Western Univ. (Canada); Carla du Toit, Robarts Research Institute (Canada); Robert Dima, Western Univ. (Canada); Lori Gardi, Robarts Research Institute (Canada); Nina Suh, Emory Univ. (United States); Emily A. Lalone, Western Univ. (Canada); Aaron Fenster, Robarts Research Institute (Canada), Western Univ. (Canada)

12470-12 • 4:10 PM - 4:30 PM | Town & Country D

Three-dimensional ultrasound for quantitation of synovial tissue volume in knee osteoarthritis

Author(s): Robert Dima, Carla du Toit, Jennifer Polus, Trevor Birmingham, C. Thomas Appleton, Aaron Fenster, Western Univ. (Canada)

12466-39 • 4:30 PM - 4:50 PM | Town & Country D

An open-source 3D Slicer module for fluoro-free transcatheter vessel navigation

Author(s): Hareem Nisar, Patrick Carnahan, Western Univ. (Canada); Daniel Bainbridge, London Health Sciences Ctr. (Canada); Elvis C. S. Chen, Terry M. Peters, Western Univ. (Canada)

12466-40 • 4:50 PM - 5:10 PM | Town & Country D

Point-of-care ultrasound carotid artery volume reconstruction using deep-learning

Author(s): Michellie Choi, Shuwei Xing, Terry M. Peters, Elvis C. S. Chen, Robarts Research Institute (Canada)

POSTERS-WEDNESDAY

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12470-28

Deep ultrasound denoising without clean data

Author(s): Sobhan Goudarzi, Hassan Rivaz, Concordia Univ. (Canada)

12470-29

Optimal view detection for ultrasound-guided supraclavicular block using convolutional neural networks

Author(s): Donghyeon Baek, Chungnam National Univ. College of Medicine (Korea, Republic of); Yumin Jo, Chungnam National Univ. College of Medicine (Korea, Republic of), Chungnam National Univ. Hospital (Korea, Republic of); Jongtak Baek, Chungnam National Univ. Hospital (Korea, Republic of), Chungnam National Univ. (Korea, Republic of); Saewhan Yoo, Seoul National Univ. Hospital (Korea, Republic of); Boohwi Hong, Chungnam National Univ. College of Medicine (Korea, Republic of), Chungnam National Univ. Hospital (Korea, Republic of); Dongheon Lee, Chungnam National Univ. (Korea, Republic of), Chungnam National Univ. Hospital (Korea, Republic of)

12470-30

A freehand 3D ultrasound carotid scanning system for point-of-care ultrasonography

Author(s): Bo-Wen Ren, Bernard C. Y. Chiu, City Univ. of Hong Kong (Hong Kong, China)

12470-31

Ultrasound-based dominant intraprostatic lesion classification with Swin Transformer

Author(s): Yuheng Li, Boran Zhou, Jing Wang, Shaoyan Pan, Ashesh B. Jani, Emory Univ. (United States); Tian Liu, Pretsh Patel, Xiaofeng Yang, The Winship Cancer Institute of Emory Univ. (United States)

12470-32

Adoption and evaluation of a multistatic Fourier-based synthetic aperture radar method for ultrasound imaging

Author(s): Edgar M. G. Dorausch, Daniel Swist, TU Dresden (Germany); Moritz Herzog, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Christoph Statz, Julian Kober, Cornelius Kühnöl, Tönnis Trittler, TU Dresden (Germany); Nora Martens, Franz Brinkmann, Jochen Hampe, Universitätsklinikum Carl Gustav Carus Dresden (Germany); Gerhard P. Fettweis, TU Dresden (Germany)

12470-33

Radiomic feature robustness evaluations in ultrasound imaging

Author(s): Jing Wang, Boran Zhou, Xiaofeng Yang, The Winship Cancer Institute of Emory Univ. (United States)

12470-34

Ultrasound breast tumor detection based on vision graph neural network

Author(s): Mingzhe Hu, Emory Univ. (United States); Jing Wang, Chih-Wei Chang, Tian Liu, Xiaofeng Yang, Emory Univ. (United States), The Winship Cancer Institute of Emory Univ. (United States)

12470-35

Evaluating imaging reproducibility of portable ultrasound devices with histogram analysis: a phantom study

Author(s): Jing Wang, Boran Zhou, The Winship Cancer Institute of Emory Univ. (United States); Deborah Marshall, Icahn School of Medicine at Mount Sinai (United States); Mylin A. Torres, The Winship Cancer Institute of Emory Univ. (United States); Xiaofeng Yang, The Winship Cancer Institute of Emory Univ. (United States)

12470-36

Improved right ventricular strain estimation in rats using anisotropic diffusion filtering

Author(s): Tanmay Mukherjee, Sunder Neelakantan, Texas A&M Univ. (United States); Gaurav Choudhary, The Warren Alpert Medical School of Brown Univ. (United States), Providence Veterans Affairs Medical Ctr. (United States); Reza Avazmohammadi, Texas A&M Univ. (United States)

12470-37

Deep learning-based skull-induced artifact reduction for transcranial ultrasound imaging: simulation study

Author(s): Yichuan Tang, Srikar Nekkanti, Vanshika Rohera, Benjamin Nephew, Jean A. King, Haichong K. Zhang, Worcester Polytechnic Institute (United States)

12470-24

A deep learning approach for patchless estimation of ultrasound quantitative parametric image with uncertainty measurement

Author(s): Ali Kafaei Zad Tehrani, Concordia Univ. (Canada); Ivan M. Rosado-Mendez, Hayley Whitson, Univ. of Wisconsin School of Medicine and Public Health (United States); Hassan Rivaz, Concordia Univ. (Canada)

THURSDAY 23 FEBRUARY

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A
Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A
Seeing and feeling in robot-assisted surgery
(Keynote Presentation)
Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A
Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)
Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: ULTRASOUND IMAGE QUANTIFICATION AND CLASSIFICATION

23 February 2023 • 10:40 AM - 11:40 AM | Town & Country D
Session Chairs: Rehman Ali, Univ. of Rochester Medical Ctr. (United States), Shang Gao, Worcester Polytechnic Institute (United States)

12470-13 • 10:40 AM - 11:00 AM | Town & Country D
Quantitative imaging with a single probe in abdominal ultrasound

Author(s): Myeong-Gee Kim, Seok Hwan Oh, Youngmin Kim, Guil Jung, Hyeon-jik Lee, KAIST (Korea, Republic of); Hyuksool Kwon, Seoul National Univ. Bundang Hospital (Korea, Republic of); Hyeon-Min Bae, KAIST (Korea, Republic of)

12470-14 • 11:00 AM - 11:20 AM | Town & Country D
Quantitative methods for molecular ultrasound imaging

Author(s): Negar Sadeghipour, The Univ. of Oklahoma (United States); Farbod Tabesh, Arutselvan Natarajan, Stanford Univ. School of Medicine (United States); Meredith A. Jones, Xuxin Chen, The Univ. of Oklahoma (United States); Ramasamy Paulmurugan, Stanford Univ. School of Medicine (United States); Bin Zheng, The Univ. of Oklahoma (United States); Ahmed El Kaffas, Stanford Univ. School of Medicine (United States)

12470-15 • 11:20 AM - 11:40 AM | Town & Country D
Classifying acoustical response of oxygenated and deoxygenated hemoglobin microbubbles using deep learning.

Author(s): Teja R. Pathour, Sugandha Chaudhary, Baowei Fei, Shashank R. Sirsi, The Univ. of Texas at Dallas (United States)

Lunch Break 11:40 AM - 1:20 PM

SESSION 5: ULTRASOUND WAVEFORM TOMOGRAPHY

23 February 2023 • 1:20 PM - 3:00 PM | Town & Country D
Session Chairs: Torsten Hopp, Karlsruher Institut für Technologie (Germany), Ines Elisa Ulrich, ETH Zurich (Switzerland)

12470-17 • 1:20 PM - 1:40 PM | Town & Country D
CANCELED: An open-source toolbox for high-resolution ultrasound tomography of the breast using two-point ray tracing

Author(s): Ashkan Javaherian, Univ. College London (United Kingdom)

12470-18 • 1:40 PM - 2:00 PM | Town & Country D
Shape optimization for transcranial ultrasound computed tomography

Author(s): Patrick Marty, Christian Boehm, Andreas Fichtner, ETH Zurich (Switzerland)

12470-19 • 2:00 PM - 2:20 PM | Town & Country D
Impact of starting model on waveform inversion in ultrasound tomography

Author(s): Rehman Ali, Trevor Mitcham, Univ. of Rochester Medical Ctr. (United States); Nebojsa Duric, Univ. of Rochester Medical Ctr. (United States)

12470-20 • 2:20 PM - 2:40 PM | Town & Country D
3D full-waveform inversion in ultrasound computed tomography employing a ring-array

Author(s): Fu Li, Univ. of Illinois (United States); Umberto Villa, The Univ. of Texas at Austin (United States); Nebojsa Duric, Univ. of Rochester Medical Ctr. (United States); Mark A. Anastasio, Univ. of Illinois (United States)

CONFERENCE 12470

12470-21 • 2:40 PM - 3:00 PM | Town & Country D

3D ultrasound volography enabled by next generation NVIDIA A100

Author(s): James W. Wiskin, QT Imaging, Inc. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 6: APPLICATIONS OF MACHINE LEARNING IN ULTRASOUND

23 February 2023 • 3:30 PM - 4:50 PM | Town & Country D
Session Chair: Christian Boehm, ETH Zurich (Switzerland)

12470-22 • 3:30 PM - 3:50 PM | Town & Country D

A deep learning-based image reconstruction method for USCT that employs multimodal input images

Author(s): Gangwon Jeong, Fu Li, Univ. of Illinois (United States); Umberto Villa, The Univ. of Texas at Austin (United States); Mark A. Anastasio, Univ. of Illinois (United States)

12470-23 • 3:50 PM - 4:10 PM | Town & Country D

Feature-aggregated spatiotemporal spine surface estimation for wearable patch ultrasound volumetric imaging

Author(s): Baichuan Jiang, Keshuai Xu, Abhay Moghekar, Peter Kazanzides, Emad M. Boctor, Johns Hopkins Univ. (United States)

12470-25 • 4:10 PM - 4:30 PM | Town & Country D

Augmenting endometriosis analysis from ultrasound data using deep learning

Author(s): Adrian Balica, Jennifer Dai, Kayla Piiwaa, Rutgers Robert Wood Johnson Medical School (United States); Xiao Qi, Rutgers, The State Univ. of New Jersey (United States); Nancy Phillips, Susan Egan, Rutgers Robert Wood Johnson Medical School (United States); Ilker Hacihaliloglu, The Univ. of British Columbia (Canada)

12470-26 • 4:30 PM - 4:50 PM | Town & Country D

A deep learning framework to estimate elastic modulus from ultrasound measured displacement fields

Author(s): Utsav Ratna Tuladhar, Richard A. Simon, Cristian A. Linte, Michael S. Richards, Rochester Institute of Technology (United States)

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19 February 2023 • 8:00 AM - 8:00 AM | On Demand
The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12470-10

Lamina landmark detection in ultrasound images: a preliminary study

Author(s): Sen Li, Lou Gauthier, Farida Cheriet, Ecole de Technologie Supérieure (Canada); Carole Fortin, Philippe Paquette, Univ. de Montréal (Canada); Catherine Laporte, Ecole de Technologie Supérieure (Canada)

12470-16

Comparing flow in helical and straight stents using 2D ultrasound particle image velocimetry

Author(s): Ashkan Ghanbarzadeh-Dagheyan, Univ. Twente (Netherlands); Lennart van de Velde, University of Twente (Netherlands); Michel Reijnen, Rijnstate (Netherlands); Michel Versluis, Erik Groot Jebbink, Univ. Twente (Netherlands)

12470-27

ADC-Net: adaptive detail compensation network for prostate segmentation in 3D transrectal ultrasound images

Author(s): Mengqing Liu, Kaizhi Wu, Nanchang Hangkong Univ. (China); Liping Jiang, The First Affiliated Hospital of Nanchang Univ. (China)

CONFERENCE 12471

Digital and Computational Pathology

19 - 23 February 2023 | Palm 3/4

Conference Chairs: **John E. Tomaszewski,** Univ. at Buffalo (United States); **Aaron D. Ward,** The Univ. of Western Ontario (Canada)

Program Committee: **Selim Aksoy,** Bilkent Univ. (Turkey); **Ulysses J. Balis,** Univ. of Michigan Health System (United States); **Rohit Bhargava,** Univ. of Illinois at Urbana-Champaign (United States); **Ulf-Dietrich Braumann,** Institut für Angewandte Informatik e.V. (Germany); **Bradley Brimhall,** The Univ. of Texas Health Science Ctr. at San Antonio (United States); **Matthew J. Cecchini,** London Health Sciences Ctr. (Canada); **Keith C. Cheng,** Penn State College of Medicine (United States); **Wei-Chung Cheng,** U.S. Food and Drug Administration (United States); **Eric Cosatto,** NEC Labs. America, Inc. (United States); **Scott Doyle,** Rutgers, The State Univ. of New Jersey (United States); **Alton B. Farris,** Emory Univ. (United States); **Michael D. Feldman,** The Univ. of Pennsylvania Health System (United States); **Marios A. Gavrielides,** AstraZeneca Pharmaceuticals LP (United States); **April Khademi,** Toronto Metropolitan Univ. (Canada); **Elizabeth A. Krupinski,** Emory Univ. School of Medicine (United States); **Tom R. L. Kimpe,** Barco N.V. (Belgium); **Richard M. Levenson,** Univ. of California, Davis (United States); **Olivier Lezoray,** Univ. de Caen Basse-Normandie (France); **Geert Litjens,** Radboud Univ. Medical Ctr. (Netherlands); **Anant Madabhushi,** Emory Univ. School of Medicine (United States); **Derek R. Magee,** Univ. of Leeds (United Kingdom); **Erik Meijering,** The Univ. of New South Wales (Australia); **James P. Monaco,** Inspirata, Inc. (United States); **Mehdi Moradi,** IBM Research (United States); **Bahram Parvin,** Lawrence Berkeley National Lab. (United States); **Nasir M. Rajpoot,** The Univ. of Warwick (United Kingdom); **Berkman Sahiner,** U.S. Food and Drug Administration (United States); **Pinaki Sarder,** Univ. of Florida College of Medicine (United States); **Chukka Srinivas,** Amazon Lab126 (United States); **Darren Treanor,** Univ. of Leeds (United Kingdom); **Jeroen van der Laak,** Radboud Univ. Nijmegen Medical Ctr. (Netherlands); **Mitko Veta,** Technische Univ. Eindhoven (Netherlands); **Martin J. Yaffe,** Sunnybrook Research Institute (Canada); **Bülent Yener,** Rensselaer Polytechnic Institute (United States)

SUNDAY 19 FEBRUARY

SPIE MEDICAL IMAGING AWARDS AND PLENARY

19 February 2023 • 5:30 PM - 5:50 PM | Town & Country A

5:30 pm: Symposium Chair Welcome and Best Student Paper Award Announcement

First-placae winner and runner-up of the Robert F. Wagner All-Conference Best Student Paper Award
Sponsored by:

5:40 pm: New SPIE Fellows Acknowledgments

5:45 pm: SPIE Harrison H. Barrett Award in Medical Imaging
Presented in recognition of outstanding accomplishments in medical imaging

12465-601 • 5:50 PM - 6:30 PM

Reliable deep learning in dynamic environments *(Plenary Presentation)*

Zachary Chase Lipton, Carnegie Mellon Univ. (United States)

MONDAY 20 FEBRUARY

MONDAY MORNING KEYNOTES

20 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Rebecca Fahrig, Siemens Healthineers (Germany), Brian J. Park, Oregon Health & Science Univ. (United States)

8:30 AM: Welcome and Introduction

8:35 AM: Robert F. Wagner Award Finalists Announcements for Conferences 12463 and 12469 Physics of Medical Imaging Best Paper Award Announcement

12463-501 • 8:40 AM - 9:20 AM | Town & Country A

State of the art in the task-based assessment of medical imaging systems *(Keynote Presentation)*

Kyle J. Myers, Puente Solutions, LLC (United States)

12469-502 • 9:20 AM - 10:00 AM | Town & Country A

Federated learning: how the world's biggest federation is training state-of-the-art brain tumor segmentation models *(Keynote Presentation)*

Prashant Shah, Intel Health and Life Sciences (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 1: AUTOMATED QUANTIFICATION OF TISSUE BIOMARKERS

20 February 2023 • 10:30 AM - 11:50 AM | Palm 3/4

Session Chairs: Richard M. Levenson, Univ. of California, Davis (United States), John E. Tomaszewski, Univ. at Buffalo (United States)

12471-1 • 10:30 AM - 10:50 AM | Palm 3/4

Self supervised deep learning to predict molecular markers from routine histopathology slides for glioblastoma tumors

Author(s): Shobhit Agarwal, Olivia Krebs, Case Western Reserve Univ. (United States); Pallavi Tiwari, Univ. of Wisconsin-Madison (United States)

CONFERENCE 12471

12471-2 • 10:50 AM - 11:10 AM | Palm 3/4

Integrating color deconvolution thresholding and weakly supervised learning for automated segmentation of neurofibrillary tangle and neuropil threads

Author(s): Hyung Seok Roh, David J. Irwin, James C. Gee, Paul A. Yushkevich, Min Chen, Univ. of Pennsylvania (United States); Mónica Muñoz López, Maria Mercedes Iñiguez de Onzoño Martin, Univ. de Castilla-La Mancha (Spain); Ranjit Ittyerah, Sydney Lim, Madigan L. Bedard, John L. Robinson, Theresa Schuck, Univ. of Pennsylvania (United States); Emilio Artacho-Pérula, María del Mar Arroyo Jiménez, María Pilar Marcos Rabal, Francisco Javier Molina Romero, Sandra Cebada Sánchez, José Carlos Delgado González, Carlos de la Rosa-Prieto, Marta Córcoles Parada, Univ. de Castilla-La Mancha (Spain); Edward B. Lee, Daniel T. Ohm, Univ. of Pennsylvania (United States); Laura E. M. Wisse, Lund Univ. (Sweden); David A. Wolk, Univ. of Pennsylvania (United States); Ricardo Insausti, Univ. de Castilla-La Mancha (Spain)

12471-3 • 11:10 AM - 11:30 AM | Palm 3/4

Deep learning to predict the proportion of positive cells in CMYC-stained tissue microarrays of diffuse large B-cell lymphoma

Author(s): Thomas E. Tavolara, Wake Forest School of Medicine (United States); M. Khalid Khan Niazi, Wake Forest Univ. School of Medicine (United States); David L. Jaye, Emory Univ. (United States); Christopher Flowers, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States); Lee Cooper, Northwestern Univ. (United States); Metin N. Gurcan, Wake Forest School of Medicine (United States)

12471-4 • 11:30 AM - 11:50 AM | Palm 3/4

Single-Cell Gene Expression Prediction using H&E Images based on Spatial Transcriptomics

Author(s): Chao-Hui Huang, YoSon Park, Jincheng Pang, Jadwiga Bienkowska, Pfizer Inc. (United States)

Lunch Break 11:50 AM - 1:20 PM

SESSION 2: MULTI-STAIN, MULTIPLEXED, AND MULTISPECTRAL IMAGING AND ANALYSIS I

20 February 2023 • 1:20 PM - 3:00 PM | Palm 3/4
Session Chairs: Martin J. Yaffe, Sunnybrook Research Institute (Canada), Aaron D. Ward, Western Univ. (Canada)

12471-5 • 1:20 PM - 1:40 PM | Palm 3/4

Identification of molecular cell type of breast cancer on digital histopathology images using deep learning and multiplexed fluorescence imaging

Author(s): Wenchao Han, Sunnybrook Research Institute (Canada), Univ. of Toronto (Canada); Alison M. Cheung, Sunnybrook Research Institute (Canada); Vishwesh Ramanathan, Univ. of Toronto (Canada); Dan Wang, Kela Liu, Sunnybrook Research Institute (Canada); Martin J. Yaffe, Anne L. Martel, Sunnybrook Research Institute (Canada), Univ. of Toronto (Canada)

12471-6 • 1:40 PM - 2:00 PM | Palm 3/4

A video transformer network for thyroid cancer detection on hyperspectral histologic images

Author(s): Minh H. Tran, Ofelia Gomez, Baowei Fei, The Univ. of Texas at Dallas (United States)

12471-7 • 2:00 PM - 2:20 PM | Palm 3/

A transformer-based computational approach for H&E to multiplexed immunohistochemistry stain translation

Author(s): Chang Bian, Tim Cootes, Martin Fergie, The Univ. of Manchester (United Kingdom)

12471-8 • 2:20 PM - 2:40 PM | Palm 3/4

Extended depth of field imaging for mosaic hyperspectral images

Author(s): Armand Rathgeb, Ling Ma, Minh H. Tran, The Univ. of Texas at Dallas (United States); Baowei Fei, The Univ. of Texas at Dallas (United States), The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States)

12471-9 • 2:40 PM - 3:00 PM | Palm 3/4

Influence of cell-type ratio on spatially resolved single-cell transcriptomes using the Tangram algorithm: based on implementation on single-cell and MxIF data

Author(s): Can Cui, Shunxing Bao, Vanderbilt Univ. (United States); Jia Li, Vanderbilt Univ. Medical Ctr. (United States); Ruining Deng, Lucas W. Remedios, Zuhayr Asad, Vanderbilt Univ. (United States); Sophie Chiron, Vanderbilt Univ. Medical Ctr. (United States); Ken S. Lau, Vanderbilt Univ. (United States); Yaohong Wang, Vanderbilt Univ. Medical Ctr. (United States); Lori A. Coburn, Keith T. Wilson, Vanderbilt Univ. Medical Ctr. (United States), VA Tennessee Valley Healthcare System (United States); Joseph T. Roland, Vanderbilt Univ. Medical Ctr. (United States); Bennett A. Landman, Vanderbilt Univ. (United States); Qi Liu, Vanderbilt Univ. Medical Ctr. (United States); Yuankai Huo, Vanderbilt Univ. (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 3: MULTI-STAIN, MULTIPLEXED, AND MULTISPECTRAL IMAGING AND ANALYSIS II

20 February 2023 • 3:30 PM - 5:30 PM | Palm 3/4
Session Chairs: Martin J. Yaffe, Sunnybrook Research Institute (Canada), John E. Tomaszewski, Univ. at Buffalo (United States)

12471-10 • 3:30 PM - 3:50 PM | Palm 3/4

Topological-preserving membrane skeleton segmentation in multiplex immunofluorescence imaging

Author(s): Shunxing Bao, Can Cui, Vanderbilt Univ. (United States); Jia Li, Vanderbilt Univ. Medical Ctr. (United States); Yucheng Tang, Ho Hin Lee, Ruining Deng, Lucas W. Remedios, Xin Yu, Qi Yang, Vanderbilt Univ. (United States); Sophie Chiron, Vanderbilt Univ. Medical Ctr. (United States); Nathan H. Patterson, Vanderbilt Univ. (United States); Ken S. Lau, Qi Liu, Joseph T. Roland, Lori A. Coburn, Keith T. Wilson, Bennett A. Landman, Vanderbilt Univ. Medical Ctr. (United States); Yuankai Huo, Vanderbilt Univ. (United States)

12471-11 • 3:50 PM - 4:10 PM | Palm 3/4

Interpretable graph convolutional network enables triple negative breast cancer detection in imaging mass cytometry

Author(s): Peng Lu, Karolyn A. Oetjen, Daniel L. J. Thorek, Washington Univ. in St. Louis (United States)

12471-12 • 4:10 PM - 4:30 PM | Palm 3/4

Generation of RGB EVG stained image from hyperspectral H and E stained image using generative adversarial network (GAN)

Author(s): Tanwi Biswas, Tokyo Institute of Technology (Japan); Hiroyuki Suzuki, Gunma Univ. (Japan); Masahiro Ishikawa, Naoki Kobayashi, Saitama Medical Univ. (Japan); Takashi Obi, Tokyo Institute of Technology (Japan)

12471-13 • 4:30 PM - 4:50 PM | Palm 3/4

Semi-supervised contrastive learning for white blood cell segmentation from label-free quantitative phase imaging

Author(s): Sourya Sengupta, Michael Fanous, Mark Anastasio, Hua Li, Univ. of Illinois (United States)

12471-14 • 4:50 PM - 5:10 PM | Palm 3/4

An end-to-end pipeline for 3D slide-wise multi-stain renal pathology registration

Author(s): Peize Li, Ruining Deng, Yuankai Huo, Vanderbilt Univ. (United States)

12471-15 • 5:10 PM - 5:30 PM | Palm 3/4

Improving quantification of renal fibrosis using deep-DUET

Author(s): Samuel Border, Univ. of Florida (United States); Richard Levenson, Univ. of California, Davis (United States); Avi Rosenberg, Johns Hopkins Univ. (United States); Jarcy Zee, Univ. of Pennsylvania (United States); Kuang Jen, Univ. of California, Davis (United States); Pinaki Sarder, Univ. of Florida College of Medicine (United States); Farzad Fereidouni, Univ. of California, Davis (United States)

TUESDAY 21 FEBRUARY

TUESDAY MORNING KEYNOTES

21 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Olivier Colliot, Ctr. National de la Recherche Scientifique (France), Claudia R. Mello-Thoms, Univ. Iowa Carver College of Medicine (United States)

8:30 AM: **Welcome and Introduction**
8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12464 and 12467 Image Processing Student Paper Award Announcement**

12464-503 • 8:40 AM - 9:20 AM | Town & Country A

ENIGMA, big data, & the human brain: worldwide neuroimaging & genomics of 30 brain diseases in 100,000 people from 45 countries
(Keynote Presentation)

Paul M. Thompson, The Univ. of Southern California (United States)

12467-504 • 9:20 AM - 10:00 AM | Town & Country A

Human-AI collaboration *(Keynote Presentation)*

Mark Steyvers, Univ. of California, Irvine (United States)

Coffee Break 10:00 AM - 10:30 AM

SESSION 4: GRADING AND CLASSIFICATION OF PATHOLOGY IMAGES I

21 February 2023 • 10:30 AM - 11:50 AM | Palm 3/4

Session Chairs: Pinaki Sarder, Univ. of Florida College of Medicine (United States), Aaron D. Ward, Western Univ. (Canada)

12471-16 • 10:30 AM - 10:50 AM | Palm 3/4

Biopsy and surgical specimen specific deep learning models for prostate cancer detection on digitized pathology images

Author(s): Brennan Flannery, Case Western Reserve Univ. (United States); Priti Lal, Univ. of Pennsylvania (United States); Juan C. Santa-Rosario, CorePlus Servicios Clínicos y Patológicos, LLC (United States); Anant Madabhushi, Case Western Reserve Univ. (United States), Emory Univ. (United States), Louis Stokes Cleveland Dept. of Veterans Affairs Medical Ctr. (United States); Maria Natalizio, CorePlus Servicios Clínicos y Patológicos, LLC (United States)

12471-17 • 10:50 AM - 11:10 AM | Palm 3/4

Analysing hyperplasia in Atlantic salmon gills using empirical wavelets

Author(s): Alexander F. Carmichael, Johanna L. Baily, Univ. of Stirling (United Kingdom); Annette Boerlage, George Gunn, Scotland's Rural College (United Kingdom); Rosa Allshire, Univ. of Stirling (United Kingdom); Deepayan Bhowmik, Newcastle Univ. (United Kingdom)

12471-20 • 11:10 AM - 11:30 AM | Palm 3/4

Quintet margin loss for an improved knowledge distillation in histopathology image analysis

Author(s): Trinh Thi Le Vuong, Jin Tae Kwak, Korea Univ. (Korea, Republic of)

12471-19 • 11:30 AM - 11:50 AM | Palm 3/4

Spatially Aware Transformer Networks for Contextual Prediction of Diabetic Nephropathy Progression from Whole Slide Images

Author(s): Benjamin Shickel, Nicholas Lucarelli, Univ. of Florida (United States); Donghwan Yun, Kyung Chul Moon, Seoul National Univ. College of Medicine (Korea, Republic of); Pinaki Sarder, Univ. of Florida College of Medicine (United States)

Lunch Break 11:50 AM - 1:30 PM

SESSION 5: GRADING AND CLASSIFICATION OF PATHOLOGY IMAGES II

21 February 2023 • 1:30 PM - 2:50 PM | Palm 3/4

Session Chairs: Pinaki Sarder, Univ. of Florida College of Medicine (United States), John E. Tomaszewski, Univ. at Buffalo (United States)

12471-21 • 1:30 PM - 1:50 PM | Palm 3/4

Ki67 proliferation index quantification using silver standard masks

Author(s): Seyed Hossein Mirjahanmardi, Stanford Univ. (United States); Melanie Dawe, Anthony Fyles, Wei Shi, Univ. Health Network (Canada); Dimitri Androutsos, Toronto Metropolitan Univ. (Canada); Fei-Fei Liu, Susan Done, Univ. Health Network (Canada); April Khademi, Toronto Metropolitan Univ. (Canada)

12471-22 • 1:50 PM - 2:10 PM | Palm 3/4

The effects of sparsity induction methods on attention-based multiple instance learning applied to Camelyon16

Author(s): Thomas E. Tavolara, Metin N. Gurcan, M. Khalid Khan Niazi, Wake Forest School of Medicine (United States)

12471-23 • 2:10 PM - 2:30 PM | Palm 3/4

On the benefits of region of interest segmentation for whole slide image classification

Author(s): Cihan Erkan, Selim Aksoy, Bilkent Univ. (Turkey)

12471-24 • 2:30 PM - 2:50 PM | Palm 3/4

Background detection affects downstream classification of Camelyon16 whole slide images

Author(s): Thomas E. Tavolara, M. Khalid Khan Niazi, Metin N. Gurcan, Wake Forest School of Medicine (United States)

Coffee Break 2:50 PM - 3:30 PM

CONFERENCE 12471

21 February 2023 • 3:30 PM - 4:30 PM | Palm 3/4

Session Chairs: Selim Aksoy, Bilkent Univ. (Turkey), Aaron D. Ward, Western Univ. (Canada)

12471-28 • 3:30 PM - 3:50 PM | Palm 3/4

Generating simulated fluorescence images for enhancing proteins from optical microscopy images of cells using massive-training artificial neural networks

Author(s): Xu Lei, Fahad Parvez Mahdi, Ze Jin, Tokyo Institute of Technology (Japan); Yoshiyuki Noguchi, Masayuki Murata, The Univ. of Tokyo (Japan); Kenji Suzuki, Tokyo Institute of Technology (Japan)

12471-29 • 3:50 PM - 4:10 PM | Palm 3/4

An accelerated pipeline for multi-label renal pathology image segmentation at the whole slide image level

Author(s): Haoju Leng, Ruining Deng, Zuhayr Asad, Vanderbilt Univ. (United States); R. Michael Womick, The Univ. of North Carolina at Chapel Hill (United States); Haichun Yang, Vanderbilt Univ. Medical Ctr. (United States); Lipeng Wan, Georgia State Univ. (United States); Yuankai Huo, Vanderbilt Univ. (United States)

12471-30 • 4:10 PM - 4:30 PM | Palm 3/4

MIMO U-Net: efficient cell segmentation and counting in microscopy image sequences

Author(s): Palak Dave, Univ. of South Florida (United States); Yaroslav Kolinko, Charles Univ. (Czech Republic); Hunter Morera, Kurtis Allen, Univ. of South Florida (United States); Saeed Alahmari, Najran Univ. (Saudi Arabia); Dmitry Goldgof, Lawrence O. Hall, Peter R. Mouton, Univ. of South Florida (United States)

Deep Learning in Medical Image Formation: Current Status and Future Directions

21 February 2023 • 6:00 PM - 8:00 PM | Town & Country A

Chairs: Lifeng Yu, Mayo Clinic (United States) and Rebecca Fahrig, Siemens Healthineers (Germany)

Deep learning has been increasingly used in image reconstruction, artifact correction, and noise reduction in medical image formation. The objective of this workshop is to update the SPIE Physics of Medical Imaging community on the latest development of deep learning applications in medical imaging formation. At this workshop, experts in the field will provide an overview of the current status and future directions in this area.

Live Demonstrations Workshop

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Workshop Chairs: Karen Drukker, The Univ. of Chicago Medicine (United States); Lubomir M. Hadjiiski, Michigan Medicine (United States); Horst Karl Hahn, Fraunhofer-Institut für Digitale Medizin MEVIS (Germany)

The goal of this workshop is to provide a forum for systems and algorithms developers to show off their creations. The intent is for the audience to be inspired to conduct derivative research, for the demonstrators to receive feedback and find new collaborators, and for all to learn about the rapidly evolving field of medical imaging. The Live Demonstrations Workshop invites participation from all attendees of the SPIE Medical Imaging symposium. Workshop demonstrations include samples, systems, and software demonstrations that depict the implementation, operation, and utility of cutting-edge as well as mature research. Having an accepted SPIE Medical Imaging paper is not required for giving a live demonstration. A Certificate of Merit Award and $500 prize sponsored by Siemens Healthineers will be presented to one demonstration considered to be of exceptional interest.

View the Special Event Page for more details including how to apply.

Publicly Available Data and Tools to Promote Machine Learning: an interactive workshop exploring the MIDRC

21 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Session Chairs: Berkman Sahiner, U.S. Food and Drug Administration (United States), Maryellen L. Giger, The Univ. of Chicago (United States)

Workshop Chairs: Berkman Sahiner, US Food & Drug Adminsitration (United States) and Maryellen Giger, the Univ. of Chicago (United States)

In this workshop, we will introduce the data collection and curation methods; the user portal for accessing data including tools designed specifically for cohort building; system evaluation approaches and tools including evaluation metric selection; as well as tools for diversity assessment, identification and mitigation of bias and more. Co-led by AAPM, ACR and RSNA, the Medical Imaging and Data Resource Center (MIDRC; midrc.org) aims to foster machine learning innovation through data sharing for rapid and flexible collection, analysis, and dissemination of imaging and associated clinical data by providing researchers with unparalleled resources in the fight against COVID-19 and beyond. The infrastructure and resources in MIDRC are designed with the intent to facilitate the effective and efficient translation of innovative tools into clinical practice.

WEDNESDAY 22 FEBRUARY

22 February 2023 • 8:00 AM - 10:10 AM | Town & Country A

Session Chairs: Khan M. Iftekharuddin, Old Dominion Univ. (United States), Aaron D. Ward, Western Univ. (Canada)

8:00 AM: **Welcome and Introduction**

8:05 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12465, 12468, and 12471 Computer-Aided Diagnosis Best Paper Award Announcement**

12465-505 • 8:10 AM - 8:50 AM | Town & Country A

From code to clinic: challenges in translating ML models into real-world products *(Keynote Presentation)*

Dale Webster, Google Health (United States)

12468-506 • 8:50 AM - 9:30 AM | Town & Country A

Clinical applications of fast and quantitative MR fingerprinting *(Keynote Presentation)*

Dan Ma, Case Western Reserve Univ. (United States)

12471-507 • 9:30 AM - 10:10 AM | Town & Country A

Translating computational innovations into reality: Focus on the users! *(Keynote Presentation)*

Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States)

Coffee Break 10:10 AM - 10:30 AM

SESSION 7: COMPUTER-AIDED DIAGNOSIS, PROGNOSIS AND PREDICTIVE ANALYSIS I

22 February 2023 • 10:30 AM - 11:50 AM | Palm 3/4

Session Chairs: Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States), John E. Tomaszewski, Univ. at Buffalo (United States)

12471-31 • 10:30 AM - 10:50 AM | Palm 3/4

Weakly supervised deep learning for predicting the response to hormonal treatment of women with atypical endometrial hyperplasia: a feasibility study

Author(s): Seyed M. M. Kahaki, U.S. Food and Drug Administration (United States); Ian S. Hagemann, Washington Univ. School of Medicine in St. Louis (United States); Kenny Cha, Christopher J. Trindade, Nicholas Petrick, U.S. Food and Drug Administration (United States); Nicolas Kostelecky, Department of Pathology, Northwestern University Feinberg School of Medicine (United States); Weijie Chen, U.S. Food and Drug Administration (United States)

12471-32 • 10:50 AM - 11:10 AM | Palm 3/4

Spatial connectivity of tumor and associated cells (SpaCell): a novel computational pathology biomarker

Author(s): Germán Corredor, Can F. Koyuncu, Emory Univ. (United States); Andrew Janowczyk, Case Western Reserve Univ. (United States), Ctr. Hospitalier Univ. Vaudois (Switzerland); Paula Toro, Cleveland Clinic (United States); Sepideh Azarianpour, Case Western Reserve Univ. (United States); James Lewis, Vanderbilt Univ. Medical Ctr. (United States); Anant Madabhushi, Emory Univ. (United States), U.S. Dept. of Veterans Affairs (United States)

12471-33 • 11:10 AM - 11:30 AM | Palm 3/4

Transformer as a spatial information aware multi-instance learning framework to predict the risk of death for early-stage non-small cell lung cancer

Author(s): Yufei Zhou, Case Western Reserve Univ. (United States); Can F. Koyuncu, Cristian-Barrera, Germán Corredor, Emory Univ. (United States); Xiangxue Wang, Nanjing Univ. of Information Science & Technology (China); Cheng Lu, Guangdong Academy of Medical Sciences (China); Anant Madabhushi, Emory Univ. (United States)

12471-34 • 11:30 AM - 11:50 AM | Palm 3/4

Spatial uncertainty aggregation for false negatives detection in breast cancer metastases segmentation

Author(s): Milda Poceviciute, Gabriel Eilertsen, Claes Lundström, Linköping Univ. (Sweden)

Lunch Break 11:50 AM - 1:20 PM

SESSION 8: COMPUTER-AIDED DIAGNOSIS, PROGNOSIS AND PREDICTIVE ANALYSIS II

22 February 2023 • 1:20 PM - 3:00 PM | Palm 3/4

Session Chairs: Elizabeth A. Krupinski, Emory Univ. School of Medicine (United States), Aaron D. Ward, Western Univ. (Canada)

12471-35 • 1:20 PM - 1:40 PM | Palm 3/4

A novel H&E color augmentation for domain invariance classification of unannotated histopathology prostate cancer images

Author(s): Roozbeh Bazargani, Wanwen Chen, Sadaf Sadeghian, Maryam Asadi, Jeffrey Boschman, Amirali Darbandsari, Ali Bashashati, Septimiu Salcudean, The Univ. of British Columbia (Canada)

12471-36 • 1:40 PM - 2:00 PM | Palm 3/4

Ink removal in whole slide images using hallucinated data

Author(s): Vishwesh Ramanathan, Wenchao Han, Univ. of Toronto (Canada), Sunnybrook Research Institute (Canada); Dina Bassiouny, Sunnybrook Health Sciences Ctr. (Canada), Mansoura Univ. (Egypt); Eileen Rakovitch, Sunnybrook Health Sciences Ctr. (Canada), Univ. of Toronto (Canada); Anne L. Martel, Univ. of Toronto (Canada), Sunnybrook Research Institute (Canada)

12471-37 • 2:00 PM - 2:20 PM | Palm 3/4

Predicting cell type counts in whole slide histology images using evidential multi-task learning

Author(s): Naga Raju Gudhe, Univ. of Eastern Finland (Finland); Mazen Sudah, Kuopio Univ. Hospital (Finland); Arto Mannermaa, Veli-Matti Kosma, Hamid Behravan, Univ. of Eastern Finland (Finland)

12471-38 • 2:20 PM - 2:40 PM | Palm 3/4

Efficient subtyping of ovarian cancer histopathology whole slide images using active sampling in multiple instance learning

Author(s): Jack Breen, Katie Allen, Kieran Zucker, Univ. of Leeds (United Kingdom); Geoff Hall, Univ. of Leeds (United Kingdom), The Leeds Teaching Hospitals NHS Trust (United Kingdom); Nicolas M. Orsi, Nishant Ravikumar, Univ. of Leeds (United Kingdom)

12471-39 • 2:40 PM - 3:00 PM | Palm 3/4

Deep learning combined with ball scale transform for circulating tumor cell enumeration in digital pathology

Author(s): Leihui Tong, Conestoga High School (United States); Yuan Wan, State Univ. of New York at Binghamton (United States)

Coffee Break 3:00 PM - 3:30 PM

SESSION 9: MEDICAL APPLICATIONS

22 February 2023 • 3:30 PM - 5:30 PM | Palm 3/4

Session Chairs: Geert J.S. Litjens, Radboud Univ. Medical Ctr. (Netherlands), Aaron D. Ward, Western Univ. (Canada)

12471-40 • 3:30 PM - 3:50 PM | Palm 3/4

An ensemble approach for histopathological classification of vulvar cancer

Author(s): Raghava Vinaykanth Mushunuri, Fraunhofer MEOS, Erfurt (Germany); Matthias Choschzick, UniversitätsSpital Zürich (Switzerland); Ulf-Dietrich Braumann, Jürgen Hess, Fraunhofer MEOS, Erfurt (Germany)

12471-41 • 3:50 PM - 4:10 PM | Palm 3/4

Combining multiple variable ground truth annotations for segmentation training for segmentation training for oral cavity cancer

Author(s): Jonathan Folmsbee, Univ. at Buffalo (United States); Margaret Brandwein-Weber, Icahn School of Medicine at Mount Sinai (United States); Scott T. Doyle, Univ. at Buffalo (United States)

12471-42 • 4:10 PM - 4:30 PM | Palm 3/4

Minimizing the intra- pathologist disagreement for tumor bud detection on H&E images using weakly supervised learning

Author(s): Thomas E. Tavolara, Wake Forest School of Medicine (United States); Wei Chen, Wendy L. Frankel, The Ohio State Univ. Wexner Medical Ctr. (United States); Metin N. Gurcan, M. Khalid Khan Niazi, Wake Forest School of Medicine (United States)

CONFERENCE 12471

12471-43 • 4:30 PM - 4:50 PM | Palm 3/4

A pathomic study for risk stratification and unraveling molecular associations of different histologic subtypes of papillary thyroid cancer

Author(s): Shayan Monabbati, Case Western Reserve Univ. (United States); Sirvan Khalighi, Emory Univ. School of Medicine (United States); Pingfu Fu, Sylvia Asa, Case Western Reserve Univ. (United States); Anant Madabhushi, Emory Univ. School of Medicine (United States)

12471-44 • 4:50 PM - 5:10 PM | Palm 3/4

Multi-scale contrastive learning with attention for histopathology image classification

Author(s): Jing Wei Tan, Korea Univ. (Korea, Republic of); Khoa Tuan Nguyen, Ghent Univ. Global Campus (Korea, Republic of); Won-Ki Jeong, Korea Univ. (Korea, Republic of)

12471-45 • 5:10 PM - 5:30 PM | Palm 3/4

Predicting Crohn's disease severity in the colon using mixed cell nucleus density from pseudo labels

Author(s): Lucas W. Remedios, Shunxing Bao, Cailey I. Kerley, Leon Y. Cai, Francois Rheault, Ruining Deng, Can Cui, Vanderbilt Univ. (United States); Sophie Chiron, Vanderbilt Univ. Medical Ctr. (United States); Ken S. Lau, Vanderbilt Univ. (United States); Joseph T. Roland, Mary K. Washington, Lori A. Coburn, Keith T. Wilson, Vanderbilt Univ. Medical Ctr. (United States); Yuankai Huo, Bennett A. Landman, Vanderbilt Univ. (United States)

POSTERS-WEDNESDAY

22 February 2023 • 6:00 PM - 8:00 PM | Pacific A

Conference attendees are invited to attend the SPIE Medical Imaging poster Session on Wednesday evening. Come view the posters, enjoy light refreshments, ask questions, and network with colleagues in your field. Attendees are required to wear their conference registration badges.

24-Hour Poster Setup Period:
5:00 PM Tuesday – 5:00 PM Wednesday *

*In order to be considered for a poster award, it is recommended to have your poster set up by 1:00 PM Wednesday. Judging may begin after this time. Posters must remain on display until the end of the Wednesday evening poster Session, but may be left hanging until 1:00 PM Thursday.

12:00 PM to 5:00 PM:

Pre-Session Viewing Posters will be on display as presenters arrive and hang them. Stop by any time between noon and 5:00 PM on Wednesday to browse the available posters before the evening Session begins.

Next-Day Viewing and Tear-Down Posters may be left hanging until 1:00 PM on Thursday for extended viewing. All Posters must be removed by 1:00 PM on Thursday. Any unclaimed posters will be discarded.

View poster presentation guidelines and set-up instructions at **https://spie.org/MI/Poster-Presentation-Guidelines**

12471-50

Digital pathology whole slide image compression with vector quantized variational autoencoders

Author(s): Jason Keighley, Marc de Kamps, Univ. of Leeds (United Kingdom); Alexander Wright, Darren Treanor, Univ. of Leeds (United Kingdom), The Leeds Teaching Hospitals NHS Trust (United Kingdom)

12471-51

Deep modality association learning using histopathology images and immune cell sequencing data

Author(s): Areej Alsaafin, Morteza Babaie, Univ. of Waterloo (Canada); HR Tizhoosh, Mayo Clinic (United States), Univ. of Waterloo (Canada)

12471-52

Conditional Generative Adversarial Network (cGAN) for Synthesis of Digital Histologic Images from Hyperspectral Images

Author(s): Ling Ma, Jeremy C. Sherey, The Univ. of Texas at Dallas (United States); Doreen Palsgrove, The Univ. of Texas Southwestern Medical Ctr. at Dallas (United States); Baowei Fei, The Univ. of Texas at Dallas (United States)

12471-53

Simple patch-wise transformations serve as a mechanism for slide-level augmentation for multiple instance learning applications

Author(s): Thomas E. Tavolara, Metin N. Gurcan, M. Khalid Khan Niazi, Wake Forest School of Medicine (United States)

12471-54

Integrated image-processing and transcriptomic analysis of cancer-associated fibroblasts (CAFs) in breast cancer subtypes

Author(s): Alison M. Cheung, Hassan Besher, Dan Wang, Kela Liu, Yutaka Amemiya, Jianan Chen, Anne L. Martel, Arun Seth, Martin J. Yaffe, Sunnybrook Research Institute (Canada)

12471-55

Automated identification of cardiomyocyte nuclei in H&E-stained heart tissue with CycleGAN

Author(s): Michael H. Udin, Univ. at Buffalo (United States), Canon Stroke and Vascular Research Ctr. (United States), Roswell Park Comprehensive Cancer Ctr. (United States); Scott T. Doyle, Univ. at Buffalo (United States); Ciprian N. Ionita, Umesh C. Sharma, Univ. at Buffalo (United States), Canon Stroke and Vascular Research Ctr. (United States); Saraswati Pokharel, Univ. at Buffalo (United States), Roswell Park Comprehensive Cancer Ctr. (United States)

12471-56

Effect of color-normalization on deep learning segmentation models for tumor-infiltrating lymphocytes scoring using breast cancer histopathology images

Author(s): Arian Arab, Victor Garcia, Shuyue Guan, Brandon D. Gallas, Berkman Sahiner, Nicholas Petrick, Weijie Chen, U.S. Food and Drug Administration (United States)

12471-57

Automated glioma multiclass tumor classification

Author(s): Monika Pytlarz, Sano Centre for Computational Personalised Medicine (Poland); Kamil Wojnicki, Paulina Pilanc-Kudlek, Bozena Kaminska, Nencki Institute of Experimental Biology PAS (Poland); Alessandro Crimi, Sano Centre for Computational Personalised Medicine (Poland)

12471-58

Role of stain normalization in computational pathology: use case in metastatic tissue classification

Author(s): Paras Goel, BASIS Independent Silicon Valley (United States); Saarthak Kapse, Prateek Prasanna, Stony Brook Univ. (United States)

12471-59

Cell2Voxel: a novel, cell-based 3D tissue model from 2D multiplex tissue scans

Author(s): Laurin Herbsthofer, CBmed GmbH (Austria); Barbara Ehall, Medizinischen Univ. Graz (Austria); Martina Tomberger, Barbara Prietl, Thomas R. Pieber, Pablo López-García, CBmed GmbH (Austria)

12471-60

Space-filling curves for modeling spatial context in transformer-based whole slide image classification

Author(s): Cihan Erkan, Selim Aksoy, Bilkent Univ. (Turkey)

12471-61

A comparison of histopathology imaging comprehension algorithms based on multiple instance learning

Author(s): Adam Saunders, Univ. of Dayton (United States); Sajal Dash, Aristeidis Tsaris, Hong-Jun Yoon, Oak Ridge National Lab. (United States)

12471-62

Multi-scale local explanation approach for image analysis using model-agnostic Explainable Artificial Intelligence (XAI)

Author(s): Hooria Hajiyan, Mehran Ebrahimi, Ontario Tech Univ. (Canada)

12471-63

Fast detection and localization of mitosis using a semi-supervised deep representation

Author(s): Santiago Andrés Castro Duitama, David Edmundo Romo Bucheli, Luis Carlos Guayacán Chaparro, Fabio Martínez, Univ. Industrial de Santander (Colombia)

12471-64

Deep learning segmentation of invasive melanoma

Author(s): Aman Shah, Amal Mehta, Univ. of California, Berkeley (United States); Michael Wang, Neil Neumann, Univ. of California, San Francisco (United States); Avideh Zakhor, Univ. of California, Berkeley (United States); Timothy McCalmont, Univ. of California, San Francisco (United States)

12471-65

Generative Modeling of Histology Tissue Reduces Human Annotation Effort for Segmentation Model Development

Author(s): Nicholas Lucarelli, Univ. of Florida (United States); Brendon Lutnick, Univ. at Buffalo (United States); Pinaki Sarder, Univ. of Florida College of Medicine (United States)

12471-66

Automated Reference Kidney Histomorphometry using a Panoptic Segmentation Neural Network Correlates to Patient Demographics and Creatinine

Author(s): Nicholas Lucarelli, Univ. of Florida (United States); Brandon Ginley, Univ. at Buffalo (United States); Jarcy Zee, Univ. of Pennsylvania (United States); Sanjay Jain, Washington Univ. School of Medicine in St. Louis (United States); Seung Sook Han, Seoul National Univ. College of Medicine (Korea, Republic of); Luis Rodrigues, Univ. de Coimbra (Portugal); Michelle Wong, Kuang Yu Jen, Univ. of California, Davis (United States); Pinaki Sarder, Univ. of Florida College of Medicine (United States)

12471-67

Efficient 3D reconstruction of whole slide images in melanoma

Author(s): Janan Arslan, Mehdi Ounissi, Haocheng Luo, Institut du Cerveau et de la Moelle Épinière (France); Matthieu Lacroix, Pierrick Dupré, Institut de Recherche en Cancérologie de Montpellier (France); Pawan Kumar, Univ. de Montpellier (France); Arran Hodgkinson, Univ. of Exeter (United Kingdom); Sarah Dandou, Univ. de Montpellier (France); Romain Larive, Christine Pignodel, Institut de Recherche en Cancérologie de Montpellier (France); Ovidiu Radulescu, Univ. de Montpellier (France); Daniel Racoceanu, Institut du Cerveau et de la Moelle Épinière (France)

12471-68

A meta-graph approach for analyzing whole slide histopathological images of human brain tissue with Alzheimer's disease biomarkers

Author(s): Gabriel Jimenez Garray, Sorbonne Univ. (France); Pablo Mas, Anuradha Kar, Julien Peyrache, Léa Ingrassia, Susana Boluda, Benoit Delatour, Lev Stimmer, Institut du Cerveau et de la Moelle Épinière (France); Daniel Racoceanu, Sorbonne Univ. (France), Institut du Cerveau et de la Moelle Épinière (France)

12471-69

Multifocal optical metasurfaces for cellular-resolution optical coherence tomography for rapid slide-free histology of human brain and skin samples

Author(s): Jingjing Zhao, Aidan Van Vleck, Yonatan Winetraub, Stanford Univ. (United States); Lin Du, Univ. of California, Berkeley (United States); Yong Han, Tsinghua Univ. (China); Sumaira Aasi, Kavita Yang Sarin, Adam de la Zerda, Stanford Univ. (United States)

12471-70

Deep-supervised adversarial learning-based classification for digital histologic images

Author(s): Zhimin Wang, Zong Fan, Univ. of Illinois (United States); Lulu Sun, Yao Hao, Washington Univ. in St. Louis (United States); Xiaowei Wang, Univ. of Illinois at Chicago (United States); Hua Li, Univ. of Illinois (United States), Washington Univ. in St. Louis (United States)

CONFERENCE 12471

THURSDAY MORNING KEYNOTES

23 February 2023 • 8:30 AM - 10:00 AM | Town & Country A

Session Chairs: Jeffrey H. Siewerdsen, The Univ. of Texas M.D. Anderson Cancer Ctr. (United States), Christian Boehm, ETH Zurich (Switzerland)

8:30 AM: **Welcome and Introduction**

8:35 AM: **Robert F. Wagner Award Finalists Announcements for Conferences 12466 and 12470 Image-Guided Procedures, Robotic Interventions, and Modeling Student Paper and Young Scientist Award Announcements**

12466-508 • 8:40 AM - 9:20 AM | Town & Country A

Seeing and feeling in robot-assisted surgery
(Keynote Presentation)

Allison Okamura, Stanford Univ. (United States)

12470-509 • 9:20 AM - 10:00 AM | Town & Country A

Super-resolution ultrasound through localisation and tracking: technical developments and applications
(Keynote Presentation)

Mengxing Tang, Imperial College London (United Kingdom)

Coffee Break 10:00 AM - 10:30 AM

SESSION 10: FROM CELL DETECTION TO WHOLE-SLIDE IMAGING

23 February 2023 • 10:30 AM - 11:50 AM | Palm 3/4

Session Chair: John E. Tomaszewski, Univ. at Buffalo (United States)

12471-46 • 10:30 AM - 10:50 AM | Palm 3/4

Deep learning-based rapid macrophage cell detection and localization in high-content microscopy screening

Author(s): Kristen Ong, Xuezhu Cai, Vasant Marur, Veronica Soloveva, Uwe Mueller, Antong Chen, Merck & Co., Inc. (United States)

12471-47 • 10:50 AM - 11:10 AM | Palm 3/4

PythoStitcher: an iterative approach for stitching digitized tissue fragments into full resolution whole-mount reconstructions

Author(s): Daan Schouten, Geert Litjens, Radboud Univ. Medical Ctr. (Netherlands)

12471-48 • 11:10 AM - 11:30 AM | Palm 3/4

Investigating the potential of untrained convolutional layers and pruning in computational pathology

Author(s): Taranpreet Rai, Neelkanth Dave, Ambra Morisi, Univ. of Surrey (United Kingdom); Barbara Bacci, Univ. degli Studi di Bologna (Italy); Spencer Angus Thomas, Univ. of Surrey (United Kingdom), National Physical Lab. (United Kingdom); Roberto La Ragione, Kevin Wells, Univ. of Surrey (United Kingdom)

12471-49 • 11:30 AM - 11:50 AM | Palm 3/4

YOLOX-based framework for nuclei detection on whole-slide histopathological RGB an hyperspectral images

Author(s): Carlos Vega, Laura Quintana, Instituto Univ. de Microelectrónica Aplicada (Spain); Samuel Ortega, Instituto Univ. de Microelectrónica Aplicada (Spain), Nofima (Norway); Himar Fabelo, Instituto Univ. de Microelectrónica Aplicada (Spain), Fundación Canaria Instituto de Investigación Sanitaria de Canarias (Spain); Esther Sauras, Hospital de Tortosa Verge de la Cinta (Spain), Univ. Rovira i Virgili (Spain); Noèlia Gallardo, Daniel Mata, Marylene Lejeune, Carlos Lopez, Hospital de Tortosa Verge de la Cinta (Spain); Gustavo M. Callicó, Instituto Univ. de Microelectrónica Aplicada (Spain)

DIGITAL POSTERS

19 February 2023 • 8:00 AM - 8:00 AM | On Demand

The below listed posters are available for online viewing only, from the above listed start date through the end of SPIE Medical Imaging.

12471-25

Enhanced pooling-convolution for pathological image multi-class segmentation

Author(s): Hao Wu, Xinjian Chen, Weifang Zhu, Fei Shi, Dehui Xiang, Soochow Univ. (China)

12471-26

Category feature reconstruction for pathological image segmentation

Author(s): Zhibang Zhou, Xinjian Chen, Weifang Zhu, Fei Shi, Dehui Xiang, Soochow Univ. (China)

12471-27

Accurate segmentation of nuclear instances using a double-stage neural network

Author(s): Kesi Xu, Mostafa Jahanifar, Simon Graham, Nasir Rajpoot, The Univ. of Warwick (United Kingdom)

12471-40

An ensemble approach for histopathological classification of vulvar cancer

Author(s): Raghava Vinaykanth Mushunuri, Fraunhofer MEOS, Erfurt (Germany); Matthias Choschzick, UniversitätsSpital Zürich (Switzerland); Ulf-Dietrich Braumann, Jürgen Hess, Fraunhofer MEOS, Erfurt (Germany)

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NOTES

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