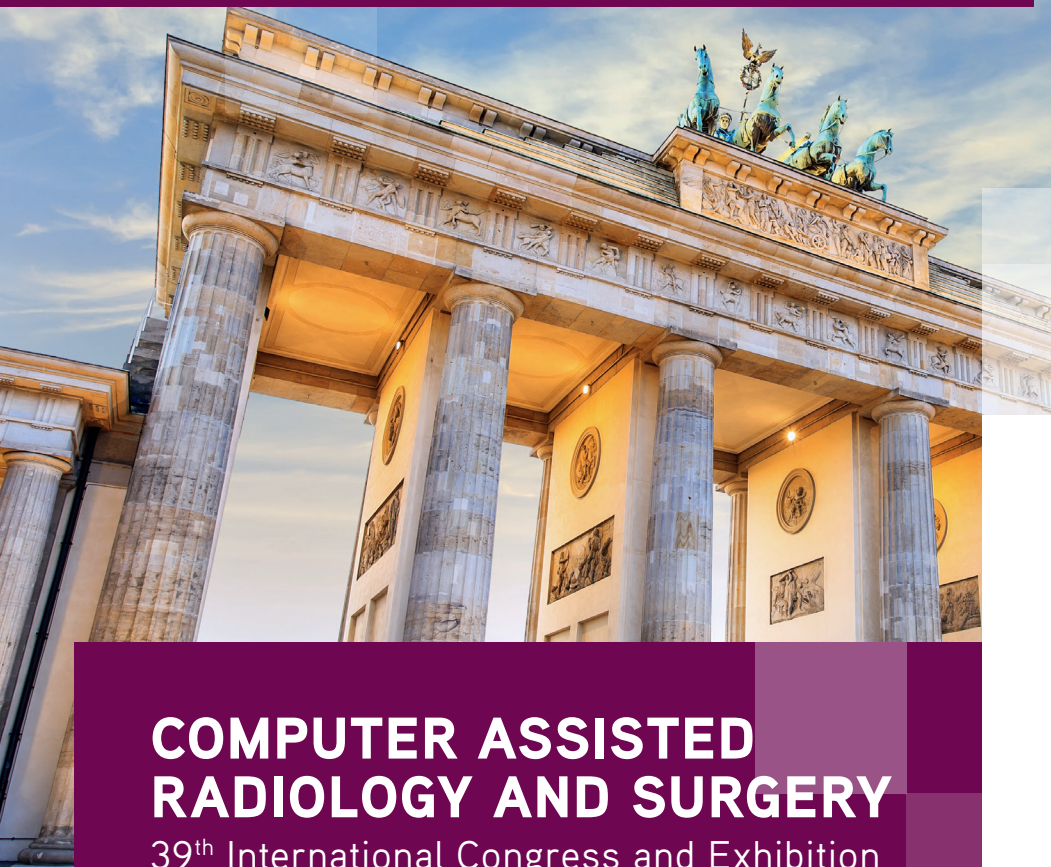




June 17–20, 2025
Berlin, Germany

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Volkmar Falk, MD, PhD (DE)

CARS 2025 Honorary President

Ulrich Bick, MD (DE)

Congress Organizing Committee

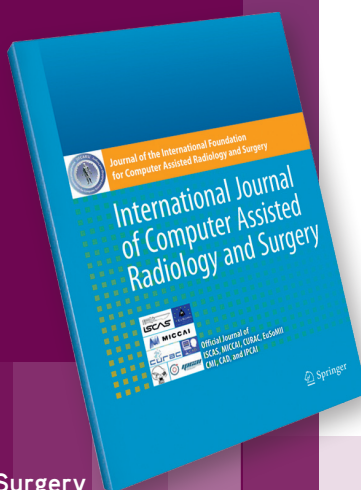
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COMPUTER ASSISTED RADIOLOGY AND SURGERY

39th International Congress and Exhibition

Main Themes

Medical Imaging
Computed Maxillofacial Imaging
Image Processing and Visualization
Multidisciplinary Computational Anatomy
E-Health and IHE
Computer Aided Diagnosis
Computer Assisted Radiation Therapy
Image and Model Guided Therapy
Personalized Medicine
Surgical Navigation
Surgical Robotics and Instrumentation
Surgical Simulation and Education
Computer Assisted Orthopaedic and Spinal Surgery
Computer Assisted Head and Neck, and ENT Surgery
Image Guided Neurosurgery
Minimally Invasive Cardiovascular and Thoracoabdominal Surgery
Information Processing in Computer-Assisted Intervention
Digital Operating Room
Human-Machine Interface
Pathology Informatics
Machine Intelligence
Integrated Patient Care
Human Curated and Model Driven Intelligence
Model Guided Medicine
Innovative Clinical Investigations
Hospital of the Future



CARS 2025 Program Overview

Tuesday, June 17				Wednesday, June 18				Thursday, June 19				Friday, June 20	
Auditorium		B. von Langenbeck		B. von Langenbeck		Auditorium		Auditorium		B. von Langenbeck		Robert Koch	
CARS		IPCAI		CAD-AI		IPCAI		ISCAS		CAR		CARS Clinical Day	
Registration		8:00		CAD-AI Poster Session		8:00		Surgical Navigation & Image-guided Intervention Applications		CAR Poster Session		8:00	
8:15		8:15		Predictive AI		8:15		8:15		8:15		8:15	
8:30		8:30		Machine Learning for Computer Assisted Interventions		8:30		8:30		8:30		8:30	
8:45		8:45				8:45		8:45		8:45			
9:00		9:00				9:00		9:00		9:00			
9:15		9:15				9:15		9:15		9:15			
9:30		9:30		Break		9:30		Break		Break		Break	
9:45		9:45		Break		Break		9:45		Medical Imaging 1		Cardiovascular	
10:00		10:00		Diagnostic AI		10:00		Break		10:00		10:00	
10:15		10:15		Machine Learning for Computer Assisted Interventions		10:15		Surgical Instrumentation and Robotics		10:15		10:15	
10:30		10:30				10:30		10:30		10:30			
10:45		10:45				10:45		10:45		10:45			
11:00		11:00				11:00		11:00		11:00			
11:15		11:15		Break		11:15		ISCAS Poster Session		Break		Human Computer Interaction and Modelling	
11:30		11:30		Break		11:30		11:30		Medical Imaging 2		11:30	
11:45		11:45		CMI		11:45		Interventional Robotics and XR		11:45		11:45	
12:00		12:00		Computed Maxillofacial Imaging		12:00		ISCAS General Assembly		12:00		12:00	
12:15		12:15				12:15		12:15		12:15			
12:30		12:30				12:30		12:30		12:30			
12:45		12:45				12:45		12:45		12:45			
13:00		Break		Break		13:00		Break		Break		CARS Closing	
14:00		IFCARS / DRG / CAD-AI Joint Session on Model Guided Medicine and AI in Radiology		Joint CAR/CAD Session on Segmentation 1		14:00		Algorithms for Image-guided Interventions		Imaging Informatics 1		14:00	
14:15		14:15		Joint CAR/CAD Session on Segmentation 2		14:15		Interventional Robotics and XR		14:15		14:15	
14:30		14:30				14:30		14:30		14:30			
14:45		14:45				14:45		14:45		14:45			
15:00		15:00				15:00		15:00		15:00			
15:15		15:15		Break		15:15		15:15		15:15		15:15	
15:30		15:30				15:30		15:30		15:30			
15:45		15:45				15:45		15:45		15:45			
16:00		16:00				16:00		16:00		16:00			
16:15		16:15		Joint CAR/CAD Session on Segmentation 2		16:15		Surgical Simulation for Training, Education & Evaluation		16:15		16:15	
16:30		16:30		CARS Poster Session		16:30		Surgical Simulation for Training, Education & Evaluation		16:30		16:30	
16:45		16:45				16:45		16:45		16:45			
17:00		17:00				17:00		17:00		17:00			
17:15		17:15				17:15		17:15		17:15			
17:30		17:30		17:30		17:30		WG-24: DICOM in Surgery		17:30		17:30	
17:45		17:45		17:45		17:45		17:45		17:45		17:45	
18:00		18:00		CARS 2025 Opening Session		18:00		18:00		18:00		18:00	
18:15		18:15				18:15		18:15		18:15			
18:30		18:30				18:30		18:30		18:30			
18:45		18:45				18:45		18:45		18:30			
19:00		Reception		19:00		19:00		Social Event		19:00			

This schedule is subject to alteration.

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General Information

Venue

Langenbeck-Virchow-Haus
Luisenstr.58/59
10117 Berlin (Mitte)
Germany

CARS 2025 Congress Dates

Tuesday-Thursday, June 17–19, 2025
08:00h–18:00h
Friday, June 20, 2025
08:00h–13:00h

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Volkmar Falk, MD, PhD
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CARS Organizer

Prof. Heinz U. Lemke, PhD
Professor for Computer Graphics and
Computer Assisted Medicine, a.D.
Technical University of Berlin, DE
International Foundation for CARS

CARS Conference Office

Mrs. Franziska Schweikert
Klettgaustraße 20
79790 Kuessaberg, Germany
Tel.: +49 (0) 7742 922 434
Email: office@cars-int.org
www.cars-int.org

Conference Language

English

Industrial/Poster Exhibition

Tuesday – Thursday
Exhibition Hours: 08:00h–18:00h

Compliance

CARS 2025 has been assessed as compliant with
the MedTech Europe Code of Ethical Business Prac-
tice and EFPIA Code of Practice.

Registration Desk

Tuesday – Thursday, 07:30h–18:30h
Friday, 07:30h–13:30h

CPD Credits

Attendees of CARS 2025 will receive 31 CPD credits
in accordance with the CPD Scheme of the Royal
College of Radiologists.

CARS Journal

Registered CARS 2025 attendees receive full access
to the International Journal of CARS <https://link.springer.com/journal/11548> for one year.

In cooperation with

German Society of Surgery (DGCH)
German Society for Orthopaedics and Trauma (DGOU)
German Roentgen Society (DRG)
SPIE Medical Imaging
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We gratefully acknowledge the support of the
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No liability can be accepted for any errors.
The program is subject to alteration.

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for updated program information.

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Tuesday, June 17, 2025



39th International Congress and Exhibition on Computer Assisted Radiology and Surgery (CARS)

Chairs: Volkmar Falk, MD (DE), Heinz U. Lemke, PhD (DE)

Auditorium

08:30 Welcome to CARS 2025

CARS 2025 President

Volkmar Falk, MD, Deutsches Herzzentrum der Charité, Berlin (DE)

CARS Organizer

Heinz U. Lemke, PhD, International Foundation for CARS, Küssaberg (DE)

08:45–10:15 26th IFCARS / SPIE / ISCAS Joint Workshop on the Digital Operating Room (DOR)

Chairs: Yoshihiro Muragaki, MD (JP), Kevin Cleary, PhD (US)

08:45 Shifting Horizons: The Continuing Advance of Ambulatory Surgery

Invited Lecture: Dirk Wilhelm, L. Bernhard, R. Yang, C. Amato, TUM University Hospital, Munich (DE); Cannondesign, Los Angeles, CA (US) [LE-92]

09:00 Development of a BLE- and Thread-Based RTLS for Enhanced Resource Management in Clinical Environments

M. Voß, S. Gudenkauf, A. Schneider, Jade University of Applied Science, Wilhelmshaven (DE) [LE-60]

09:15 Surgical Video Annotation for Supervised Autonomous Robotic-Assisted Partial Nephrectomy

K. Cleary, M. O'toom, S. Ladstaetter, A. Ghazi, N. Singla, J. Kochai, The Sheikh Zayed Institute for Pediatric Surgical Innovation, Washington, DC; Yarmouk University, Irbid (JO); Johns Hopkins University, Baltimore, MD (US) [LE-80]

09:30 Development and preliminary evaluation of personalized virtual laparoscopic robotic platform (PVLap-Robot) based on patient-specific 3D modeling

Q. Dong, R. Shan, H. Wu, W. Xiu, J. Zhang, X. Hao, N. Xia, X. Chen, C. Bian, F. Wang, The Affiliated Hospital of Qingdao University; Qingdao University; Women and Children's Hospital of Qingdao University; Beihang University (CN) [LE-7]

09:45 Using deep vision-language models improves multi-task performance in assistance applications for endoscopic ENT surgery

R. Bieck, M. Sorge, K. Heuermann, V. Kunz, M. Pirlich, T. Neumuth, University of Leipzig, Faculty of Medicine; Univ. of Leipzig (DE) [LE-25-00019]

10:00 Action Recognition in Medical Environments for Robotic Assistance

S. Stabenow, L. Wagner, A. Knoll, K. Bengler, D. Wilhelm, TUM University Hospital, Munich; Technical University, Garching (DE) [LE-25-00078]

10:15 Break

10:30–12:00 2nd IFCARS / TU Berlin / TU Munich Joint Workshop on Model Guided Medicine, AI and the Search for Truth

Chairs: Dirk Wilhelm, MD (DE), Miguel Á. González Ballester, PhD (ES)

10:30 Explainable AI for Medicine

Invited Speaker: Klaus-Robert Müller, PhD, Technical University Berlin (DE) [IS-127]

10:45 A Robust Sampling Technique for Realistic Distribution Simulation in Federated Learning

R. Hoepp, L. Rist, A. Katzmann, R. Ashok, A. Wimmer, M. Sühling, A. Maier, Friedrich-Alexander-Universität Erlangen-Nürnberg; Siemens Healthineers, Forchheim (DE) [LE-25-00040]

11:00 What are You Looking at? Modality Contribution in Multimodal Medical Deep Learning Methods

C. Gapp, E. Tappeiner, M. Welk, K. Fritscher, E.R. Gizewski, R. Schubert, UMIT TIROL Private University for Health Sciences and Technology GmbH, Hall in Tirol; Medizinische Universität Innsbruck (AT) [LE-25-00034]

11:15 Meta-UNet: Enhancing Segmentation with Multi-Modal Feature Integration and Uncertainty Estimation

S. O K, A. Leilani B Stone, M.A. González Ballester, University of Pompeu Fabra, Barcelona (ES); Massachusetts Institute of Technology MIT, Cambridge (US) [LE-25-00073]

11:30 Evaluating Large Language Models on Hospital Health Data for Automated Emergency Triage

C. Lafuente, M. Rahim, ALHIST-Spain, Valencia (ES); Air Liquide Healthcare, Les Loges-en-Josas (FR) [LE-25-00091]

11:45 Bridging the Gap between Models and Reality – Development of a Research Environment for an Object-oriented Hospital Information System to Integrate Artificial Intelligence and Robotics into Clinical Practice

S. Rashid, L. Bernhard, S. Stabenow, E. Spicker, C. Haid, C. König, H.L. Kramer, S. Pischinger, D. Schade, J. Fottner, D. Wilhelm, M. Berlet, TUM University Hospital, Munich; Technical Univ. Garching (DE) [LE-25-00039]

12:00–13:00 IFCARS / Hahn-Schickard Joint Workshop on Model Guided Medicine and AI

Chairs: Oliver Amft, PhD (DE), Anke Reinschluessel, PhD (DE)

12:00 Use All Data – The Hospital of The Future

Invited Speaker: Frederik Wenz, MD, University Hospital Freiburg (DE) [IS-126]

12:15 RocketGraphs: Fast and reliable creation of medical knowledge graph triples
A. Kumar, D. Singh, M.A. Cypko, O. Amft, Hahn-Schickard-Gesellschaft für angewandte Forschung e. V., Villingen-Schwenningen; University of Freiburg (DE) [LE-25-00097]

12:30 A Guide for the Development of Bayesian Network-Based Clinical Decision Support Systems

A. Kleinau, M. Lombaers, A. Schonaker, J.M.A. Pijnenborg, S. Oeltze-Jafra, Otto-von-Guericke-Universität Magdeburg; Hannover Medical School (DE); Radboud University Medical Center, Nijmegen (NL) [LE-25-00068]

12:45 Large Language Models with Retrieval-Augmented Generation Enhancing Expert Modelling of Bayesian Network for Clinical Decision Support

Invited Lecture: M. A. Cypko, M. A. Salim, A. Kumar, L. Berliner, A. Dietz, M. Stoehr, O. Amft, Hahn-Schickard Gesellschaft für angewandte Forschung e. V., Freiburg; University Hospital Leipzig (DE); Staten Island University Hospital (US) [LE-25-00104]

13:00 Break

Tuesday, June 17, 2025



**39th International Congress and Exhibition
on Computer Assisted Radiology and Surgery (CARS)**
Chairs: Volkmar Falk, MD (DE), Heinz U. Lemke, PhD (DE)

Auditorium

14:00–15:45 IFCARS / DRG / CAD-AI Joint Session on Model Guided Medicine and AI in Radiology

Chairs: Hiroyuki Yoshida, PhD (US), Tobias Penzkofer, MD (DE)

14:00 Model-Guided Medicine and AI in Radiology: Requirements and Clinical Use Cases

Invited Speaker: Tobias Penzkofer, MD, Charité - Universitätsmedizin Berlin (DE) [IS-129]

14:15 Convolutional neural networks for detection of myocardial ischemia in stress cardiac MRI: a feasibility study

I. Vernikouskaya, W. Rottbauer, V. Rasche, D. Buckert, D. Felbel, Ulm University Heart Center (DE) [LE-2]

14:30 Creating a CT yield metric for pulmonary embolisms using an open-source large language model

R. Mitchell, B. Wiseman, H. Li, E. Mason, K. Loneragan, J. Hayward, University of Alberta, Edmonton (CA) [LE-103]

14:45 Predicting the 3D lower limb musculoskeletal shapes from two 2D panoramic ultrasound images using a Statistical Shape Model

N. Müller, Y. Otake, W. Zimin, M. Taniguchi, M. Yagi, N. Ichihashi, M. Soufi, Y. Gu, Y. Masaki, S. Faghihroohi, Y. Sato, Nara Institute of Science and Technology; Kyoto University (JP); Technical University of Munich (DE) [LE-62]

15:00 Development of an efficient organ search method for ultrasound diagnosis robots

S. Takahashi, N. Koizumi, Y. Nishiyama, K. Okuzaki, K. Yoshinaka, R. Tsumura, The University of Electro Communications, Chofu; National Institute of Advanced Industrial Science and Technology, Tsukuba (JP) [LE-49]

15:15 InceptionNeXt-based computer-aided Mayo endoscopic scoring system

Y. Y. Chang, Y. Y. Chen, Y. S. Huang, H. H. Yen, National Taichung University of Science and Technology (TW) [LE-23]

15:30 Multitask deep learning network for lymph node metastasis prediction using breast ultrasound images

R. F. Chang, S. Y. Chen, S. C. Chang, Y. W. Lee, National Taiwan University, Taipei (TW) [LE-22]

15:45 Break

16:00–18:00 IFCARS / DGCH / DGOU Joint Session on Model Guided Medicine and AI in Surgery

Chairs: Thomas Schmitz-Rixen, MD (DE), Heinz U. Lemke, PhD (DE)

16:00 Modelling, AI and clinical decision making in the OR of the future

Invited Speaker: Yoshihiro Muragaki, MD, Kobe University School of Medicine (JP) [IS-128]

16:15 Model-Guided Medicine and AI in Orthopaedic and Trauma Surgery: Requirements and Clinical Use Cases

Invited Speaker: Georg Osterhoff, MD, University Hospital Leipzig (DE) [IS-123]

16:30 Artificial Intelligence-Guided Total Mesorectal Excision: Development of a Deep Learning Model to Identify the Pelvic Fascial Plane Anatomy

N. Kosugi, D. Kitaguchi, Y. Suzuki, M. Fuse, T. Ogane, Y. Kinebuchi, M. Ito, National Cancer Center Hospital East, Chiba; Institute of Science Tokyo (JP) [LE-12]

16:45 AI-Enhanced Predictive Modeling for Treatment Duration and Personalized Treatment Planning of Cleft Lip and Palate Therapy

A. Agaronyan, S. Anwar, H.R. Choo, Children's National Hospital, Washington, DC; Stanford University, Palo Alto, CA (US) [LE-25-00102]

17:00 Extended Reality for the Operating Room

Invited Speaker: Anke Reinschluessel, PhD, University of Konstanz (DE) [IS-136]

17:15 Model Science and Modelling Informatics for a Model Identity Card/ Certificate (MIC) in Radiology and Surgery

H.U. Lemke, IFCARS, Kuessaberg (DE) (138)

17:20 Panel Discussion on Model Guided Medicine

Moderators: Georg Osterhoff, MD (DE), Leo Joskowicz, PhD (IL)

Panelists: Y. Muragaki, T. Schmitz-Rixen, A. Reinschluessel, D. Wilhelm, H. Lemke



CARS 2025 Opening



18:00–19:00 CARS 2025 Opening Session

Chairs: Volkmar Falk, MD, Ulrich Bick, MD, Heinz U. Lemke, PhD (DE)

Modelling, AI and Medical Robotics

Keynote Speaker: Alois C. Knoll, PhD, Technical University Munich (DE)

AI in Radiology: From Idea to Reality

Keynote Speaker: Ulrich Bick, MD, Charité - Universitätsmedizin Berlin (DE)

The role of modelling and AI in cardiovascular surgery

Keynote Speaker: Volkmar Falk, MD, Deutsches Herzzentrum der Charité (DE)

19:15–20:30 Welcome Reception

Tuesday, June 17, 2025

IPCAI 2025 – 16th International Conference on Information Processing in Computer-Assisted Interventions

General Chairs: Stamatia Giannarou, PhD (GB), Orçun Göksel, PhD (SE), Nicolas Padoy, PhD (FR)

Program Chairs: Sophia Bano, PhD (GB), Anirban Mukhopadhyay, PhD (DE), Sara Moccia, PhD (IT)

B. von Langenbeck

09:00–09:15 IPCAI Opening**09:15–10:15 (1S): Surgical Planning, Fusion Imaging, and Navigation (short oral presentations)**

Session Chairs: Elvis C.S. Chen, PhD (CA), Sara Moccia, PhD (IT)

09:15 eNCapsulate: Neural Cellular Automata for Precision Diagnosis on Capsule Endoscopes

H. Krumb, A. Mukhopadhyay [IPCAI-7]

09:20 Stable Distance Regression via Spatial-Frequency State Space Model for Robot-Assisted Endomicroscopy

M. Zhou, C. Xu, S. Giannarou [IPCAI-10]

09:25 Multimodal Imaging Platform for Enhanced Tumor Resection in Neurosurgery: Integrating Hyperspectral and pCLE Technologies

A. Roddan, T. Czempel, C. Xu, H. Xu, A. Weld, G. Anichini, D. Elson, S. Giannarou [IPCAI-11]

09:30 Generating 3D Pseudo-Healthy Knee MR Images to Support Trochleoplasty Planning

M. Wehrli, A. Durrer, P. Friedrich, V. Buchakchyskiy, M. Mumme, E. Li, G. Lehoczy, C.-C. Hasler, P.C. Cattin [IPCAI-12]

09:35 Automatic Multiview Intraoperative Landmark 2D-3D Registration using Semantic Substructure Segmentation

R. Flepp, L. Nissen, B. Sgrist, A. Nieuwland, N. Cavalcanti, P. Furstahl, T. Dreher, L. Calvet [IPCAI-22]

09:40 Interactive Pipeline for Mandible Reconstruction Surgery Planning using Fibula Free Flap

S. Leclerc, B. Jansen van Rensburg, T. de Villèle, M. De Boutray, N. Z., N. Faraj [IPCAI-25]

09:45 FLex: Joint Pose and Dynamic Radiance Fields Optimization for Stereo Endoscopic Videos

F. Stütz, M. A. Karaoglu, F. Tristram, N. Navab, B. Busam, A. Ladikos [IPCAI-37]

09:50 Automatic Calibration of a Multi-Camera System with Limited Overlapping Fields of View for 3D Surgical Scene Reconstruction

T. Flückiger, J. Hein, V. Fischer, P. Furstahl, L. Calvet [IPCAI-64]

09:55 The RoDEM Benchmark: Evaluating the Robustness of Monocular Single-shot Depth Estimation Methods in Minimally-Invasive Surgery

R. Sharifian, N. Rabbani, A. Bartoli [IPCAI-119]

10:00 Uncertainty Quantification in Image-based 2D/3D Registration and Its Relationship with Accuracy

S. Min Cho, A. Do, R. Grupp, M. Armand, R. Taylor, M. Unberath [IPCAI-135]

10:05 Virtual Fluoroscopy for Interventional Guidance using Magnetic Tracking

S. Xing, I. Ahmed-Fazal, U. Pardasani, U. Jarayathne, S. Illsley, A. Fenster, T. Peters, E. Chen [IPCAI-137]

10:10 PDZSeg: Adapting the Foundation Model for Dissection Zone Segmentation with Visual Prompts in Robot-assisted Endoscopic Submucosal Dissection

M. Xu, W. Mo, G. Wang, H. Gao, A. Wang, H. Ren [IPCAI-154]

10:15–10:30 Break**10:30–11:00 (1L): Surgical Planning, Fusion Imaging, and Navigation (audience-voted extended presentations)**

Session Chairs: Caroline Essert, PhD (FR), Matthew J. Clarkson, PhD (GB)

11:00–12:00 (1P): Surgical Planning, Fusion Imaging, and Navigation (posters)**12:00–13:05 (2S): Interventional Image Processing (short oral presentations)**

Session Chairs: Orçun Göksel, PhD (SE), Sophia Bano, PhD (GB)

12:00 Airway Labeling Meets Clinical Applications: Reflecting Topology Consistency and Abnormality via Learnable Attentions

C. Li, M. Zhang, C. Zhang, Y. Gu [IPCAI-19]

12:05 A Multi-Model Deep Learning Approach for the Identification of Coronary Artery Calcifications within 2D Coronary Angiography Images

E. De Rose, C. B. Raggio, A. R. Rasheed, P. Bruno, P. Zaffino, S. De Rosa, F. Calimeri, M. F. Spadea [IPCAI-38]

12:10 perfDSA: Automatic Perfusion Imaging in Cerebral Digital Subtraction Angiography

R. Su, P. van der Sluijs, F.-G. Marc, F. Te Nijenhuis, S. Cornelissen, B. Roozenbeek, W. van Zwam, A. van der Lugt, D. Ruijters, J. Pluim, T. van Walsum [IPCAI-43]

12:15 Acquiring Submillimeter-Accurate Multi-Task Vision Datasets for Computer-Assisted Orthopedic Surgery

E. Most, J. Hein, F. Giraud, N. Cavalcanti, L. Zingg, B. Brument, N. Louman, F. Carrillo, P. Furstahl, L. Calvet [IPCAI-51]

12:20 SHADES: Self-supervised Monocular Depth Estimation Through Non-Lambertian Image Decomposition

R. Daher, F. Vasconcelos, D. Stoyanov [IPCAI-55]

12:25 A Deep Learning Based Approach to Automated Rib Fracture Detection and CWIS Classification

V. Marting, N. Borren, M. van Diepen, E. van Lieshout, M. Wijffels, T. van Walsum [IPCAI-60]

12:30 Catheter Detection and Segmentation in X-ray Images via Multi-task Learning

L. Xi, Y. Ma, E. Koland, S. Howell, A. Rinaldi, K. Rhode [IPCAI-62]

12:35 Uncertainty Estimation for Trust Attribution to Speed of Sound Reconstruction with Variational Networks

S. Laguna, L. Zhang, C. D. Bezek, M. Farkas, D. Schweizer, R. A. Kubik-Huch, O. Göksel [IPCAI-84]

12:40 Parametric-MAA: Fast, Object-Centric Avoidance of Metal Artifacts for Intraoperative CBCT Imaging

M. Rohleder, A. Maier, B. Kreher [IPCAI-95]

12:45 Evaluation of Synthetic Training Data for 3D Intraoral Reconstruction of Cleft Patients from Single Images

L. Lingsens, Y. Lill, P. Nalabothu, B. Benitez, A. Mueller, M. Gross, B. Solenthaler [IPCAI-102]

12:50 SurgIPC: a Convex Image Perspective Correction Method to Boost Surgical Keypoint Matching

R. Sharifian, A. Bartoli [IPCAI-123]

12:55 Dual-Task Meta-Auxiliary Learning In Laparoscopic Cholecystectomy

R. Guo, C. Perreault, B. Mueller, X. Liu, A. Jarc [IPCAI-113]

13:00 ConsisTNet: A Spatio-Temporal Approach for Consistent Anatomical Localization in Endoscopic Pituitary Surgery

Z. Mao, A. Das, D. Khan, S. Williams, J. Hanrahan, D. Stoyanov, H. Marcus, S. Bano [IPCAI-118]

13:05–14:15 Break**14:15–14:45 (2L): Interventional Image Processing (audience-voted extended presentations)**

Session Chairs: Stefanie Speidel, PhD (DE), Danail Stoyanov, PhD (GB)

14:45–15:45 (2P): Interventional Image Processing (posters)**15:45–16:00 Break****16:00–16:45 (3S): Surgical Perception, Activity and Skill Analysis**

Session Chairs: Shlomi Laufer, PhD (IL), Duygu Sarikaya, PhD (FR)

16:00 Surgeons vs. computer vision: A comparative analysis on surgical phase recognition capabilities

M. Mezzina, P. De Backer, T. Vercauteren, M. Blaschko, A. Mottrie, T. Tuytelaars [IPCAI-13]

16:05 SASVi - Segment Any Surgical Video

S. K. R Sivakumar, Y. Frisch, A. Ranem, A. Mukhopadhyay [IPCAI-26]

16:10 Watch and Learn: Leveraging Expert Knowledge and Language for Surgical Video Understanding

D. Gastager, G. Ghazaei, C. Patsch [IPCAI-48]

16:15 Few-shot Text-driven Adaptation of Foundation Models for Surgical Workflow Analysis

T. Chen, K. Yuan, V. Srivastav, N. Navab, N. Padoy [IPCAI-81]

16:20 When do they STOP?: A First Step Towards Automatically Identifying Team Communication in the Operating Room

K. Chen, L. Schewski, V. Srivastav, J. Lavanchy, D. Mutter, G. Beldi, S. Keller, N. Padoy [IPCAI-104]

Tuesday, June 17, 2025

Wednesday, June 18, 2025

IPCAI 2025 – 16th International Conference on Information Processing in Computer-Assisted Interventions

General Chairs: Stamatia Giannarou, PhD (GB), Orçun Göksel, PhD (SE), Nicolas Padoy, PhD (FR)

Program Chairs: Sophia Bano, PhD (GB), Anirban Mukhopadhyay, PhD (DE), Sara Moccia, PhD (IT)

B. von Langenbeck

16:25 Early Operative Difficulty Assessment in Laparoscopic Cholecystectomy via Snapshot-Centric Video Analysis

S. Sharma, M. Vannucci, L. Legori, M. Scaglia, G. Laracca, D. Mutter, S. Alfieri, P. Mascagni, N. Padoy [IPCAI-105]

16:30 Video-based Multi-Target Multi-Camera Tracking for Postoperative Phase Recognition

F. Jurosch, J. Zeller, L. Wagner, E. Özsoy, A. Jell, S. Kolb, D. Wilhelm [IPCAI-120]

16:35 SwinCVS: A Unified Approach to Classifying Critical View of Safety Structures in Laparoscopic Cholecystectomy

F. Nowak, M. Clarkson, B. Davidson, E. Mazomenos [IPCAI-133]

16:40 The Interpretable Surgical Temporal Informer: Explainable Surgical Time Completion Prediction

R. Soberanis-Mukul, R. Shankar, L. Seenivasan, J. Porras, M. Ishii, M. Unberath [IPCAI-145]

16:45–17:15 (3L): Surgical Perception, Activity and Skill Analysis (audience-voted extended presentations)

Session Chairs: Arnaud Huauilmé, PhD (FR), Maria F. Spadea, PhD (DE)

17:15–18:00 (3P): Surgical Perception, Activity and Skill Analysis (posters)**18:00–19:00 CARS 2025 Opening Session**

Wednesday, June 18, 2025

Auditorium

08:45–09:45 (4S): Machine Learning for Computer Assisted Interventions (short oral presentations)

Session Chairs: Sharib Ali, PhD (GB), Purang Abolmaesumi, PhD (CA)

08:45 Diffusion-Driven Distillation and Contrastive Semantic Segmentation for Class-Incremental Learning of Laparoscopic Images

X. Zhao, Y. Hayashi, M. Oda, T. Kitasaka, K. Mori [IPCAI-5]

08:50 Two-stream MeshCNN for key anatomical segmentation on the liver surface

X. Zhang, S. Ali, M. Han, Y. Kang, X. Wang, L. Zhang [IPCAI-9]

08:55 Training-free Temporal Object Tracking in Surgical Videos

S. Koley, A. Kadkhodamohammadi, S. Barbarisi, D. Stoyanov, I. Luengo [IPCAI-16]

09:00 SurGrid: Controllable Surgical Simulation via Scene Graph to Image Diffusion

Y. Frisch, S. K.R Sivakumar, Ç. Köksal, E. Böhm, F. Wagner, A. Gericke, G. Ghazaei, A. Mukhopadhyay [IPCAI-29]

09:05 Contrastive prototype federated learning against noisy labels in fetal standard plane detection

M. C. Fiorentino, G. Migliorelli, F. P. Villani, E. Frontoni, S. Moccia [IPCAI-36]

09:10 DivGI: Delve into Digestive Endoscopy Image Classification

Q. He, S. Bano, D. Stoyanov, S. Zuo [IPCAI-45]

09:15 KEVS: Enhancing Segmentation of Visceral Adipose Tissue in Pre-Cystectomy CT with Gaussian Kernel Density Estimation

T. Boucher, E. Mazomenos, N. Tetlow, A. Fung, P. Arina, A. Dewar, S. Kerneis, J. Whittle [IPCAI-76]

09:20 Automatic trajectory planning for stereotactic radiofrequency ablation in non-discrete search space

A. Lukes, W. Freysinger, R. Bale [IPCAI-96]

09:25 Semantic hyperspectral image synthesis for cross-modality knowledge transfer in surgical data science

V. T. Ba, M. Huebner, A. Bin Qasim, M. Rees, J. Sellner, S. Seidlitz, B. Özdemir, A. Studier-Fischer, F. Nickel, L. Ayala, L. Maier-Hein [IPCAI-100]

09:30 Shortcut Learning Leads to Sex Bias in Deep Learning Models for Photoacoustic Tomography

M. Knopp, C. Bender, N. Holzwarth, J. Kempf, M. Caranovic, Y. Li, F. Knieling, W. Lang, A. Seitel, U. Rother, L. Maier-Hein, K. Dreher [IPCAI-106]

Auditorium

09:35 Adaptive Sensitivity-Fisher Regularization for Heterogeneous Transfer Learning of Vascular Segmentation in Laparoscopic Videos

X. Zhao, Y. Hayashi, M. Oda, T. Kitasaka, K. Misawa, K. Mori [IPCAI-111]

09:40 FACT: Foundation Model for Assessing Cancer Tissue Margins with Mass Spectrometry

M. Farahmand, A. Jamzad, F. Fooladgar, L. Connolly, M. Kaufmann, K. Y. Mi Ren, J. Rudan, D. McKay, G. Fichtinger, P. Mousavi [IPCAI-146]

10:00–10:30 (4L): Machine Learning for Computer Assisted Interventions (audience-voted extended presentations)

Session Chairs: Duygu Sarikaya, PhD (FR), Leo Joskowicz, PhD (IL)

10:30–11:30 (4P): Machine Learning for Computer Assisted Interventions (posters)

11:30–11:45 Break

11:45–12:45 (5S): Interventional Robotics and XR (short oral presentations)

Session Chairs: Maria F. Spadea, PhD (DE), Vinkle Srivastav (FR)

11:45 Robotic CBCT Meets Robotic Ultrasound

F. Li, Y. Bi, D. Huang, Z. Jiang, N. Navab [IPCAI-14]

11:50 A-MFST: Adaptive Multi-Flow Sparse Tracker for Real-Time Tissue Tracking Under Occlusion

Y. Chen, Z. Wu, A. Schmidt, S. Salcudean [IPCAI-20]

11:55 A Cooperatively Controlled Robotic System with Active Constraints for Enhancing Precision in Bilateral Sagittal Split Osteotomy

J. Haworth, M. Sahu, K. Zhu, J. Hammond, H. Ishida, A. Munawar, R. Yang, R. Taylor [IPCAI-28]

12:00 Intelligent Control of Robotic X-ray Devices using a Language-promptable Digital Twin

B. Killeen, A. Suresh, C. Gomez, B. Inigo, C. Bailey, M. Unberath [IPCAI-42]

12:05 Reinforcement Learning for Safe Autonomous Two Device Navigation of Cerebral Vessels in Mechanical Thrombectomy

H. Robertshaw, B. Jackson, H. Sadati, J. Wang, L. Karstensen, A. Granados, T. Booth [IPCAI-70]

12:10 Benchmarking Reinforcement Learning Algorithms for Autonomous Mechanical Thrombectomy

F. Moosa, H. Robertshaw, L. Karstensen, T. Booth, A. Granados [IPCAI-75]

12:15 An augmented reality overlay for navigated prostatectomy using fiducial-free 2D-3D registration

J. Bender, J. Kwe, B. Hoeh, K. Boehm, I. Platzek, A. Borkowetz, S. Speidel, M. Pfeiffer [IPCAI-78]

12:20 Deep Hashing for Global Registration of Preoperative CT and Video Images for Laparoscopic Liver Surgery

H. Zhang, B. Davidson, M. Clarkson, S. Bulathsinhala, J. Ramalhinho [IPCAI-93]

12:25 MIS-NeRF: Neural Radiance Fields in Minimally-Invasive Surgery

S. B. Khojasteh, D. Fuentes, D. Pizarro, Y. Espinel Lopez, A. Bartoli [IPCAI-114]

12:30 HEAT: High-Efficiency simulation for thermal Ablation Therapy

J. Mehtali, J. Verde, C. Essert [IPCAI-124]

12:35 Touching the tumor boundary: A pilot study on ultrasound based virtual fixtures for breast conserving surgery

L. Connolly, T. Ungl, A. Munawar, A. Deguet, C. Yeung, R. Taylor, P. Mousavi, G. Fichtinger, K. Hashtrudi-Zaad [IPCAI-132]

12:40 Super-resolution for Localizing Electrode grids as Small, Deformable Objects during Epilepsy Surgery Using Augmented Reality Headsets

H. Salim, A. Thabit, T. van Walsum, S. Hoogteijling, M. A. van 't Klooster, M. Zijlmans, M. Benmahdjoub [IPCAI-138]

12:45–14:15 Break

Wednesday, June 18, 2025

**IPCAI 2025 – 16th International Conference on Information Processing in Computer-Assisted Interventions****General Chairs:** Stamatia Giannarou, PhD (GB), Orçun Göksel, PhD (SE), Nicolas Padoy, PhD (FR)**Program Chairs:** Sophia Bano, PhD (GB), Anirban Mukhopadhyay, PhD (DE), Sara Moccia, PhD (IT)**Auditorium****14:15–14:45 (5L): Interventional Robotics and XR (audience-voted extended presentations)****Session Chairs:** Nassir Navab, PhD (DE), Duygu Sarikaya, PhD (FR)**14:45–15:45 (5P): Interventional Robotics and XR (posters)****15:45–16:00 Break****16:00–16:40 (6S): Long Abstracts (oral pitches)****Session Chairs:** Pieter De Backer (BE), Evangelos B. Mazomenos, PhD (GB)**16:00 Improving Automatic Cerebral 3D-2D CTA-DSA Registration**

C. Downs, M. van der Sluijs, S. Cornelissen, F. te Nijenhuis, R. van Oostenbrugge, W. van Zwam, V. Gopalakrishnan, X. Zhang, R. Su, T. van Walsum [IPCAI-156]

16:03 Manual Registration in AR-Assisted Surgical Navigation: A Comparative Evaluation

J. Tang, A. Thabit, M. Benmahdjoub, R. Marroquim, T. van Walsum [IPCAI-157]

16:06 Augmented Reality System in Endoscopic Pituitary Surgery with Automatic Registration

A. Enkaoua, J. Ramalhinho, M. Islam, H. Marcus, M. Clarkson [IPCAI-158]

16:09 Surgical Neural Radiance Fields from One Image

A. Neri, M. Fehrentz, V. Penza, L. S. Mattos, N. Haoachine [IPCAI-159]

16:12 DualVision ArthroNav: Investigating Opportunities to Enhance Localization and Reconstruction in Image-based Arthroscopy Navigation via External Cameras

H. Shu, L. Seenivasan, M. Liu, Y. Hwang, Y.-C. Ku, J. Knopf, A. Martin-Gomez, M. Armand, M. Unberath [IPCAI-161]

16:15 Grip Force Changes During FLS Peg Transfer Task

S. Niv, S. Laufer [IPCAI-162]

16:18 Open-source synthetic organ simulation pipeline for laparoscopic navigation applications

M. Pfeiffer, B. Güttner, P. Liu, E. Tagliabue, P. Fiorini, S. Speidel [IPCAI-163]

16:21 3D Reconstruction in Endonasal Pituitary Surgery

L. Mennillo, D. Lee, E. Burrows, J.-E. Chen, D. Khan, J. Starup-Hansen, D. Stoyanov, M. J. Clarkson, H. J. Marcus, S. Bano [IPCAI-167]

16:24 Improving Neck Ultrasound Image Retrieval using Intra-Sweep Representation Learning

W. Chen, A. Schmidt, E. Prisman, S. Salcudean [IPCAI-169]

16:27 Automatic Ultrasound Images Alignment for Diagnosis of Pediatric Distal Forearm Fractures

P. Liu, Y. Hu, J. Schultz, J. Pohl, G. Fitze, S. Speidel, M. Pfeiffer [IPCAI-172]

16:30 Multi-Perspective Tracking of Surgical Tools

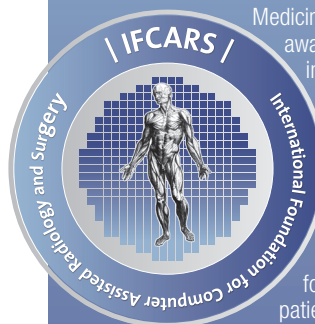
C. Nwoye, N. Padoy [IPCAI-165]

16:33 Wireless electromagnetic tracking sensors for image-guided interventions

D. Crowley, P. Cantillon-Murphy [IPCAI-166]

16:36 SlicerROS2: A Free Open-Source Platform for Seamless Integration of Medical Image Computing and Robotic

L. Connolly, A. Kumar, K. K. Mehta, L. Al-Zogbi, P. Kazanzides, P. Mousavi, G. Fichtinger, A. Krieger, J. Tokuda, R. H. Taylor, S. Leonard, A. Deguet [IPCAI-171]

16:40–17:20 (6P): Long Abstracts (posters)**17:20–17:30 Awards and End of Session****International Foundation for Computer Assisted Radiology and Surgery – IFCARS**www.ifcars.org

Medicine is undergoing a historic transition, moving away from a trial-and-error model of care, towards individualized treatment strategies based on patient-specific knowledge management of disease and treatment. Not only the biomedical systems sciences, mathematics, medical imaging and medical informatics but also the discipline of computer assisted radiology and surgery are enablers of this new paradigm. They provide the methods and tools for knowledge management and specifically for a patient-specific medicine.

Important aspects of these dramatically evolving methodologies and tools are:

1. Modelling of human organ systems, pathologies and clinical processes from scientific based evidence, medical guidelines and data mining.
2. Analysis and adaption of models from data and information gathered from specific patients to generate knowledge models of patient-specific situations and appropriate treatment processes.
3. Improved accuracy of diagnosis and optimal therapy through simulation as well as knowledge and decision management.
4. Higher quality of therapy by means of real time integration of information in patient-specific models and therapeutic processes.
5. Validation processes of clinical decisions on patient-specific and population levels as well as appropriate representations in repositories.

Patients, physicians and the health care systems are the beneficiaries of this development through improved quality of health care at a socially acceptable cost. IFCARS with its associated CARS congress and journals are key actors in this transitional process.

The Foundation aims at supporting all measures promoting this development, in particular, the creation and communication of information in the field of computer assisted medicine and the study of its medical, social and ethical effects on our society.

The purpose of the Foundation is particularly realised by

- Events of all kinds, e.g. congresses, seminars, think tank focus discussions, training and further education as well as the preparation of appropriate publications.
- Support of interdisciplinary and international activities relating to the research and development of innovative public health concepts, particularly through system development and subsequent implementation and evaluation.
- Promotion of national and international cooperation in science and medicine, particularly in research, development and educational activities.

Key parts of the CARS congress which address advanced methods and tools for a patient specific medicine have been initiated by IFCARS. Their inclusion in the International Journal of CARS is also promoted by IFCARS. In order to ascertain a scientific-based foundation for a modern medicine and specifically for computer assisted radiology and surgery, IFCARS is actively pursuing research and developing projects with other institutions with similar aims.

In order to accelerate the transfer of research results of CARS into clinical practice, IFCARS is also taking a leading role as an enabler of ICT supported clinical trials and studies.

Finally, to increase awareness and the application of these new possibilities of a computer assisted medicine in a socially responsible way, IFCARS will establish a membership and award system to promote this historic transition of medicine.



International Society for Computer Aided Surgery

President: Kensaku Mori (Japan)

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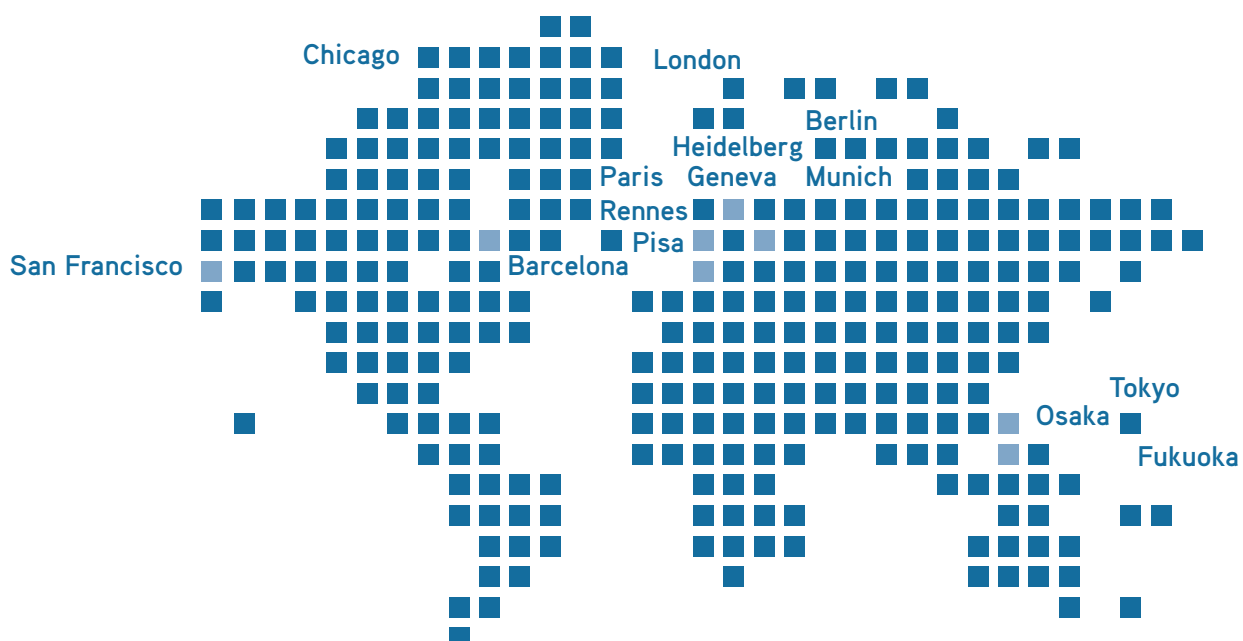
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40 Years of CARS | 1985–2025



Wednesday, June 18, 2025



27th International Conference on Computer-Aided Diagnosis and Artificial Intelligence (CAD-AI)

Chairman: Hiroyuki Yoshida, PhD (US)

B. von Langenbeck

08:00–08:15 CAD-AI Poster Session

Session Chairs: Paulo Mazzoncini Azevedo-Marques, PhD (BR), Hiroyuki Yoshida, PhD (US)

08:00 2.5-dimensional multi-task learning for accurate detection of adrenal metastasis on abdominal FDG-PET/CT images

M. Nemoto, K. Yoshida, H. Kaida, Y. Kimura, T. Nagaoka, K. Mikami, T. Yamada, K. Hanaoka, T. Tsuchitani, K. Kitajima, K. Ishii, Kindai University, Wakayama; Hyogo Medical University Hospital, Wakayama; Hyogo Medical University Hospital, Nishinomiya (JP) [PO-121]

08:03 CNN-based computer-aided diagnosis for tuberculosis, COVID-19, and interstitial lung diseases in chest X-ray.

P. Azevedo-Marques, M. Koenigkam-Santos, L. L. de Lima, M. Koenigkam-Santos, University of São Paulo, Ribeirão Preto Medical School (BR) [PO-45]

08:06 Development of a CAD-based teaching material creation system for cell screening skills training

T. Miyazawa, A. Sugawara, Y. Takatori, K. Abe, M. Sato, N. Abe, Y. Nishimura, R. Furuta, Kanagawa Institute of Technology; Kitasato University (JP) [PO-51]

08:09 Automated platform for clinical and technical evaluation of artificial intelligence in radiology.

A. Kovalchuk, Y. Vasilev, A. Vladymyrsky, O. Omelyanskaya, A. Ponomarenko, E. Akhmad, V. Zinchenko, E. Savkina, T. Bobrovskaya, Y. Kirpichev, A. Surkov, K. Arzamov, State Budget-Funded Health Care Institution, Moscow (RU) [PO-56]

08:12 Development and validation of an AI agent system for clinical medical image analysis with chain workflow architecture

C. Bian, Q. Dong, The Affiliated Hospital of Qingdao University (CN) [PO-30]

08:15–09:45 Predictive AI

Session Chairs: Shouhei Hanaoka, MD, PhD (JP), Ines Machado, PhD (GB)

08:15 A feasibility study on the usage of vision transformer for predicting tumor resectability in ovarian cancer patients from diagnostic CT images

F. Fati, M. Rosanu, A. Traversa, L. De Vitis, G. Schivardi, L. Ribero, F. Multinu, R. Veraldi, C. Cosentino, M. F. Spadea, P. Zaffino, E. De Momi, Istituto Europeo di Oncologia, Rapallo; Università degli Studi Magna Graecia, Catanzaro (IT) [LE-86]

08:30 Analyzing pediatric forearm X-rays for fracture analysis using machine learning

S.M. Anwar, V. Khanh Lam, A. Parida, S. Dance, S. Tabaie, K.C. Cleary, Children's National Hospital, Washington, DC; Nationwide Children's National Hospital, Ohio (US) [LE-25-00106]

08:45 Glioblastoma Survival Prediction Through MRI and Clinical Data Integration with Transfer Learning

A. Marasi, D. Milesi, D. Aquino, F. Doniselli, R. Pascuzzo, M. Grisoli, A. Redaelli, E. De Momi, Politecnico di Milano; Fondazione IRCCS Istituto Neurologico Carlo Besta, Milano (IT) [LE-25-00119]

09:00 Automated stratification of polyps into C-RADS categories for computer-aided detection in laxative-free CT colonography

J. Näppi, T. Hironaka, M. Okamoto, H. Yoshida, Massachusetts General Hospital, Boston, MA (US); Boston Medical Sciences, Inc., Tokyo (JP) [LE-29]

09:15 Prognostic Potential Of Radiomics Evaluation Of Lung Artery Thrombus For Pulmonary Embolism Patients

L. Ehrhardt, P. Fiedler, A. Surov, S. Saalfeld, Technische Universität Ilmenau; Otto-von-Guericke-Universität Magdeburg; Johannes Wesling Klinikum Minden (DE) [LE-25-00060]

09:30 Homology-feature-assisted quantification of fibrotic lesions in computed tomography images: A proof of concept for CT image feature-based prediction for gene-expression-distribution

K. Doi, H. Numasaki, Y. Anetani, Y. Natsume-Kitatani, National Institute of Biomedical Innovation Health and Nutrition, Osaka; Kansai Medical University, Osaka (JP) [LE-25-00052]

09:45 Break

10:00–11:30 Diagnostic AI

Session Chairs: Janne J. Näppi, PhD (US), Rie Tachibana, PhD (JP)

10:00 AI-Based CADv for Invasiveness Assessment in Adenocarcinoma: Influence of Radiation Dose and Reconstruction Methods on Ultra-High-Resolution CT

Y. Ohno, T. Ueda, M. Nomura, T. Yoshikawa, D. Takenaka, M. Endo, Y. Ozawa, Fujita Health University School of Medicine, Toyoake (JP) [LE-19]

10:15 Rheumatoid Arthritis Detection from Hand X-Ray Images Using ResNet and Spatial Attention Mechanisms

Y. Heng, K. Mori, C. Wang, M. Oda, K. Katayama, Nagoya University; Katayama Orthopedic Rheumatology Clinic, Hokkaido (JP) [LE-25-00121]

10:30 Synthetic Data Generation with Worley-Perlin Diffusion for Robust Subarachnoid Hemorrhage Detection in Imbalanced CT Datasets

Z. Lu, T. Hu, M. Oda, Y. Fuse, R. Saito, M. Jinzaki, K. Mori, Nagoya University; Keio University School of Medicine, Tokyo (JP) [LE-25-00134]

10:45 Unsupervised transformer-based electronic cleansing for CT colonography

R. Tachibana, J. Näppi, T. Hironaka, M. Okamoto, H. Yoshida, Muroran Institute of Technology; Boston Medical Sciences, Inc. (JP); Massachusetts General Hospital, Boston (US) [LE-115]

11:00 Maximizing performance for each site in automated detection of brain metastasis on contrast-enhanced T1-weight MRI using federated learning

A. Yamada, S. Hanaoka, T. Takenaga, T. Yoshikawa, T. Nakaguchi, Y. Nomura, Chiba University; The University of Tokyo Hospital (JP) [LE-55]

11:15 Pre-Trained Vision Transformer and Quantum Pyramidal Circuits for Biomedical Image Analysis

X. Font Aragones, M. A. González Ballester, TecnoCampus; Universitat Pompeu Fabra, Barcelona (ES) [LE-25-00122]

11:30 Break



31st Computed Maxillofacial Imaging Congress

Chair: Christos Angelopoulos, DDS (US)

B. von Langenbeck

11:45–12:51 Computed Maxillofacial Imaging

Session Chair: Christos Angelopoulos, DDS (US), Hans Meine, PhD (DE)

11:45 Determination of Kennedy's classification in panoramic x-rays using mask R-CNN

H. Meine, M.C. Metzger, P. Weingart, J. Wüster, R. Schmelzeisen, A. Rörich, J. Georgii, L. Brandenburg, Fraunhofer MEVIS, Bremen; Albert-Ludwigs University; University Medical Center, Freiburg (DE) [LE-25-00032]

12:00 Boolean Operation Method Considering Numerical Errors: A Comparative Study on Complete Denture Design

J. Park, G. Choi, D. Myung, J. Choi, Imageworks, Gangnam-gu (KR) [LE-72]

12:15 Automatic surgical planning based on point cloud filtering and geometric constraints for temporomandibular joint prosthesis implantation

X. Chen, X. Fan, X. Zhang, J. Zhao, D. He, Shanghai Jiao Tong University (CN) [LE-25-00113]

12:30 Large Language Model-Driven Robotic System for Craniomaxillofacial Surgery

S. Zhang, L. Jiang, J. Wu, X. Chen, Shanghai Ninth People's Hospital; Fudan University, Shanghai (CN) [LE-28]

12:45 Evaluation of Segmentation of Maxillary Sinus and Classification of Mucosal Thickening in Panoramic Radiograph Using Deep Learning Models

B. D. Lee, H. G. Yeom, Y. C. Park, S. J. Lee, Wonkwang University College of Dentistry; Jeonbuk National University (KR) [PO-75]

12:48 A novel portable augmented reality surgical navigation system for maxillofacial surgery: technique and accuracy study

B. Li, Shanghai Ninth People's Hospital (CN) [PO-5]

12:51 Break

Wednesday, June 18, 2025



27th International Conference on Computer-Aided Diagnosis and Artificial Intelligence (CAD-AI)

Chairman: Hiroyuki Yoshida, PhD (US)



39th International Congress and Exhibition on Computer Assisted Radiology (CAR)

Chair: Ulrich Bick, MD (DE)

B. von Langenbeck

14:00–15:45 Joint CAR/CAD Session on Segmentation 1

Session Chairs: Akinobu Shimizu, PhD (JP), Ina Vernikouskaya, PhD (DE)

14:00 Deep Learning-Based Segmentation of Acute Pulmonary Embolism in Cardiac CT images

E. Amini, G. Hille, J. Hürtgen, A. Surov, S. Saalfeld, University Hospital Schleswig-Holstein, Kiel; Johannes Wesling Klinikum Minden (DE) [LE-25-00099]

14:15 Improved Muscle and Fat Segmentation for Body Composition Measures on Quantitative CT

J. Liu, Praveen Thoppey Srinivasan Balamuralikrishna, S.Tan, P. Mukherjee, Tejas Sudharshan Mathai, P.J. Pickhardt, R.M. Summers, National Institute of Health Clinical Center, Bethesda, MD; University of Wisconsin School of Medicine and Public Health, Madison, WI (US) [LE-24-01216]

14:30 Assessing Segmentation Tools for Muscle and Fat on Abdominal CT Scans in presence of Ascites

J. Liu, B. Hou, T. Sudharshan Mathai, T. Tong Wei, M. Lubner, P. Pickhardt, R.M. Summers, Z. Lu, National Institute of Health Clinical Center, Bethesda, MD; University of Wisconsin School of Medicine and Public Health, Madison, WI (US) [LE-25-00021]

14:45 Using sparse annotations to train a generic CTA vessel segmentation model

F. Thielke, S. Wichelmann, Fraunhofer-Institut für Digitale Medizin, Bremen (DE) [LE-65]
15:00 Towards universal HR-pQCT segmentation: 3DBayesian U-Net CNN transfers semantic knowledge to imaging sites not in training set
J. Bereiter-Payr, G. Degenhart, B. Dejakum, M. Knoflach, R. Bale, Medical University of Innsbruck; Landeskrankenhaus Innsbruck (AT) [LE-25-00069]

15:15 Multi-task deep learning for automatic image segmentation and treatment response prediction in metastatic ovarian cancer

I. Prata Machado, B. Drury, Z. Gao, T. Buddenkotte, G. Mahani, G. Funingana, M. Reinus, C. McCague, R. Woitek, A. Sahdev, E. Sala, J. Brenton, University of Cambridge; Addenbrooke's Hospital, Cambridge; Barts Health NHS Trust, London (GB); Danube Private University (AT); Jung Diagnostics GmbH, Hamburg (DE) [LE-25-00088]

15:30 Sequence-aware MTANN for Semantic Segmentation of Rare Cancer in Multisequence MRI with Small-data Training

K. Suzuki, H. Zhang, Y. Yang, Z. Jin, F. Nakatani, M. Miyake, Institute of Science Tokyo, Yokohama; National Cancer Center Hospital, Tokyo (JP) [LE-111]

15:45 Break

16:00–17:45 Joint CAR/CAD Session on Segmentation 2

Session Chairs: Kenji Suzuki, PhD (JP), Ruey-Feng Chang, PhD (TW)

16:00 Hypothalamus and Intracranial Volume Segmentation at the Group Level by Use of a Gradio-CNN Framework

I. Vernikouskaya, V. Rasche, J. Kassubek, H.-P. Müller, Ulm University Medical Center (DE) [LE-24-01202]

16:15 Machine Learning-Driven Prediction of Pancreatic Abnormalities using Image-Derived Data Combined with Amylase and HbA1c Biomarkers

M. A. Alam, S. Hanaoka, T. Yoshikawa, O. Abe, The University of Tokyo (JP) [LE-74]

16:30 Semi-automatic segmentation of elongated interventional instruments for online calibration of C-arm imaging system

N. Chabi, A. Illanes, O. Beuing, D. Behme, B. Preim, S. Saalfeld, Otto-von-Guericke-University Magdeburg; AMEOS Hospital Bernburg (DE) [LE-25-00023]

16:45 Binary Classification of Liver Sides Roughness in Ultrasound Images Using Transformer and CNN Models with StyleGAN3 Data Augmentation

I. Fujii, N. Koizumi, N. Matsumoto, Y. Nishiyama, R. Kasagi, P. Chen, M. Ogawa, The University of Electro-Communications; Nihon University School of Medicine, Tokyo (JP) [LE-20]

17:00 Classification of Irregularities in Hepatic Venous Vessel Walls Using Ultrasound Images

K. Asahi, N. Koizumi, N. Matsumoto, I. Fujii, M. Ogawa, The University of Electro-Communications, Chofu; Nihon University, Tokyo (JP) [LE-50]

17:15 Exploring Interaction Paradigms for Segmenting Medical Images in Virtual Reality

M. Kersten-Oertel, Z. Jones, S. Drouin, Concordia University; École de Technologie Supérieure, Montreal, QC (CA) [LE-25-00108]

17:30 Streamlining the Annotation Process by Radiologists of Volumetric Medical Images with Few-Shot Learning

L. Joskowicz, A. Ryabsev, R. Lederman, J. Sosna, The Hebrew University of Jerusalem; Hadassah Hebrew University Medical Center (IL) [LE-25-00066]

17:45–18:00 CARS Poster Session

Session Chairs: Mario A. Cypko, PhD (DE), Francesca Fati, MSc (IT)

17:45 Quality assurance system for chest x-ray examinations

A. Borisov, S. Semenov, Y. Kirpichev, K. Arzamasov, O. Omelyanskaya, A. Vladzimirsky, Y. Vasilev, SBIH Scientific and Practical Clinical Center for Diagnostics and Telemedicine Technologies of the Moscow Department of Health, Moscow (RU) [PO-24-01254]

17:48 Investigation of User Interface Optimization in a Virtual Desktop Radiological Interpretation Environment Using a Spatial Computer

A. Yamada, Shinshu University School of Medicine, Matsumoto (JP) [PO-120]

17:51 Semi-supervised learning-based forearm vein detection and reconstruction for venipuncture navigation

D. Jeung, S. Shim, J. Seo, Korea Institute of Machinery and Materials, Daegu (KR) [PO-46]

17:54 3D reconstruction-assisted robotic system for remote nasal endoscopic diagnostics

S. Shim, D. Jeung, J. M. Shin, T. H. Kim, J. Seo, Korea Institute of Machinery and Materials, Daegu; Korea University, Seoul (KR) [PO-47]

17:57 Predicting debulking surgery outcome of ovarian cancer patients by using 3D deep learning algorithm

R. Veraldi, M. Rosanu, L. De Vitis, G. Schivardi, R. Ribero, G. D. Aletti, F. Multinu, A. Traversa, F. Fati, C. Cosentino, M. F. Spadea, E. De Momi, P. Zaffino, Magna Graecia University of Catanzaro; European Institute; (IT) Karlsruhe Institute of Technology (DE) [PO-67]

18:00 Quantification of regional variation in left ventricular motion using fiducial markers with application to cardiac radioablation therapy

M. Rettmann, D. Marringa, T. Koya, T. Hirao, Z. Stottler, J. Kruse, K. Merrell, D. Shumway, A. Deisher, K. Siontis, Mayo Clinic, Rochester MN; University of Illinois, Urbana (US) [PO-66]

Thursday, June 19, 2025



28th Annual Conference of the International Society for Computer Aided Surgery

General Chairs: Kensaku Mori, PhD (JP), Cristian Linte, PhD (US)

Auditorium

08:00–10:00 Surgical Navigation & Image-guided Intervention Applications

Session Chairs: Kensaku Mori, PhD (JP), Marta Kersten-Oertel, PhD (CA)

08:00 Research and development of computer-assisted surgery system and its application in precision pediatric oncological surgery

Q. Dong, R. Shan, W. Xiu, J. Zhang, B. Wei, N. Xia, X. Hao, C. Bian, Y. Chen, F. Wang, The Affiliated Hospital of Qingdao University; Qingdao University; Women and Children's Hospital of Qingdao University; Hisense Medical Equipment Co. (CN) [LE-6]

08:15 A modular AI-supported dosimetry system for real-time scatter radiation monitoring and visualization in hybrid operating rooms

P. Schüle, N. Rettig, L. Marxen, N. Rathmann, S. Diehl, M. Vetter, Mannheim University of Applied Sciences; University Heidelberg, Mannheim (DE) [LE-35]

08:30 Recurrent Multi-view 6DoF Pose Estimation for Marker-less Surgical Tool Tracking

J. Roskamp, N. Agethen, T.L. Koller, J. Klein, G. Zachmann, University of Bremen; Fraunhofer-Institut für Digitale Medizin MEVIS, Bremen (DE) [LE-25-00067]

08:45 Benchmarking NounsNav: Quantifying the Spatial Accuracy and Clinical Performance of an Affordable, Open-Source Neuronavigation System

C. Barr, C. Galvin, P. Juvekar, E. Torio, S. Horvath, S. Sadler, A. Li, R. Bardsley, T. Kapur, S. Pieper, S. Pujol, S. Frisken, G. Fichtinger, A. Golby, Queen's University, Kingston, Ontario (CA); Brigham and Women's Hospital; Design for Complex Systems, Inc., LLC, Boston, MA; Isomics, Inc., Cambridge, MA; Kitware Inc., Clifton Park, NY (US) [LE-25-00110]

09:00 Enhanced laparoscopic ultrasound image augmentation with hybrid electromagnetic-ArUco tracking

D. Crowley, L. Lobo, A. Halpern, T. Nguyen, W. Plishker, T.D. Kane, R. Shekhar, Children's National Hospital, Washington, DC (US) [LE-81]

09:15 Development of an AR and AI-Powered Surgical Microscope for Ophthalmic Surgical Navigation

P. Tu, C. Zheng, X. Chen, Shanghai Jiao Tong University (CN) [LE-85]

09:30 Real-time augmented reality guidance for cochlear implant electrode array insertion

S. Abraham, R. Labadie, J. Noble, Vanderbilt University, Nashville, TN; Medical University of South Carolina, Charleston (US) [LE-104]

09:45 Anomaly Detection using Intraoperative iKnife Data: A Comparative Analysis in Breast Cancer Surgery

O. Radcliffe, L. Connolly, A. Jamzad, M. Kaufmann, S. Merchant, J. Engel, R. Walker, S. Varma, G. Fichtinger, J. Rudan, P. Mousavi, Queen's University, Kingston, ON (CA) [LE-25-00112]

10:00 Break

10:15–11:15 Surgical Instrumentation and Robotics

Session Chairs: Kevin Cleary, PhD (US), Jana Steger, PhD (DE)

10:15 Additively manufactured hydraulic actuation units for flexible endoscopic manipulators

J. Steger, G. Nobile, D. Wilhelm, TUM University Hospital, Munich (DE) [LE-98]

10:30 Experimental Evaluation of Virtual Needle Insertion Framework with Enhanced Haptic Feedback

M. Selim, L. Eisenburger, T. Dijkhuis, M. Van Dam, A. Broersen, D. Dresscher, J. Dijkstra, M. Abayazid, University of Twente, Enschede; Leiden University Medical Center (NL) [LE-25-00105]

10:45 Semi-automatic puncture robotic system based on real-time multi-modal image fusion: preclinical evaluation

K. Chen, B. Zhang, Y. Yao, B. Wu, Q. Li, Z. Zhang, P. Fan, W. Wang, M. Lin, X. Jiang, S. Sugano, M.G. Fujie, M. Kuang, Wuxi AMIT Intelligent Medical Technology Co., Ltd., KYOSETO Co., Ltd.; Sun Yat-Sen University, The First Affiliated Hospital, Guangzhou; Tianjin University Central Hospital, Tianjin (CN); Waseda University, Tokyo (JP) [LE-25-00046]

11:00 Implementation of ChatGPT in Path Planning for Robot-assisted Ablation Surgery

H. C. Zuo, S. H. Shen, N. W. Chang, C. Y. Huang, C. Y. Chung, P. L. Yen, National Taiwan University; Taipei Veterans General Hospital (TW) [LE-107]

11:15–11:50 ISCAS Poster Session

Session Chairs: Caroline Essert, PhD (FR), Munenori Uemura, PhD (JP)

11:15 Ear endoscope manipulator with pivot movable mechanism for robot-assisted transcanal endoscopic ear surgery

M. Takamatsu, M. Izawa, T. Kawai, T. Fujita, N. Uehara, T. Yamashita, H. Suzuki, A. Nishikawa, Osaka Institute of Technology; Kobe University; Chuo University; The University of Osaka (JP) [PO-41]

11:18 Feasibility study on predicting complications in robotic surgery using surgical log data obtained from a surgical robot

M. Uemura, K. Chinzei, H. Ueki, T. Urade, T. Yamaguchi, K. Nanchi, Y. Chihara, S. Ozawa, T. Fukumoto, Y. Muragaki, Kobe University, Graduate School of Medicine (JP) [PO-48]

11:21 Adaptive illumination calibration for multispectral snapshot camera

E. Wisotzky, K. Ton-That, A. Hilsman, P. Eisert, Fraunhofer Heinrich-Hertz-Institute, Berlin (DE) [PO-59]

11:24 Novel preprocessing pipeline for cervical spine X-ray analysis: leveraging classification performance of predicting cervical canal stenosis

W. Rhee, S. C. Park, H. Kim, B. S. Chang, S. Y. Chang, University of Illinois at Urbana-Champaign; Seoul National University (KR) [PO-70]

11:27 Design of a high-fidelity thorax phantom for robotic transthoracic echocardiography

M. Van den Bogaert, K. Van Assche, T. Verkinderen, M. Ourak, E. Vander Poorten, KU Leuven (BE) [PO-87]

11:30 Automated Pedicle Screw Insertion Planning for spinal Fusion in thoracic and lumbar Vertebrae

A. Röhrich, F. Thielke, T. Pätz, Fraunhofer Institute for Digital Medicine, Bremen (DE) [PO-112]

11:33 Evaluating virtual reality as a tool for improving surgical planning in spinal tumors

T.N.H. Nantenaina, A. Titov, S.-J. Yuh, S. Drouin, École de Technologie Supérieure, Montreal, QC (CA) [PO-25-00043]

11:36 Real Time 3D US-CT Fusion-based Semi-automatic Puncture Robot System: Clinical Evaluation

M. Nakayama, B. Zhang, R. Kuromatsu, M. Nakano, Y. Noda, T. Kawaguchi, Q. Li, Y. Maekawa, M.G. Fujie, S. Sugano, Waseda University; Kurume University, Fukuoka; KYOSETO Co., Ltd., Tokyo (JP) [PO-25-00047]

11:39 A novel point cloud registration method for liver minimally invasive surgical robot based on feature regions

B. Zhang, K. Chen, M. Nakayama, Y. Yao, B. Wu, Q. Li, Z. Zhang, P. Fan, Y. Li, M.G. Fujie, S. Sugano, Waseda University, Tokyo; KYOSETO Co., Ltd., Tokyo; Shijiazhuang People's Hospital, Shijiazhuang; Wuxi AMIT Intelligent Medical Technology Co. Ltd, Wuxi (JP) [PO-25-00049]

11:42 Surgical ToolTip Localization via Concentric Nested Square Markers and Depth-RGB Multi-Coordinate Fusion

F. Jia, D. Zhang, T. Zhang, A. Elazab, C. Li, H. Luo, Chinese Academy of Sciences, Shenzhen; Shenzhen Institutes of Advanced Technology; Fudan University, Shanghai; Guilin University of Electronic Technology; (CN) [PO-25-00051]

11:45 Optimization of an artificial neural network for predicting stress in robot-assisted laparoscopic surgery based on EDA sensor data.

D. Caballero Jorna, M.J. Pérez-Salazar, J.A. Sánchez-Margallo, F.M. Sánchez-Margallo, Centro de Cirugía de Mínima Invasión Jesús Uson, Cáceres (ES) [PO-25-00080]

12:00 ISCAS General Assembly

13:00 Break

Thursday, June 19, 2025



28th Annual Conference of the International Society for Computer Aided Surgery

General Chairs: Kensaku Mori, PhD (JP), Cristian Linte, PhD (US)

Auditorium

14:00–16:00 Algorithms for Image-guided Interventions

Session Chairs: Cristian A. Linte, PhD (US), Sarah Frisken, PhD (US)

14:00 Classification of speech impairments during awake craniotomy: a comparative study of wav2vec2- and whisper-based models

I. Maoudj, A. Kuwano, C. Panhéleux, Y. Kubota, T. Kawamata, Y. Muragaki, K. Masamune, R. Seizeur, G. Dardenne, M. Tamura, Univ. of Western Bretagne; University Hospital of Brest (FR), Tokyo Women's Medical University Hospital (JP) [LE-58]

14:15 Prediction of the pre-morbid glenoid shape using deep learning for automatic bone loss calculation

S. Kamradt, A. R. Oswald, H. Hess, A. C. Ruckli, J. T. Rojas, M. Jaxsens, A. Lädermann, M. A. Zumstein, O. M. Schär, K. Gerber, Inselspital University Hospital; University of Bern; Clinica Santa Maria; Kantonsspital St Gallen; Hôpital de La Tour; Sonnenhof Orthopaedics (CH) [LE-61]

14:30 Automatic segmentation of complex tibial fracture fragments from CT images

R. D. Dirnberger, A. C. Ruckli, H. Hess, L. Zamboni, I. Bau, T. Zumbunn, S. Hess, E. F. Liechti, N. Gerber, Inselspital University Hospital, University of Bern; CustomSurg AG, Zürich (CH) [LE-63]

14:45 Optimizing Registration Uncertainty Visualization to Support Intraoperative Decision-making During Brain Tumor Resection

S. Frisken, M. Geshvadi, R. Dorent, C. Galvin, N. Haouchine, T. Kapur, S. Pieper, M. Vangel, W. Wells, A. Golby, D. Haehn, Harvard Medical School; Brigham and Women's Hospital Boston, MA; Isomics, Inc., Cambridge, MA (US) [LE-25-00098]

15:00 Establishment and application prospect of human digital liver database platform

B. Wei, Q. Dong, J. Wang, N. Xia, W. Xiu, Y. Chen, X. Yang, The Affiliated Hospital of Qingdao University; Qingdao University; Hisense Medical Equipment Co. (CN) [LE-8]

15:15 Enhancing Generalization in Zero-Shot Multi-Label Endoscopic Instrument Classification

R. Maerkl, T. Rueckert, D. Rauber, C. Palm, Regensburg University of Applied Sciences (DE) [LE-25-00033]

15:30 A Reproducible Framework for Synthetic Data Generation and Instance Segmentation in Robotic Suturing

P. Leoncini, F. Marzola, M. Pescio, M. Casadio, A. Arezzo, G. Dagnino, Università degli Studi di Torino; Università degli Studi di Genova (IT); University of the West of England, Bristol (GB) [LE-25-00084]

15:45 Automated multimodal segmentation and tracking for AR-guided open liver surgery using scene-aware self-prompting

S. Khajarian, M. Schwimmbeck, K. Holzapfel, J. Schmidt, C. Auer, S. Remmele, O. Amft, Landshut University of Applied Sciences; Hahn-Schickard-Gesellschaft für angewandte Forschung e. V., Freiburg; LAKUMED Hospital Landshut-Achdorf (DE) [LE-25-00037]

16:00 Break

16:15–18:00 Surgical Simulation for Training, Education & Evaluation

Session Chairs: Kensaku Mori, PhD (JP), Pierre Jannin, PhD (FR)

16:15 Evaluation of augmented reality guidance for glenoid pin placement in total shoulder arthroplasty

T. Frantz, F. van Gestel, P. Slagmolen, J. Duerinck, T. Scheerlinck, J. Vandemeulebroucke, Vrije Universiteit Brussel; Materialise NV, Leuven; UZ Brussel: Universitair Ziekenhuis Brussel (BE) [LE-25-00061]

16:30 Simulation of the surface image reconstruction from the acquired image by the Integral Videography-based stereo endoscope

N. Kobayashi, Y. Takei, K. Kuwana, Tokyo Denki University (JP) [LE-119]

16:45 NeuroLens: Enhancing Surgical Education with Real-time Organ Localization using Natural Language Commands

N. Matasyoh, D. Delev, W. Masalha, F. Mathis-Ullrich, R. Zeineldin, Friedrich-Alexander-Univ. Erlangen-Nürnberg; University Hospital Erlangen (DE) [LE-25-00114]

17:00 Simulation of Multi-organ Deformation Using Octree Cube Structures and Textured Transparent Particles for Laparoscopic Cholecystectomy

R. Miyazaki, Y. Hayashi, M. Oda, K. Misawa, K. Mori, Nagoya University; Aichi Cancer Center (JP) [LE-78]

17:15 Expert-level AI assessment of intraoperative performance during microscopic surgeries

R. Yilmaz, A. Mun, E. Torres, H. Syed, K. Cleary, R. F. Keating, D. Donoho, Children's National Medical Center, Washington, DC; (US); McGill University, Montreal, QC (CA) [LE-88]

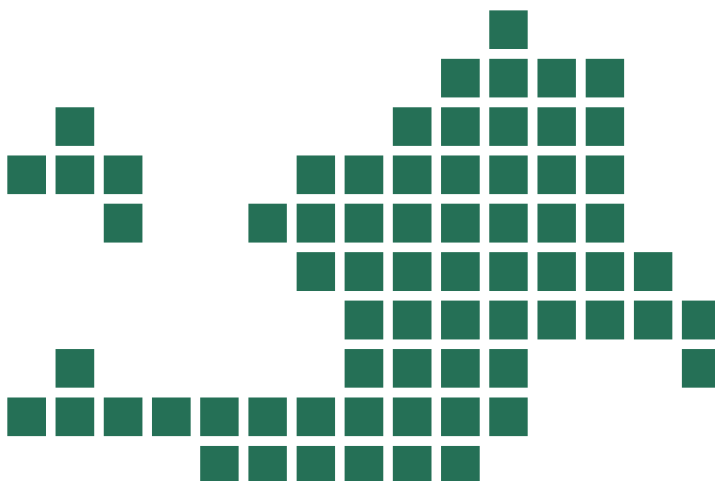
17:30 Automated skill evaluation method for robotic surgery kinematic data utilizing segmented convolution neural network

Y. Feng, Y. Heng, Y. Hayashi, M. Oda, T. Kitasaka, A. Yasui, C. Shiroda, H. Uchida, K. Mori, Nagoya University; Aichi Institute of Technology, Toyota (JP) [LE-116]

17:45 Comparison of the application value of virtual simulation surgery, 3D visualization, and 2D CT images in difficult pediatric liver tumors

W. Xiu, Q. Dong, R. Shan, S. Jia, J. Zhang, C. Bian, F. Wang, The Affiliated Hospital of Qingdao University; Qingdao University; Women and Children's Hospital of Qingdao University (CN) [LE-9]

18:00 End of Session



Thursday, June 19, 2025



**39th International Congress and Exhibition
on Computer Assisted Radiology (CAR)**

Chair: Ulrich Bick, MD (DE)

B. von Langenbeck

08:00–09:45 CAR Poster Session

Session Chairs: Michael H. Friebe, PhD (DE), Masahiro Oda, PhD (JP)

08:00 Left-Right Relationship-Aware 3D Volume Classification Method

M. Oda, Y. Hayashi, Y. Otake, M. Hashimoto, T. Akashi, S. Aoki, K. Mori, Nagoya University; Juntendo University Hospital; Keio University School of Medicine Tokyo (JP) [PO-25-00071]

08:03 Comparison of LLaVA 1.5 and 1.6 for Radiology Report Generation: The Impact of LoRA Fine-Tuning on Medical Image Analysis

H. Matsuo, T. Matsunaga, M. Nishio, T. Murakami, Kobe University Hospital (JP) [PO-71]

08:06 Evaluation of the Effectiveness of Large Language Models in Automatic Structuring of Chest X-ray Radiology Reports

T. Matsunaga, M. Nishio, H. Matsuo, T. Murakami, Kobe University Graduate School of Medicine (JP) [PO-95]

08:09 Preliminary Study on Report Generation of Thrombosis Formation Study from Confocal Laser Scanning Microscopy Images

M. Oda, C. Wang, S. Kawamura, T. Takebe, K. Mori, Nagoya University; Institute of Science Tokyo (JP); Cincinnati Children's Hospital Medical Center (US) [PO-117]

08:12 Fine-tuning Foundation Monocular Relative Depth Estimation Model to Metric Depth Estimation Model by Low-rank Adaptation for Colonoscopic Video

M. Oda, J. Qiu, Y. Hayashi, T. Kitasaka, K. Mori, Nagoya University (JP) [PO-118]

08:15 Automated overview of complete endoscopies with unsupervised learned descriptors

O.L. Barbed, P. Azagra, J. Plo, A.C. Murillo, University of Zaragoza (ES) [PO-25-00050]

08:18 Automatic Choroid Segmentation and Thickness Measurement in Optical Coherence Tomography Using Deep Learning

Y. L. Huang, K. X. Hou, C. Y. Lin, Y. X. Shen, C. J. Chang, Tunghai University; Taichung Veterans General Hospital (TW) [PO-11]

08:21 Quantitative myocardial SPECT imaging without μ -maps using convolutional neural networks

S. Inaba, K. Ogawa, Hosei University, Graduate School of Science and Engineering, Tokyo (JP) [PO-25]

08:24 Feasibility of using Segment Anything Model 2-generated labels for mediastinal lymph node segmentation model development

D. Matsumoto, T. Kikuchi, K. Yamamoto, R. Oishi, Y. Kondo, Y. Yamagishi, S. Hanaoka, T. Yoshikawa, T. Hu, M. Oda, K. Mori, Y. Nomura, T. Kohro, H. Mori, Jichi Medical University Hospital, Tochigi; The University of Tokyo Hospital (JP) [PO-37]

08:27 Comparison of approximation methods for the detection probability of the ML-EM method in pinhole SPECT imaging

Y. Nawano, K. Ogawa, Hosei University, Graduate School of Science and Engineering, Tokyo (JP) [PO-21]

08:30 Inferior Vena Cava Diameter Measurement System Using Ultrasound and Deep Learning

N. Umetsu, H. Noro, P. Chen, Y. Nishiyama, R. Kasagi, H. Tsukihara, N. Koizumi, The University of Electro-Communications (JP) [PO-105]

08:33 Automated vision-based assistance tools in bronchoscopy: stenosis severity estimation

C. Tomasini, J. Rodriguez-Puigvert, D. Polanco, M. Viñuales, L. Riazuelo, A.C. Murillo, University of Zaragoza; Hospital Universitario Miguel Servet, Zaragoza (ES) [PO-25-00044]

08:36 Mask SAM 3D for coronary artery and plaque segmentation in CCTA Images

C. Tian, R. Tu, L. Wang, Y. Deng, C. Chen, W. Si, S. Wang, Shenzhen Institute of Advanced Technology, Chinese Academy of Sciences; Shanxi Cardiovascular Hospital; The University of Hong Kong (CN) [PO-25-00029]

08:39 The necessity of parallel needle placement for tumor ablation using irreversible electroporation: a myth?

F. Joeres, T. Paetz, C. Hansen, A. Schenk, Otto-von-Guericke-University, Magdeburg; Fraunhofer Institute for Digital Medicine, Bremen (DE) [PO-91]

08:42 Stability of the centerline lengths between external carotid artery bifurcations despite changes in head and neck posture or catheter insertion and removal

T. Ohya, I. Sakuma, M. Yukiya, E. Kobayashi, K. Mitsudo, Yokohama City University; The University of Tokyo; Tokyo Women's Medical University (JP) [PO-25-00022]

08:45 Vibroacoustic Signatures: Proof of Concept for simple Material Characterization during Needle Interventions

K. Steeg, W. Serwatka, D. Rzepka, H. Oran, O. Berke Özdi, K. Heryan, G.A. Krombach, M.H. Friebe, University Hospital Gießen; University Hospitals Giessen and Marburg Campus Giessen; Otto-von-Guericke-University, Magdeburg (DE); AGH University of Science and Technology, Kraków (PL) [PO-25-00042]

08:48 Precise IQ Engine for MRI: Comparison of Scan Time and Image Quality with Capabilities with Conventional Protocol with and without ZIP

Y. Ohno, T. Ueda, M. Nomura, T. Yoshikawa, D. Takenaka, Y. Ozawa, Fujita Health University School of Medicine, Toyoake (JP) [PO-17]

08:51 CG and DL Reconstructions for UTE-MRI: Capability for Acquisition Time Reduction without Reducing Image Quality and Nodule Detection Performance

Y. Ohno, T. Ueda, M. Nomura, T. Yoshikawa, D. Takenaka, Y. Ozawa, Fujita Health University School of Medicine, Toyoake (JP) [PO-15]

08:54 Image Quality and Dose Reduction Using an Additional Silver Filter in Chest CT

A. Urikura, T. Ishihara, H. Nagasawa, T. Yoshida, National Cancer Center Hospital, Tokyo; Shizuoka Cancer Center (JP) [PO-36]

08:57 Comparative Analysis of ADC Measurements: Evaluating Sequence-Dependent Variations in Brain DWI

T. Yoshida, A. Urikura, K. Nakashima, M. Endo, Shizuoka Cancer Centre; National Cancer Center Hospital, Tokyo (JP) [PO-31]

09:00 Automated MRI-TRUS fusion imaging using the prostate edge

A. Endo, N. Koizumi, Y. Nishiyama, P. Chen, G. Karakida, M. Annju, S. Shoji, The University of Electro Communications, Chofu (JP) [PO-52]

09:03 Separation of projection images in a multiplexed pinhole SPECT system using convolutional neural networks

T. Akatsuka, K. Ogawa, Hosei University, Tokyo (JP) [PO-32]

09:06 Development of a radiomics prediction model for preoperative prediction of circumferential resection margin in rectal cancer using MRI images

Y. Lu, Y. Ju, L. Zheng, G. Tian, The Affiliated Hospital of Qingdao University; Shandong University (CN) [PO-39]

09:09 Anhedonia in patients with schizophrenia and their first-degree relatives

X. Chen, X. Zhang, C. Yan, N. Xia, Y. Wang, K. Marcus, Qingdao University; Institute for Digital Medicine and Computer-assisted Surgery; The Affiliated Hospital of Qingdao University; East China Normal University; China University (CN), University of Nottingham (GB) [PO-53]

09:12 RANSAC-based Global 3DUS to CT/MR Rigid Registration Using Liver Surface and Vessels

R. Igarashi, T. Goto, I. Cho, K. Numata, Y. Ishino, Y. Kitamura, M. Noguchi, T. Hirai, K. Waki, Fujifilm Corporation, Tokyo; Yokohama City University Medical Center (JP) [PO-25-00064]

09:15 Benchmarking commercial depth sensors for intraoperative markerless registration in neurosurgery applications

M. Villa, J. Sancho, G. Rosa-Olmeda, M. Chavarrias, E. Juarez, C. Sanz, Universidad Politécnica de Madrid (ES) [PO-25-00076]

09:18 BronchoGAN: Anatomically consistent and domain-agnostic image-to-image translation for video bronchoscopy

M. Himstedt, A. Soliman, R. Keuth, Lübeck University of Applied Sciences; University of Lübeck (DE) [PO-25-00100]

09:21 Annotation-Efficient Deep Learning Detection and Measurement of Mediastinal Lymph Nodes in CT

L. Joskowicz, A. Olesinski, R. Lederman, Y. Azraq, J. Sosna, The Hebrew University of Jerusalem; Hadassah Medical Center; Hadassah Medical University (IL) [PO-25-00065]

09:24 The assessment of elite hockey performance following orthopaedic surgical procedures using advanced sports statistics

E. Hayes, B. Matache, M. Pickell, The Ottawa Hospital (CA) [PO-114]

09:27 Integrating FHIR-driven radiology infrastructure with cutting-edge Virtual Reality for enhanced clinical workflows and education

V. D. Vu, J. Hof, H. Repp, G. Luijten, J. Egger, B. Puladi, P.J. Kuhl, T. Bley, G.A. Krombach, Justus-Liebig-Universität Giessen; Uniklinik RWTH Aachen; Univ. Hospital Essen; Univ. Hospital Würzburg; Univ. Hospitals Giessen and Marburg, Giessen (DE) [PO-25-00038]

09:30 MosMedMaterial database: Tissue-mimicking materials for imaging phantoms

O. Vlasova, M. Kodenko, M. Cherkasskaya, A. Nasibullina, Y. Bulgakova, P. Gelezhe, O. Omelyanskaya, A. Vladimirovsky, Y. Vasilev, Research and Practical Clinical Center of Diagnostics and Telemedicine Technologies, Moscow (RU) [PO-34]

09:33 Break

Thursday, June 19, 2025



39th International Congress and Exhibition on Computer Assisted Radiology (CAR)

Chair: Ulrich Bick, MD (DE)

B. von Langenbeck

9:45–11:15 Medical Imaging 1

Session Chairs: Stephen J. Riederer, PhD (US), Akinobu Shimizu, PhD (JP)

09:45 Generating Pre-Contrast T1-Weighted MRI with a cGAN Model Enhanced by a Distance-Based Loss Function
S. Hadad, O. Genc, B. Liu, P. Chunduru, A. Molinaro, J. Lupo, University of California, San Francisco (US) [LE-102]

10:00 Less-invasive estimation of intracranial meningioma consistency using 3 Tesla diffusion-weighted imaging
K. Miyoshi, T. Wada, I. Uwano, M. Sasaki, H. Saura, S. Fujiwara, K. Ogasawara, Y. Akamatsu, Iwate Medical University, Iidaori (JP) [LE-101]

10:15 Res-ViT based MRI-endoscopy fusion model for predicting treatment response to neoadjuvant chemoradiotherapy in rectal cancer: A multicenter study
Y. Lu, J. Zhang, R. Liu, D. Hao, G. Tian, Q. Wang, B. Feng, W. Tong, Y. Yang, G. Wang, The Affiliated Hospital of Qingdao University; Shandong University; The First Hospital of Jilin University; Ruijin Hospital; Army Medical Center; Beijing Friendship Hospital; The Second Hospital of Hebei Medical University (CN) [LE-38]

10:30 Colonoscope Motion Estimation with a pretrained Depth-Estimation Model Toward Colon 3D Reconstruction
N. Onozaka, H. Itoh, M. Oda, M. Misawa, Y. Mori, S. E. Kudo, K. Mori, Nagoya University; Fukuoka University; Showa University Northern Yokohama Hospital (JP); University of Oslo (NO) [LE-113]

10:45 Vision-based Navigation and Depth Estimation for Various Endoscopic Scenes
X. Chen, S. Zhang, Fudan University, Shanghai; Shanghai Ninth People's Hospital (CN) [LE-83]

11:00 A robust Training-free Approach to Airway Orifice Segmentation in Video Bronchoscopy
M. Himstedt, A. Soliman, R. Keuth, University of Lübeck; Lübeck University of Applied Sciences (DE) [LE-27]

11:15 Break

11:30–12:45 Medical Imaging 2

Session Chairs: Tobias Penzkofer, MD (DE), Osman Ratib, MD (CH)

11:30 Predicting Peritoneal Recurrence and Hyperthermic Intraperitoneal Chemotherapy Benefits in T4 Gastric Cancer Patients via Quantitative Imaging
W. Xie, Y. Lu, D. Wang, X. Zhou, Z. Jiang, The Affiliated Hospital of Qingdao University (CN) [LE-57]

11:45 Multivariate unsupervised analysis of fetal MRI: characterization of healthy and diseased patient profiles
G. Martí-Juan, I. Valenzuela Silva, E. Eixarch, O. Cámara, M. Á. González Ballester, G. Piella, Universitat Pompeu Fabra, Barcelona; Hospital Clínic and Hospital Sant Joan de Déu (ES) [LE-77]

12:00 Classification of esophageal cancer by using hyperspectral data
M. Maktabi, C. Hain, H. Köhler, B. Huber, B. Jansen-Winkel, I. Gockel, University of Leipzig; University Hospital of Leipzig; SRH Klinikum Burgenlandkreis GmbH, Naumburg (DE) [LE-25-00090]

12:15 Intraoperative imaging with multiphoton microscopy – study results of section-free histologic investigations in just a few minutes
M. Strauch, J. P. Kolb, M. Homs Soler, Á. Vega Pérez, N. Khosravi, J. Kren, N. Keric, K. C. Honselmann, T. Keck, F. Hemptenmacher, M. Banys-Plauchowski, A. Rody, M. C. Roesch, A. Merseburger, L. Ha-Wissel, Histolution GmbH, Lübeck; Universitätsklinikum Schleswig-Holstein (DE) [LE-43]

12:30 A Mobile Robotic Approach to Autonomous Surface Scanning in Legal Medicine
S. Grube, S. Latus, M. Fischer, V. Raudonis, A. Heinemann, B. Ondruschka, A. Schlaefler, Hamburg University of Technology; University Medical Center Hamburg-Eppendorf (DE); Kaunas University of Technology (LT) [LE-25-00072]

12:45 Break

14:00–15:30 Imaging Informatics 1

Session Chairs: Miguel Á. González Ballester, PhD (ES), Valentin Comte, PhD (BE)

14:00 Automated findings report generation using VLM from longitudinal 3D CT volumes
K. Nguyen, C. Wang, M. Oda, K. Mori, Nagoya University (JP) [LE-26]

14:15 Automated generation of Japanese medical reports from 3D abdominal CT volumes
Z. Shi, Y. Heng, C. Wang, M. Oda, K. Mori, Nagoya University (JP) [LE-73]

14:30 PACS-integrated AI computer vision system to establish brain tissue iron levels in pediatrics
H. Zamanian, E. Doyle, M. Borzage, B. Tamrazi, J. Wood, M. Nelson, S. Erberich, Children's Hospital Los Angeles; University of Southern California, Los Angeles, CA (US) [LE-110]

14:45 Landmark-free Automatic Digital Twin Registration in Robot-assisted Partial Nephrectomy using a Generic End-to-end Model
A. Bartoli, K. Chandelon, A. Pitout, M. Souchaud, J. Desternes, G. Margue, J. Peyras, N. Bourdel, J.-C. Bernhard, Université Clermont Auvergne, Clermont-Ferrand; SURGAR Surgical Augmented Reality, Clermont-Ferrand (FR); Bordeaux University Hospital, Bordeaux (FR) [LE-25-00118]

15:00 Preoperative and intraoperative liver point cloud registration based on multi-feature fusion and hyperbolic embedding
X. Yang, B. He, Y. Dai, F. Jia, L. Wang, H. Luo, Shenzhen Institutes of Advanced Technology; Chinese Academy of Sciences, Shenzhen; Northeastern University, Shenyang (CN) [LE-25-00045]

15:15 Developing Brain Biomechanics: Deep Learning Registration of Neonatal MRI with Strain-Based Regularization
V. Comte, G. Piella, M. Ceresa, M. A. Gonzalez Ballester, Joint Research Centre, Geel (BE) [LE-84]

15:30 Break

15:45–17:30 Imaging Informatics 2

Session Chairs: Alexander Meyer, MD (DE), Elizabeth Beckmann, BSc (GB)

15:45 Radiological Data Processing System: Lifecycle Management and Annotation
T. Bobrovskaya, Y. Vasilev, A. Vladzimirsky, O. Omelyanskaya, P. Kosov, E. Krylova, A. Ponomarenko, T. Burtsev, E. Savkina, M. Kodenko, S. Kasimov, K. Medvedev, A. Kovalchuk, V. Zinchenko, D. Rumyantsev, V. Kazarinova, S. Semenov, K. Arzamasov, Moscow Research and Practical Clinical Center of Diagnostics and Telemedicine Technologies, Moscow (RU) [LE-24-01251]

16:00 Interactive AI Annotation of Medical Images in a Virtual Reality Environment
L. Orsmaa, M. Saukkoriipi, J. Kangas, N. Rasouli, J. Järnstedt, H. Mehtonen, J. Sahlsten, J. Jaskari, K. Kaski, R. Raisamo, Tampere University; Tampere University Hospital; Aalto University; Aalto University School of Science and Technology, Espoo (FI) [LE-25-00093]

16:15 Spatiotemporally Constrained 3D Reconstruction from Biplanar Digital Subtraction Angiography
S. Frisken, V. Gopalakrishnan, D.D. Chlorogiannis, N. Haouchine, A. Cafaro, A. Golby, W. Wells, R. Du, Harvard Medical School; Brigham and Women's Hospital, Boston, MA, Massachusetts Institute of Technology, Cambridge, MA (US) [LE-25-00041]

16:30 Left Ventricular Motion Analysis Framework for the MATRIX-VT Study
C. Janorschke, S.S. Popescu, J. Osburg, X. Lu, J. Xie, E. Yaman, C. Marquetand, O. Blanck, H. Alessandrini, A. Schweikard, R.R. Tilz, University of Lübeck; University Heart Center Lübeck; University Medical Center Schleswig-Holstein, Kiel (DE) [LE-25-00058]

16:45 Dynamic Radiotherapy Dose Prediction
L. Bhatnagar, T. Arsenault, Case Western Reserve University, Cleveland, OH (US) [LE-25-00048]

17:00 Multi-modal classification of soft-tissue sarcoma
C. Martin, W. Assy, M. Martin, H.-J. Meier, R. S. E. Kursawe, F. M. Uhlenbruch, G. Osterhoff, University Leipzig (DE) [LE-124]

17:15 PACS-integrated automated head circumference measurement and brain tissue quantification from MRI in paediatrics
H. Zamanian, A. Rau, M. Nelson, M. Borzage, J. Wood, I. E. Duman-Kavus, E. Doyle, H. Urbach, S. Erberich, Children's Hospital Los Angeles; University of Southern California, Los Angeles, CA (US); University of Freiburg Medical Center (DE) [LE-109]

17:30 End of Session

17:30–18:30 WG-24: DICOM in Surgery: Meeting on Structured Report, Stereoscopic imaging and Future Topics

Chairs: Oliver Burgert, PhD (DE), Christian Kücherer, PhD, (DE)

Friday, June 20, 2025

**17th CARS Clinical Day – Innovative Clinical Investigations****Chairs:** Tobias Penzkofer, MD (DE), Leonard Berliner, MD (US), Eric vanSonnenberg, MD (US)**Robert Koch****08:00–09:30 Interventional Radiology****Session Chairs:** Tobias Penzkofer, MD (DE), Maryam E. Rettmann, PhD (US)

08:00 Deep learning-based image registration method for RFA treatment efficacy evaluation without magnetic sensors
R. Kasagi, N. Koizumi, P. Chen, N. Umetsu, K. Numata, The University of Electro-Communications, Chofu; Yokohama City University Medical Center (JP) [LE-64]

08:15 Estimation of tumor coverage after RF ablation of hepatocellular carcinoma using single 2D image slices
N. Varble, M. Li, L. Saccenti, T. Borde, A. Arrichiello, A. Christou, K. Lee, L. Hazen, S. Xu, R. Lencioni, B.J. Wood, National Institutes of Health, Bethesda, MD (US); Pisa University School of Medicine, Cisanello Hospital, Pisa (IT) [LE-25-00074]

08:30 Exploratory Analysis and Framework for Tissue Classification Based on Vibroacoustic Signals from Needle-Tissue Interaction
K. Heryan, M. Friebe, W. Serwatka, D. Rzepka, P. Fuentealba, AGH University of Science and Technology, Kraków (PL); Otto-von-Guericke-University, Magdeburg (DE); Universidad Austral de Chile, Valdivia (CL) [LE-email-25-00095]

08:45 Predicting patient-specific instantaneous spatial temperature maps for MR-guided laser interstitial thermal therapy of epilepsy treatment using a physics-assisted deep learning framework
S. Sadatamin, S. Robbins, E. Donszelman-Lund, Y. Hau Wallace Lee, T. Latypov, R. Tyc, G. M. Ibrahim, L. A. Kahrs, A. C. Waspe, J. M. Drake, University of Toronto; McGill University; The Hospital for Sick Children, Toronto, ON (CA); Monteris Medical, Plymouth, MN (US); University of Waterloo (CA) [LE-25-00103]

09:00 Towards non-linear needle trajectories: performance analysis of the ARC passive-steerable needle in a phantom gel model
A. Morin, J. Verde, L. Rubbert, C. Essert, ICube, Illkirch-Graffenstaden; IHU Strasbourg (FR) [LE-82]

09:15 Autonomous Robotic Ultrasound-Guided Central Venous Catheter Placement
D. Raina, L. Al-Zoghbi, B. Teixeira, V. Singh, A. Kapoor, T. Fleiter, M. A. Bell, V. Pandian, A. Krieger, Johns Hopkins University, Baltimore, MD; Siemens Healthineers, Princeton, NJ; University of Maryland; Pennsylvania State University (US) [LE-89]

09:30 Break

09:45–11:00 Modelling and Visualization in Cardiovascular Interventions**Session Chairs:** Anja Hennemuth, PhD (DE), Simon Sündermann, MD (DE)

09:45 Towards learning 3D reconstruction of the coronary tree from labelled multi-view x-ray angiography images
A. Popp, R. Gayet, A. Abd El Al, M. Hoffmann, V. Falk, A. Hennemuth, A. Meyer, Charité – Universitätsmedizin Berlin (DE) [LE-79]

10:00 Carotid Artery Plaque Analysis in 3D Based on Distance Encoding in Mesh Representations
H. Rahlfs, M. Hüllebrand, S. Schmitter, C. Strecker, A. Harloff, A. Hennemuth, Deutsches Herzzentrum der Charité; Physikalisch-Technische Bundesanstalt, Berlin; Univ. Hosp. Freiburg (DE) [LE-25-00133]

10:15 Towards ICE-XRF fusion: real-time pose estimation of the intracardiac echo probe in 2D X-ray using deep learning
A. Severens, M. Meijjs, V. Pai Raikar, R. Lopata, University of Technology, Eindhoven; Philips Healthcare IGT Systems, Best (NL) [LE-122]

10:30 A multicenter study on the comparability of myocardial strain values acquired with different CMR scanners and analyzed with different post-processing software: Insights into the “Travelling Volunteers” study
C. Goetze, W. Chen, P. Doeblin, A. Demir, S. Wiesemann, J. Hansmann, V. Falk, J. Schulz-Menger, J. Erley, S. Kelle, Deutsches Herzzentrum der Charité, Berlin; HELIOS Klinikum Berlin Buch; Theresienkrankenhaus Mannheim; University Medical Center Hamburg-Eppendorf (DE); The Affiliated Hospital of Xuzhou Medical University, Xuzhou (CN) [LE-25-00081]

10:45 Extended reality to improve radiotherapy plan visualization in Stereotactic Arrhythmia Radioablation
D. Riggio, J. Leitão, M. Grehn, J. Seco, O. Blanck, M. F. Spadea, Karlsruhe Institute of Technology; German Cancer Research Centre, Heidelberg; University Medical Center Schleswig-Holstein, Kiel (DE) [LE-68]

11:00 Break

11:15–13:00 Human Computer Interaction and Modelling**Session Chairs:** Makoto Hashizume, MD (JP), Heinz U. Lemke, PhD (DE)

11:15 From Computer-Assisted to Computer-Integrated: Hybrid Brains and Neuro-organoid Computers
R. Andrews, WFNS, Los Gatos, CA (US) [LE-44]

11:30 AI-driven interactive avatars for supporting communication in clinical and preoperative settings
A. Meyer, N. Rathmann, S. Diehl, M. Vetter, University of Applied Sciences Mannheim; Heidelberg University (DE) [LE-42]

11:45 PEXRT: Q-learning-based adaptive learning framework for distress detection and patient experience in radiotherapy
A. Kumar, I. N. Alvarez, M. R. Sharif, M. Cypko, O. Amft, University of Freiburg; Hahn-Schickard-Gesellschaft für angewandte Forschung e. V., Villingen-Schwenningen (DE) [LE-97]

12:00 Towards Alliances for realising Model-Guided Medicine
Invited Speaker: Hugo Herrero A. de Vez, MD, Centro Médico Teknon, Barcelona (ES) [IS-130]

12:15 Surgical data science for women's health
Invited Lecture: Krystel Nyangoh Timoh, MD, PhD, Pierre Jannin, PhD, University of Rennes (FR) [IS-137]

12:30–13:00 Panel Discussion**Panelists:** R. Andrews, M. Cypko, H. Herrero A. de Vez, K. Nyangoh Timoh, P. Jannin**13:00 Closing Remarks**

Volkmar Falk, MD (DE)



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