MIDL Zürich 2022

Conference Booklet

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AI INTERPRETING ORTHOPAEDIC MRI

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CONFERENCE AT A GLANCE

Wednesday 6th of July

09.40 - 10:00 Welcome
10.00 - 10:40 Oral Session 1.1: *Segmentation I*
10:40 - 11:00 Coffee Break
11:00 - 12:00 Poster Session 1.2 / 1.1
12:00 - 12:20 Sponsor Event : AWS
12:20 - 12:40 Sponsor Event: ImFusion
12:20 - 13:20 Lunch
13:20 - 14:00 Oral Session 1.2: *Explainable AI*
14:00 - 15:00 Keynote: Dr. Dorin Comaniciu
15:00 - 15:20 Coffee Break
15:20 - 16:20 Poster Session 1.1 / 1.2
16:20 - 17:20 Oral Session 1.3: *Registration*
17:20 Reception & Get together

Thursday 7th of July

09:40 - 10:40 Oral Session 2.1: *Domain Adaptation and Model Generalization*
10:40 - 11:00 Coffee Break
11:00 - 12:00 Poster Session 2.2 / 2.1
12:00 - 12:20 Virtual Q&A Session: Siemens Healthineers
12:20 - 13:20 Lunch
13:20 - 14:00 Oral Session 1.2: *Unsupervised and Representation Learning*
14:00 - 15:00 Keynote: Prof. Dr. Julia Schnabel
15:00 - 15:20 Coffee Break
15:20 - 16:20 Poster Session 2.1 / 2.2
16:20 - 17:20 Oral Session 1.3: *Segmentation II*

Friday 8th of July

09:40 - 10:40 Oral Session 3.1: *Trustworthy AI*
10:40 - 11:00 Coffee Break
11:00 - 12:00 Poster Session 3.2 / 3.1
12:00 - 12:20 Sponsor Event : Align Technology GmbH
12:20 - 13:20 Lunch
13:20 - 14:00 Oral Session 3.2: *Computer Aided Detection and Diagnosis*
14:00 - 15:00 Keynote: Prof. Dr. Klaas Pruessmann
15:00 - 15:20 Coffee Break
15:20 - 16:20 Poster Session 3.1 / 3.2
16:20 - 17:20 Oral Session 3.3: *Data Efficient Learning*
17:20 - 18:00 Awards & Closing Ceremony

ORGANIZATION COMMITTEE

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Xiahai Zhuang

KEYNOTE SPEAKERS

Dr. Dorin Comaniciu
Wednesday 6th of July, 14:00 - 15:00

Artificial Intelligence for Healthcare: From Patient Twinning to Precision Therapy

We are concluding an exciting period of Artificial Intelligence (AI) Discovery in healthcare. Numerous AI solutions have been developed, tested, and some of them deployed in clinical workflows. Medical imaging, in particular, has been a fertile ground of AI experimentation and innovation, most likely due to its closeness to computer vision, a field that has attracted the most AI investment. Nevertheless, when we examine the impact of AI on clinical workflows, we recognize that more focus is needed to translate AI into value for clinicians and their patients. Our conjecture is that after the AI Discovery phase, we will enter an equally exciting, but different period, of AI Operationalization, focused on translation, clinical value, performance, and automation. Furthermore, a third period will be about AI solving Grand Healthcare Challenges, such as Data Integration / Standardization and the problem of Health Management. We will illustrate these advances with multiple clinical examples, covering the personalization of patient sensing, diagnosis, and therapy selection – calledPatient Twinning – and the delivery of image-guided Precision Therapy.

Biography: Dorin Comaniciu serves as Senior Vice President for Artificial Intelligence and Digital Innovation at Siemens Healthineers. His scientific contributions to computational imaging and machine intelligence have translated to multiple clinical products focused on improving the quality of care, specifically in the fields of diagnostic imaging, image-guided therapy, and precision medicine. Dr. Comaniciu is a member of the National Academy of Medicine and a Top Innovator of Siemens. He is a Fellow of the IEEE, ACM, Medical Image Computing and Computer-Assisted Intervention Society, and American Institute for Medical and Biological Engineering. He is the recipient of multiple honors, including an honorary doctorate and the IEEE Longuet-Higgins Prize for fundamental contributions to computer vision. Comaniciu is listed on Wikipedia's list of prolific inventors with 306 granted US patents on healthcare technology. He has co-authored 350 peer-reviewed publications in the areas of machine intelligence, medical imaging, and precision medicine, which have received 53,000 citations, with an h-index of 84. He is an advocate for technological innovation that saves and enhances lives, addressing critical issues in global health.

Prof. Dr. Julia Schnabel
Thursday 7th of July, 14:00 - 15:00

FIDL: Fetal Imaging with Deep Learning

Fetal imaging is conventionally carried out using ultrasound sonography as the modality of choice, due to its non-ionising nature, real-time acquisition, portability, low cost and wide availability. However, it also requires significant operator skills and can be of variable image quality, making accurate manual measurements required for fetal biometrics often challenging. Deep learning has proven to be a game changer in this application, as it can directly operate on the incoming ultrasound video stream in near-real time, allowing for online semantic detection, labelling, measurements, and ultimately, clinical reporting. In this talk I will present our work in this field, as part a large interdisciplinary project on intelligent fetal imaging and diagnosis (ifind-project.com) which was fully embedded in a hospital setting for fast clinical translation.

Biography: Julia Schnabel graduated in Informatics (equiv. MSc) from Technical University of Berlin, Germany, and was awarded the Ph.D. in Computer Science from University College London, UK. After postdoc positions at University Medical Center Utrecht NL, King's College London, and University College London, UK, she joined the University of Oxford, the UK in 2007 as an Associate Professor in Engineering Science (Medical Imaging), where she became a Full Professor of Engineering Science by Recognition of Distinction in 2014. She subsequently joined King's College London as a new Chair in Computational Imaging in 2015, and in 2021 also joined the Technical University of Munich as a Professor of Computational Imaging and AI in Medicine (TUM Liesel Beckmann Distinguished Professorship) and Helmholtz Center Munich as the Director of a new Institute of Machine Learning in Biomedical Imaging (Helmholtz Distinguished Professorship). Julia's research interests include machine/deep learning, nonlinear motion modeling, as well as multimodality and quantitative imaging, for cancer imaging, cardiac imaging, neuroimaging, and perinatal.

KEYNOTE SPEAKERS

Prof. Dr. Klaas Pruesmann
Friday 8th of July, 14:00 - 15:00

Richer data, better defined: Gearing up MRI for the learning age

Artificial intelligence is set to change the use and utility of medical image data in essential ways. It promises to overcome limitations of human observers in terms of information throughput, depth of analysis, and cost. One challenge that learning-based AI and human readers share, however, is the need for extensive, well-characterized training data. Scarcity of relevant clinical data is one of the chief obstacles to learning approaches. This problem is exacerbated by variability in imaging conditions and perturbation by uncontrolled factors, which further boost the amount of data required for robust training. Our hypothesis is that medical imaging technology should react to this combination of opportunity and obstruction. It should seek to boost the baseline information content of image data for AI to reap while taking tighter control of imaging processes to minimize training overhead. We argue that these objectives are in order particularly for MRI, which taps great amounts and diversity of information but is notoriously susceptible to perturbations.

Biography: Klaas Pruessmann studied Physics and Medicine at the University of Bonn, Germany, and graduated with a Physics Diploma in 1995. He received a Ph.D. in Physics from ETH Zurich in the year 2000. In 2002, he joined the ETH's Department of Information Technology and Electrical Engineering as an Assistant Professor. Since 2005, he has been a Full Professor of Bioimaging at ETH, co-affiliated with the Faculty of Medicine of the University of Zurich. Since 2012, he heads the two schools' joint Institute for Biomedical Engineering. His research focuses on biomedical imaging technology, particularly on magnetic resonance imaging, which he addresses at the levels of underlying physics, hardware, encoding strategies, signal processing, and image reconstruction. In the realm of instrumentation, his lab's recent emphasis is on in-bore and on-patient sensing technology as well as equipment for ultra-fast and solid-state imaging.

10:00 - 10:40 Oral Session 1.1: Segmentation I

Left Ventricle Contouring in Cardiac Images Based on Deep Reinforcement Learning
Sixing Yin, Yameng Han, Judong Pan, Yining Wang, Shufang Li

Learning Shape Reconstruction from Sparse Measurements with Neural Implicit Functions
Tamaz Amiranashvili, David Lüdke, Hongwei Li, Bjoern Menze, Stefan Zachow

Are 2.5D Approaches Superior to 3D Deep Networks in Whole Brain Segmentation?
Saikat Roy, David Kügler, Martin Reuter

10:40 -11:00 Coffee Break

PROGRAM – WEDNESDAY

11:00 -12:00 Poster Session 1.1: Computer Assisted Diagnosis & Segmentation *(virtual)*

Long Papers

Inference of captions from histopathological patches
Masayuki Tsuneki,Fahdi Kanavati

Prior Guided Multitask Learning for Joint Optic Disc/Cup Segmentation and Fovea Detection
Huaqing He,Li Lin,Zhiyuan Cai,Xiaoying Tang

Left Ventricle Contouring in Cardiac Images Based on Deep Reinforcement Learning
Sixing Yin,Yameng Han,Judong Pan,Yining Wang,Shufang Li

AdwU-Net: Adaptive Depth and Width U-Net for Medical Image Segmentation by Differentiable Neural Architecture Search
Ziyan Huang,Zehua Wang,Zhikai Yang,Lixu Gu

Region Aware Transformer for Automatic Breast Ultrasound Tumor Segmentation
Xiner Zhu,Haoji Hu,Hualiang Wang,Jincao Yao, Wei Li,Di Ou,Dong Xu

YAMU: Yet Another Modified U-Net Architecture for Semantic Segmentation
Pranab Samanta,Nitin Singhal

Hybrid Ladder Transformers with Efficient Parallel-Cross Attention for Medical Image Segmentation
Haozhe Luo,Yu Changdong,Raghavendra Selvan

Automatic Segmentation of Head and Neck Tumor: How Powerful Transformers Are?
Ikboljon Sobirov,Otabek Nazarov,Hussain Alasmawi,Mohammad Yaqub

Attention Guided Deep Supervision Model for Prostate Segmentation in MultiSite Heterogeneous MRI Data
Kuruparan Shanmugalingam,Arcot Sowmya,Daniel Moses,Erik Meijering

Anomaly-Aware 3D Segmentation of Knee Magnetic Resonance Images
Boyeong Woo,Craig Engstrom,Jurgen Fripp,Stuart Crozier,Shekhar S. Chandra

Explainability Guided Image Classification
Ameen Ali Ali,Tal Shaharabany,Lior Wolf

Practical uncertainty quantification for brain tumor segmentation
Moritz Fuchs,Camila Gonzalez,Anirban Mukhopadhyay

Automatic planning of liver tumor thermal ablation using deep reinforcement learning
Krishna Chaitanya,Chloe Audigier,Laura Elena Balascuta,Tommaso Mansi

SMU-Net: Style matching U-Net for brain tumor segmentation with missing modalities
Reza Azad,Nika Khosravi,Dorit Merhof

Efficient tool segmentation for endoscopic videos in the wild
Clara Tomasini,Iñigo Alonso,Luis Riazuelo,Ana C Murillo

Holistic Modeling in Medical Image Segmentation Using Spatial Recurrence
João B. S. Carvalho,João Santinha,Đorđe Miladinović,Carlos Cotrini,Joachim M. Buhmann

Temperature Calibration of Convolutional Neural Networks for Medical Image Segmentation
Farina Kock,Felix Thielke,Grzegorz Chlebus,Hans Meine

PROGRAM – WEDNESDAY

Short Papers

Position Classifier: Rethinking Position Encoding on Chest X-ray Diseases Identification
Yu Wen Fang,Fang-Yi Su,Jung-Hsien Chiang

Classification and Segmentation of Vulvovaginal Candidiasis in Microscopic Leucorrhea Images Based on Combined Deep Learning Model
Yiyao Ma,Yifei Xu,Wei Li

SinusNet: Label-Free Segmentation of Maxillary Sinus Lesion in CBCT Images
DaEl Kim,Su Yang,Seryong Kang,Jin Kim,Soyoung Chun,MinHyuk Choi,Won-Jin Yi

Deeply supervised network for white matter hyperintensities segmentation with transfer learning
Yilei Wu,Fang Ji,Yao Feng Chong,Li-Hsian Christopher Chen,Juan Helen Zhou

Prostate Cancer Diagnosis and Grading in Whole Slide Images of Core Needle Biopsies
Nitin Singhal,Nilanjan Chattopadhyay,Pranab Samanta,Saikiran Bonthu

Learning Robust Representation for Laryngeal Cancer Classification in Vocal Folds from Narrow Band Images
Debayan Bhattacharya,Finn Behrendt,Axelle Felicio-Briegel,Veronika Volgger,Dennis Eggert,Christian Betz,Alexander Schlaefer

Classification of visibility in multi-stain microscopy images
Jonathan Ganz,Christof Bertram,Robert Klopfleisch,Samir Jabari,Katharina Breininger,Marc Aubreville

Gleason grading of prostate cancer using artificial intelligence: lessons learned from the PANDA challenge
Kimmo Kartasalo,Peter Ström,Martin Eklund,Wouter Bulten,Hans Pinckaers,Geert Litjens,Po-Hsuan Cameron Chen,Kunal Nagpal,Pekka Ruusuvuori

Physical Color Calibration of Digital Pathology Scanners for Deep Learning Based Diagnosis of Prostate Cancer
Xiaoyi Ji,Richard Salmon,Nita Mulliqi,Henrik Olsson,Lars Egevad,Pekka Ruusuvuori,Martin Eklund,Kimmo Kartasalo

Deep Learning for Automatic Segmentation of Background Parenchymal Enhancement in Breast MRI
Sylwia Nowakowska,Karol Borkowski,Carlotta Ruppert,Patryk Hejduk,Alexander Ciritsis,Anna Landsmann,Magda Macron,Nicole Berger,Andreas Boss,Cristina Rossi

SwinFPN: Leveraging Vision Transformers for 3D Organs-At-Risk Detection
Bastian Wittmann,Suprosanna Shit,Fernando Navarro,Jan C. Peeken,Stephanie E. Combs,Bjoern Menze

Segmentation of post-operative glioblastoma
Ragnhild Holden Helland,David Bouget,Alexandros Ferles,Roelant S. Eijgelaar,Ole Solheim,Philip C. De Witt Hamer,Ingerid Reinertsen

Masked Autoencoders Pre-training in Multiple Instance Learning for Whole Slide Image Classification
Jianpeng An,Yunhao Bai,Huazhen Chen,Zhongke Gao,Geert Litjens

Automated tool to quantitatively assess bone disease on Whole-Body Diffusion Weighted Imaging for patients with Advanced Prostate Cancer
Antonio Candito,Matthew D Blackledge,Richard Holbrey,Dow-Mu Koh

Looking for abnormalities using asymmetrical information from bilateral mammograms
Xin Wang,Yuan Gao,Tianyu Zhang,Luyi Han,Regina Beets-Tan,Ritse Mann

On the pitfalls of deep image segmentation for lightsheet microscopy
Rami Al-Maskari,Johannes C. Paetzold,Izabela Horvath,Ali Erturk,Bjoern Menze

Scoliosis Measurement on DXA Scans Using a Combined Deep Learning and Spinal Geometry Approach
Emmanuelle Bourigault,Amir Jamaludin,Timor Kadir,Andrew Zisserman

Non-stationary deep lifting with application to acute brain infarct segmentation
Nadja Gruber,Markus Haltmeier,Annemieke ter Telgte,Johannes Schwab,Elke Gizewski,Malik Galijasevic

Strategies for Meta-Learning with Diverse Tasks
Stefano Woerner,Christian F. Baumgartner

11:00 -12:00 Poster Session 1.2: Registration, Image Reconstruction and Synthesis & Explainable AI *(onsite)*

Long Papers

KeypointMorph: Robust Multi-modal Affine Registration via Unsupervised Keypoint Detection
Evan M Yu,Alan Q. Wang,Adrian V Dalca,Mert R. Sabuncu

FBNETGEN: Task-aware GNN-based fMRI Analysis via Functional Brain Network Generation
Xuan Kan,Hejie Cui,Joshua Lukemire,Ying Guo,Carl Yang

Learned Half-Quadratic Splitting Network for MR Image Reconstruction
Bingyu Xin,Timothy S Phan,Leon Axel,Dimitris N. Metaxas

Negative Evidence Matters in Interpretable Histology Image Classification
Soufiane Belharbi,Marco Pedersoli,Ismail Ben Ayed,Luke McCaffrey,Eric Granger

Segmentation-Consistent Probabilistic Lesion Counting
Julien Schroeter,Chelsea Myers-Colet,Douglas Arnold,Tal Arbel

SynthMap: a generative model for synthesis of 3D datasets for quantitative MRI parameter mapping of myelin water fraction
Serge Vasylechko,Simon Keith Warfield,Sila Kurugol,Onur Afacan

Deep Learning Radiographic Assessment of Pulmonary Edema from Serum Biomarkers
Justin Huynh,Samira Masoudi,Abraham Noorbakhsh,Amin Mahmoodi,kyle Hasenstab,Micheal Pazzani,Albert Hsiao

Improving Explainability of Disentangled Representations using Multipath-Attribution Mappings
Lukas Klein,João B. S. Carvalho,Mennatallah El-Assady,Paolo Penna,Joachim M. Buhmann,Paul F Jaeger

Vision Transformers Enable Fast and Robust Accelerated MRI
Kang Lin,Reinhard Heckel

A Flexible Meta-Learning Model for Image Registration
Frederic Kanter,Jan Lellmann

Warmstart Approach for Accelerating Deep Image Prior Reconstruction in Dynamic Tomography
Tobias Knopp,Mirco Grosser

Short Papers

Leveraging Uncertainty for Deep Interpretable Classification and Weakly-Supervised Segmentation of Histology Images
Soufiane Belharbi,Jérôme Rony,Jose Dolz,Ismail Ben Ayed,Luke McCaffrey,Eric Granger

Representing 3D Ultrasound with Neural Fields
Ang Nan Gu,Purang Abolmaesumi,Christina Luong,Kwang Moo Yi

The do's and don'ts of reinforcement learning for tractography
Antoine Theberge,Christian Desrosiers,Pierre-marc Jodoin,Maxime Descoteaux

Scale-Agnostic Super-Resolution in MRI using Feature-Based Coordinate Networks
Dave Van Veen,Rogier Van der Sluijs,Batu Ozturkler,Arjun D Desai,Christian Bluethgen,Robert D. Boutin,Marc H. Willis,Gordon Wetzstein,David B. Lindell,Shreyas Vasanawala,John M. Pauly,Akshay Chaudhari

Medical Image Quality Assurance using Deep Learning
Dženan Zukić,Anne Haley,Curtis Lisle,James Klo,Kilian M. Pohl,Hans J Johnson,Aashish Chaudhary

Evaluating graph fairness in transductive learning
Fernanda Lenita Ribeiro,Valentina Shumovskaia,Thomas Davies,Ira Ktena

A glimpse of ClinicaDL, an open-source software for reproducible deep learning in neuroimaging
Elina Thibeau-Sutre,Mauricio Díaz,Ravi Hassanaly,Olivier Colliot,Ninon Burgos

Clustered-CAM: Visual Explanations for Deep Convolutional Networks for Thyroid Nodule Ultrasound Image Classification
Ali Eskandari,Hongbo Du,Alaa Alzoubi

On the performance of learned and fixed-framelet shrinkage networks for low-dose CT denoising
Luis Albert Zavala Mondragon,Peter H.N. de With,Fons van der Sommen

Primal-Dual UNet for Sparse View Cone Beam Computed Tomography Volume Reconstruction
Philipp Ernst,Soumick Chatterjee,Georg Rose,Andreas Nürnberger

Field Strength Agnostic Cardiac MR Image Segmentation
Seb Harrevelt,Yasmina Al Khalil,Sina Amirrajab,Josien P.W. Pluim,Marcel Breeuwer,Alexander Raaijmakers

A Python application programming interface for accessing Philips iSyntax whole slide images for computational pathology
Nita Mulliqi,Kimmo Kartasalo,Henrik Olsson,Xiaoyi Ji,Lars Egevad,Martin Eklund,Pekka Ruusuvuori

Deep learning–based synthesis of hyperpolarized gas MRI ventilation from 3D multi-inflation proton MRI
Joshua Russell Astley,Alberto M Biancardi,Helen Marshall,Laurie J Smith,Paul JC Hughes,Guilhem J Collier,Matthew Q Hatton,Jim M Wild,Bilal Tahir

Do we really need all these preprocessing steps in brain MRI segmentation?
Ekaterina Kondrateva,Polina Druzhinina,Anvar Kurmukov

Can Transformers capture long-range displacements better than CNNs?
Paraskevas Pegios,Steffen Czolbe

Robustness Against Out of Distribution Video Frames in Online Surgical Workflow Recognition with Temporal Convolutional Networks
Amirhossein Bayat,Kadir Kirtac,Salih karagoz,Julien Schwerin,Michael Stenzel,Marco Smit,Florian Aspart

Dual Branch Prior-SegNet: CNN for Interventional CBCT using Planning Scan and Auxiliary Segmentation Loss
Philipp Ernst,Suhita Ghosh,Georg Rose,Andreas Nürnberger

The effect of intra-scan motion on AI reconstructions in MRI
Laurens Beljaards,Nicola Pezzotti,Christophe Schülke,Matthias J. P. van Osch,Marius Staring

Efficient Exploitation of Image Repetitions in MR Reconstruction
Fasil Gadjimuradov,Thomas Benkert,Marcel Dominik Nickel,Andreas Maier

Learning Registration Models with Differentiable Gauss-Newton Optimisation
Mattias P Heinrich

12:00- 12:20 Lunch Event of Sponsor AWS (podium):
"Inspectio: An AWS Native Architecture for 3D MultiClass Brain Tumor Segmentation"

12:20-12:40 Lunch Event of Sponsor ImFusion (podium)

PROGRAM – WEDNESDAY

13:20 - 14:00 Oral Session 1.2: Explainable AI

Self-supervised learning for analysis of temporal and morphological drug effects in cancer cell imaging data.
Andrei Dmitrenko, Mauro Miguel Masiero, Nicola Zamboni

FBNETGEN: Task-aware GNN-based fMRI Analysis via Functional Brain Network Generation
Xuan Kan, Hejie Cui, Joshua Lukemire, Ying Guo, Carl Yang *(virtual presentation)*

Surface Vision Transformers: Attention-Based Modelling applied to Cortical Analysis
Simon Dahan, Abdulah Fawaz, Logan Zane John Williams, Chunhui Yang, Timothy S. Coalson, Matthew Glasser, A David Edwards, Daniel Rueckert, Emma Claire Robinson

14:00 - 15:00 Keynote: Dr. Dorin Comaniciu

15:00 - 15:20 Coffee Break

15:20 - 16.20 Poster Session 1.1: Computer Assisted Diagnosis & Segmentation *(onsite)*
Poster Session 1.2: Registration, Image Reconstruction and Synthesis & Explainable AI *(virtual)*

16:20 - 17:20 Oral Session 1.3: Registration

Implicit Neural Representations for Deformable Image Registration
Jelmer M. Wolterink, Jesse C. Zwienenberg, Christoph Brune

KeyMorph: Robust Multi-modal Affine Registration via Unsupervised Keypoint Detection
Evan M Yu, Alan Q. Wang, Adrian V Dalca, Mert R. Sabuncu

TopoFit: Rapid Reconstruction of Topologically-Correct Cortical Surfaces
Andrew Hoopes, Juan Eugenio Iglesias, Bruce Fischl, Douglas Greve, Adrian V Dalca

A Flexible Meta-Learning Model for Image Registration
Frederic Kanter, Jan Lellmann

RECEPTION & GET TOGETHER

Come and join the reception and welcome event right after the end of the first day in MIDL, which is fully included in the conference registration. There will be drinks and snacks.

Venue:
ETH main building.

Time:
17:20 – 18:00

aws

Medical Imaging on AWS ›

Unlock the value of imaging data to enable effective, personalized care

As the importance of medical images continues to grow, healthcare organizations need access to dynamic, cost-effective, scalable capacity for the storage and archiving of petabytes of medical imaging data.

Amazon Web Services (AWS) empowers radiologists and health systems to increase the pace of innovation, unlock the potential of imaging data, develop more personalized approaches to care delivery, and improve cost and operational efficiency.

AWS and AWS partners offer solutions that migrate imaging to the cloud to lower costs amidst fluctuating storage needs, strengthen data accessibility, and facilitate compliance — driving faster insights and better value.

"We needed a scalable solution, and that is why we reached out to AWS. We migrated our entire system to AWS in only 2 months."

Bram van Ginneken
Professor of Medical Image Analysis
Radboud University Medical Center

Read the case study ›

AWS empowers radiology in the cloud

Access and collaborate

Drive better care coordination and treatment decisions with seamless, efficient, and secure access to medical and health information exchanges, reducing system complexities and delays.

Reduce costs

Leverage on-demand compute resources to scale up or down based on need without paying for resource-heavy, on-premises hardware and storage. Reduce downtime risk and meet regulatory requirements with the latest security best practices.

Improve and optimize with AI/ML

Employ AI/ML to support anomaly detection for triaging the most urgent cases, speeding diagnoses, and improving patient outcomes. Power the interpretation process with smart automation to support PACS integration and provide fast, efficient delivery of AI outputs to radiologists.

"By using AWS, we are able to release algorithms targeting new pathologies every three months. That speed is unheard of in our industry, and it absolutely differentiates us."

Guy Reiner
Vice President of Research and Development
Aidoc

09:40 - 10:40 Oral Session 2.1: Domain Adaptation and Model Generalization

OptTTA: Learnable Test-Time Augmentation for Source-Free Medical Image Segmentation Under Domain Shift
Devavrat Tomar, Guillaume Vray, Jean-Philippe Thiran, Behzad Bozorgtabar

Signal Domain Learning Approach for Optoacoustic Image Reconstruction from Limited View Data
Anna Klimovskaia, Berkan Lafci, Firat Ozdemir, Neda Davoudi, Xose Luis Dean-Ben, Fernando Perez-Cruz, Daniel Razansky

Domain Adaptive 3D Human Pose Estimation Through Anatomical Constraints
Alexander Bigalke, Lasse Hansen, Jasper Diesel, Mattias P Heinrich

Domain Generalization for Retinal Vessel Segmentation with Vector Field Transformer
Dewei Hu, Hao Li, Han Liu, Ipek Oguz *(virtual presentation)*

10:40 -11:00 Coffee Break

PROGRAM – THURSDAY

11:00 -12:00 Poster Session 2.1: Domain Adaptation and Model Generalization, Image Reconstruction and Synthesis & Explainable AI *(virtual)*

Long Papers

Breathing Freely: Self-supervised Liver T1rho Mapping from A Single T1rho-weighted Image
Chaoxing Huang,Yurui Qian,Jian Hou,Baiyan Jiang,Queenie Chan,Vincent Wong,Winnie Chiu Wing Chu,Weitian Chen

Unsupervised Domain Adaptation through Shape Modeling for Medical Image Segmentation
Yuan Yao,Fengze Liu,Zongwei Zhou,Yan Wang,Wei Shen,Alan Yuille,Yongyi Lu

PILLET-GAN: Pixel-Level Lesion Traversal Generative Adversarial Network for Pneumonia Localization
Hyunwoo Kim,Hanbin Ko,Jungjun Kim

Is it Possible to Predict MGMT Promoter Methylation from Brain Tumor MRI Scans using Deep Learning Models?
Numan Saeed,Shahad Emad Hardan,Kudaibergen Abutalip,Mohammad Yaqub

MR Image Super Resolution By Combining Feature Disentanglement CNNs and Vision Transformers
Dwarikanath Mahapatra,Zongyuan Ge

On learning adaptive acquisition policies for undersampled multi-coil MRI reconstruction
Tim Bakker,Matthew J. Muckley,Adriana Romero-Soriano,Michal Drozdzal,Luis Pineda

Angular Super-Resolution in Diffusion MRI with a 3D Recurrent Convolutional Autoencoder
Matthew Lyon,Mauricio A Álvarez,Paul Armitage

Explainable Weakly-Supervised Cell Segmentation by Canonical Shape Learning and Transformation
Pedro Costa,Alex Gaudio,Aurélio Campilho,Jaime S Cardoso

Short Papers

Evaluation beyond y and p(y)
Thijs Kooi

Stress Testing Vision Transformers Using Common Histopathological Artifacts
Geetank Raipuria,Nitin Singhal

AI at the forefront of the eye: Triaging tool for confocal microscopy images of human cornea
Vlada Rozova,Kh Tohidul Islam,Laura E Downie,Holly Chinnery,Karin Verspoor

Three-Dimensional Medical Image Synthesis with Denoising Diffusion Probabilistic Models
Zolnamar Dorjsembe,Sodtavilan Odonchimed,Furen Xiao

Sentinel lymph node status prediction using self-attention networks and contrastive learning from routine histology images of primary tumours
Carlos Hernandez-Perez,Veronica Vilaplana,Josep Malvehy,Marc Combalia

Novel Deep Learning Approach to Derive Cytokeratin Expression and Epithelium Segmentation from DAPI
Felix Jakob Segerer,Katharina Nekolla,Lorenz Rognoni,Ansh Kapil,Markus Schick,Helen Angell,Günter Schmidt

Automated Multibeat Tissue Doppler Echocardiography Analysis Using Deep Neural Networks
Elisabeth Sarah Lane,Jevgeni Jevsikov,Niti Dhutia,Matthew J Shun-shin,Darrel P Francis,Massoud Zolgharni

SHAPR Predicts 3D Cell Shapes from 2D Microscopic Images
Dominik Waibel,Niklas Kiermeyer,Scott Atwell,Ario Sadafi,Matthias Meier,-Carsten Marr

Image-to-image translation trained on unrelated histopathology data helps for Domain Generalization
Marin Scalbert,Maria Vakalopoulou,Florent Couzinie-Devy

DDoS-UNet: Incorporating temporal information using Dynamic Dual-channel UNet for enhancing super-resolution of dynamic MRI
Soumick Chatterjee,Chompunuch Sarasaen,Georg Rose,Andreas Nürnberger,Oliver Speck

Super-resolution microbubble localization in unprocessed ultrasound RF signals using a 1D dilated CNN
Nathan Blanken,Jelmer M. Wolterink,Hervé Delingette,Christoph Brune,Michel Versluis,Guillaume Lajoinie

Super-Resolution for Ultra High-Field MR Images
Qi Wang,Julius Steiglechner,Tobias Lindig,Benjamin Bender,Klaus Scheffler,Gabriele Lohmann

Super-resolution of portable low-field MRI in real scenarios: integration with denoising and domain adaptation
Sonia Laguna,Riana Schleicher,Benjamin Billot,Pamela Schaefer,Brenna McKaig,Joshua N. Goldstein,Kevin N. Sheth,Matthew S. Rosen,W. Taylor Kimberly,Juan Eugenio Iglesias

Mesh-based 3D Reconstruction from Bi-planar Radiographs
Moritz Jokeit,Ji Hyun Kim,Jess Gerrit Snedeker,Mazda Farshad,Jonas Widmer

11:00 -12:00 Poster Session 2.2: Learning with Noisy Labels Unsupervised and Representation Learning & Segmentation *(onsite)*

Long Papers

Speckle and Shadows: Ultrasound-specific Physics-based Data Augmentation Applied to Kidney Segmentation
Rohit Singla,Cailin Ringstrom,Ricky Hu,Victoria Lessoway,Janice Reid,Chris Nguan,Robert Rohling

Bridging the Gap: Point Clouds for Merging Neurons in Connectomics
Jules Berman,Dmitri Chklovskii,Jingpeng Wu

Omni-Seg: A Single Dynamic Network for Multi-label Renal Pathology Image Segmentation using Partially Labeled Data
Ruining Deng,Quan Liu,Can Cui,Zuhayr Asad,Haichun Yang,Yuankai Huo

CAiD: A Self-supervised Learning Framework for Empowering Instance Discrimination in Medical Imaging
Mohammad Reza Hosseinzadeh Taher,Fatemeh Haghighi,Michael Gotway,Jianming Liang

SZLoc: A Multi-resolution Architecture for Automated Epileptic Seizure Localization from Scalp EEG
Jeff Craley,Emily Johnson,Christophe C Jouny,David Hsu,Raheel Ahmed,Archana Venkataraman

Interpretable Prediction of Lung Squamous Cell Carcinoma Recurrence With Self-supervised Learning
Weicheng Zhu,Carlos Fernandez-Granda,Narges Razavian

Learning Strategies for Contrast-agnostic Segmentation via SynthSeg for Infant MRI data
Ziyao Shang,Md Asadullah Turja,Eric Feczko,Audrey Houghton,Amanda Rueter,Lucille A Moore,Kathy Snider,Timothy Hendrickson,Paul Reiners,Sally Stoyell,Omid Kardan,Monica Rosenberg,Jed T Elison,Damien A Fair,Martin Andreas Styner

Detecting Out-of-Distribution via an Unsupervised Uncertainty Estimation for Prostate Cancer Diagnosis
Jingya Liu,Bin Lou,Mamadou Diallo,Tongbai Meng,Heinrich von Busch,Robert Grimm,Yingli Tian,Dorin Comaniciu,Ali Kamen,David Winkel,Henkjan Huisman,Angela Tong,Tobias Penzkofer,Ivan Shabunin,Moon Hyung Choi,Pengyi Xing,Dieter Szolar,Steven Shea,Fergus Coakley,Mukesh Harisinghani

Learning Morphological Feature Perturbations for Semi-Supervised Segmentation
Moucheng Xu,Yukun Zhou,Chen Jin,Stefano B Blumberg,Frederick Wilson,Neil Oxtoby,Marius De Groot,Daniel C. Alexander,Joseph Jacob

Diffusion Models for Implicit Image Segmentation Ensembles
Julia Wolleb,Robin Sandkuehler,Florentin Bieder,Philippe Valmaggia,Philippe C. Cattin

Comparing representations of biological data learned with different AI paradigms, augmenting and cropping strategies
Andrei Dmitrenko,Mauro Miguel Masiero,Nicola Zamboni

Denoising Autoencoders for Unsupervised Anomaly Detection in Brain MRI
Antanas Kascenas,Nicolas Pugeault,Alison Q O'Neil

On the Pitfalls of Using the Residual as Anomaly Score
Felix Meissen, Benedikt Wiestler, Georgios Kaissis, Daniel Rueckert

i3Deep: Efficient 3D interactive segmentation with the nnU-Net
Karol Gotkowski,Camila Gonzalez,Isabel Jasmin Kaltenborn,Ricarda Fischbach,Andreas Bucher,Anirban Mukhopadhyay

An Analysis of the Impact of Annotation Errors on the Accuracy of Deep Learning for Cell Segmentation
Şerban Vădineanu,Daniel Pelt,Oleh Dzyubachyk,Joost Batenburg

Deep Learning for Model Correction in Cardiac Electrophysiological Imaging
Victoriya Kashtanova,Ibrahim Ayed,Andony Arrieula,Mark Potse,patrick gallinari,Maxime Sermesant

Multi-Organ Nucleus Segmentation Using a Locally Rotation Invariant Bispectrum U-Net
Valentin Oreiller,Julien Fageot,Vincent Andrearczyk,John O. Prior,Adrien Depeursinge

MRI bias field correction with an implicitly trained CNN.
Attila Tibor Simko,Tommy Löfstedt,Anders Garpebring,Tufve Nyholm,Joakim Jonsson

PROGRAM – THURSDAY

Short Papers

Anatomically Constrained Semi-supervised Learning for Echocardiography Segmentation
Thierry Judge,Arnaud Judge,Pierre-marc Jodoin

Attention-based Dynamic Subspace Learners
Sukesh Adiga Vasudeva,Jose Dolz,Herve Lombaert

Building representations of different brain areas through hierarchical point cloud networks
Joy M Jackson,Ran Liu,Eva L Dyer

Improving the Self-Supervised Pretext Task for Histopathologic Subtype Classification
Ruiwen Ding,Anil Yadav,Erika Rodriguez,Ana Cristina Araujo Lemos da Silva,William Hsu

Metrics Reloaded - A new recommendation framework for biomedical image analysis validation
Annika Reinke

Adaptive Gradient Triplet Loss with Automatic Margin Learning for Forensic Medical Image Matching
Khanh Nguyen,Hoang Huy Nguyen,Aleksei Tiulpin

Fully Automated Thrombus Segmentation on CT Images of Patients with Acute Ischemic Stroke
Mahsa Mojtahedi,Manon Kappelhof,Elena Ponomareva,Henk van Voorst,Efstratios Gavves,Bart J. Emmer,Charles B. Majoie,Henk Marquering

Toward complete colorectal tumor resection using intraoperative ultrasound and ensemble learning
Freija Geldof,Stijn Pruijssers,Lynn-Jade S. Jong,Dinusha Veluponnar,Theo Ruers,Behdad Dashtbozorg

A multi-channel deep learning approach for lung cavity estimation using hyperpolarized gas and proton MRI
Joshua Russell Astley,Alberto M Biancardi,Helen Marshall,Paul JC Hughes,Guilhem J Collier,Laurie J Smith,James Eaden,Jim M Wild,Bilal Tahir

End-to-end learning for detecting MYC translocations
Stephan Dooper,Geert Litjens

Automated Oral Epithelial Dysplasia Grading Using Neural Networks and Feature Analysis
Neda Azarmehr,Adam Shephard,Hanya Mahmood,Nasir Rajpoot,Syed Ali Khurram

Capturing Inter-Slice Dependencies of 3D Brain MRI-Scans for Unsupervised Anomaly Detection
Finn Behrendt,Marcel Bengs,Debayan Bhattacharya,Julia Krüger,Roland Opfer,Alexander Schlaefer

Self- and Cross-attention based Transformer for left ventricle segmentation in 4D flow MRI
Xiaowu Sun,Li-Hsin Cheng,Rob J. van der Geest

A Semi-Supervised Deep Learning Approach for Multi-Stain Foreground Segmentation in Digital Pathology
Agathe de Vulpian,Valentina di Proietto,Gauthier Roy,Saima Ben Hadj,Rutger RH Fick

Multi-task learning to improve performance consistency in mammogram classification
Mickael Tardy,Diana Mateus

Maximizing Segmentation Quality of Under-sampled Motion Corrupted Cardiac Cine-MRI Using an End-to-End Deep Learning Model
Ahmed Adly,Ruud Van Sloun,Kerstin Hammernik,Jose Caballero,Daniel Rueckert,Nicola Pezzotti

Self-supervised learning of mammograms with pathology aware
Yuan Gao,Xin Wang,Tianyu Zhang,Luyi Han,Regina Beets-Tan,Ritse Mann

Multi-Modality Microscopy Image Style Augmentation for Nuclei Segmentation
Sophia J Wagner,Ye Liu,Tingying Peng

A Fully Automated Multi-Scale Pipeline for Oral Epithelial Dysplasia Grading and Outcome Prediction
Adam Shephard,Neda Azarmehr,Raja Muhammad Saad Bashir,Shan E Ahmed Raza,Hanya Mahmood,Syed Ali Khurram,Nasir Rajpoot

Influence of Loss Function on Left Ventricular Volume and Ejection Fraction Estimation in Deep Neural Networks
Preshen Naidoo,Eman I Alajrami,Elisabeth Sarah Lane,Jevgeni Jevsikov,Matthew J Shun-shin,Darrel P Francis,Massoud Zolgharni

Search for temporal cell segmentation robustness in phase-contrast microscopy videos
Estibaliz Gómez-de-Mariscal,Hasini Jayatilaka,Özgün Cicek,Thomas Brox,Denis Wirtz,Arrate Munoz-Barrutia

12:00- 12:20 Q&A Session of the Sponsor Siemens Healthineers *(virtual)*

13:20 - 14:00 Oral Session 2.2: Unsupervised and Representation Learning

Self-Supervised Representation Learning for High-Content Screening
Daniel Siegismund, Mario Wieser, Stephan Heyse, Stephan Steigele

Denoising Autoencoders for Unsupervised Anomaly Detection in Brain MRI
Antanas Kascenas, Nicolas Pugeault, Alison Q O'Neil

Interpretable Prediction of Lung Squamous Cell Carcinoma Recurrence With Self-supervised Learning
Weicheng Zhu, Carlos Fernandez-Granda, Narges Razavian *(virtual presentation)*

14:00 - 15:00 Keynote: Prof. Dr. Julia Schnabel

15:00 - 15:20 Coffee Break

15:20 - 16.20 Poster Session 2.1: Domain Adaptation and Model Generalization, Image Reconstruction and Synthesis & Explainable AI *(onsite)*
Poster Session 2.2: Learning with Noisy Labels Unsupervised and Representation Learning & Segmentation *(virtual)*

16:20 - 17:20 Oral 2.3: Segmentation II

Video-based Computer-aided Laparoscopic Bleeding Management: a Space-time Memory Neural Network with Positional Encoding and Adversarial Domain Adaptation
Navid Rabbani, Callyane Seve, Nicolas Bourdel, Adrien Bartoli

Label Conditioned Segmentation
Tianyu Ma, Benjamin C. Lee, Mert R. Sabuncu

Learning Morphological Feature Perturbations for Semi-Supervised Segmentation
Moucheng Xu, Yukun Zhou, Chen Jin, Stefano B Blumberg, Frederick Wilson, Marius De Groot, Daniel C. Alexander, Neil Oxtoby, Joseph Jacob

Memory-efficient Segmentation for Volumetric High-resolution MicroCT Images
Yuan Wang, Laura Blackie, Irene Miguel-Aliaga, Wenjia Bai *(virtual presentation)*

GALA DINNER

The event most attendees look forward to, this year's Gala will be held in the stunning Gasthaus Albisgütli at the foot of the Uetliberg with a unique view of the city of Zurich, the lake and the mountains since 1839.

With its renovation in 2020, Gasthaus Albisgütli brings a new world of experience for all the senses, in which traditions and treasures have been preserved, but modernity and comfort find their place.

We are looking forward to welcoming you at the Gasthaus Albisgütli to enjoy a unique night out in this iconic venue.

Venue:
Gasthaus Albisgütli
Uetlibergstrasse 341
8045 Zurich

Time:
18:00 - 22:00

09:40 - 10:40 Oral Session 3.1: Trustworthy AI

VORTEX: Physics-Driven Data Augmentations Using Consistency Training for Robust Accelerated MRI Reconstruction
Arjun D Desai, Beliz Gunel, Batu Ozturkler, Harris Beg, Shreyas Vasanawala, Brian Hargreaves, Christopher Re, John M. Pauly, Akshay Chaudhari

Segmentation-Consistent Probabilistic Lesion Counting
Julien Schroeter, Chelsea Myers-Colet, Douglas Arnold, Tal Arbel

Transformer-based Out-of-distribution Detection for Clinically Safe Segmentation
Mark S Graham, Petru-Daniel Tudosiu, Paul Wright, Walter Hugo Lopez Pinaya, Jean-Marie U-King-Im, Yee Mah, James Teo, Rolf H. Jäger, David Werring, Parashkev Nachev, Sebastien Ourselin, M. Jorge Cardoso *(virtual presentation)*

An Analysis of the Impact of Annotation Errors on the Accuracy of Deep Learning for Cell Segmentation
Șerban Vădineanu, Daniel Pelt, Oleh Dzyubachyk, Joost Batenburg

10:40 - 11:00 Coffee Break

11:00 -12:00 Poster Session 3.1: Learning with Noisy Labels, Unsupervised and Representation Learning & Registration *(virtual)*

Long Papers

Semi-Supervised Medical Image Segmentation via Cross Teaching between CNN and Transformer
Xiangde Luo,Minhao Hu,Tao Song,Guotai Wang,Shaoting Zhang

Towards IID representation learning and its application on biomedical data
Jiqing Wu,Inti Zlobec,Maxime W Lafarge,Yukun He,Viktor Koelzer

Unsupervised Pre-training Improves Tooth Segmentation in 3-Dimensional Intraoral Mesh Scans
Xiaoxuan He,Hualiang Wang,Haoji Hu,Jianfei Yang,Yang Feng,Gaoang Wang,Zuozhu Liu

Self-Supervised Representation Learning for High-Content Screening
Daniel Siegismund,Mario Wieser,Stephan Heyse,Stephan Steigele

Self-Supervised Transformers for fMRI representation
Itzik Malkiel,Gony Rosenman,Lior Wolf,Talma Hendler

Position Regression for Unsupervised Anomaly Detection
Florentin Bieder,Julia Wolleb,Robin Sandkuehler,Philippe C. Cattin

Orientation Estimation of Abdominal Ultrasound Images with Multi-Hypotheses Networks
Timo Horstmann,Oliver Zettinig,Wolfgang Wein,Raphael Prevost

Cell Anomaly Localisation using Structured Uncertainty Prediction Networks
Boyko Vodenicharski,Samuel McDermott,K M Webber,Viola Introini,Richard Bowman,Pietro Cicuta,Ivor J A Simpson,Neill D. F. Campbell

Weakly-supervised learning for image-based classification of primary melanomas into genomic immune subgroups
Lucy Godson,Navid Alemi,Jeremie Nsengimana,Graham Cook,Emily L Clarke,Darren Treanor,D Timothy Bishop,Julia A Newton-Bishop,Ali Gooya

Short Papers

SIHeDA-Net: Sensor to Image Heterogeneous Domain Adaptation Network
Ishikaa Lunawat,Vignesh S,S P Sharan

Continuous benchmarking in medical image registration - review of the current state of the Learn2Reg challenge
Lasse Hansen,Alessa Hering,Christoph Großbröhmer,Mattias P Heinrich

A Generative Model Reveals the Influence of Patient Attributes on Fundus Images
Sarah Müller,Lisa M. Koch,Hendrik Lensch,Philipp Berens

Weak labels for deep-learning-based detection of brain aneurysms from MR angiography scans
Tommaso Di Noto,Guillaume Marie,Sebastien Tourbier,Yasser Alemán-Gómez,Oscar Esteban,Guillaume Saliou,Meritxell Bach Cuadra,Patric Hagmann,Jonas Richiardi

Physically Informed Neural Network for Non-Invasive Arterial Input Function Estimation In Dynamic PET Imaging
Matteo Ferrante,Marianna Inglese,Ludovica Brusaferri,Alexander Whitehead,Marco Loggia,Nicola Toschi

Domain Shift as a Confounding Variable in Unsupervised Pathology Detection
Felix Meissen,Ioannis Lagogiannis,Georgios Kaissis,Daniel Rueckert

Fast deformable image registration uncertainty estimation for contour propagation in daily adaptive proton therapy
Andreas Smolders,Florian Amstutz,Ye Zhang,Damien Charles Weber,Tony Lomax,Francesca Albertini

Constrative Learning for Kidney Transplant Analysis using MRI data and Deep Convolutional Networks
Leo Milecki,Vicky Kalogeiton,Sylvain Bodard,Dany Anglicheau,Jean-Michel Correas,Marc-Olivier Timsit,Maria Vakalopoulou

Reference-less SSIM Regression for Detection and Quantification of Motion Artefacts in Brain MRIs
Alessandro Sciarra,Soumick Chatterjee,Max Dünnwald,Giuseppe Placidi,Andreas Nürnberger,Oliver Speck,Steffen Oeltze-Jafra

The effect of skull-stripping on transfer learning for 3D MRI models: ADNI data
Polina Druzhinina,Ekaterina Kondrateva

Self-supervised Methods for Ugly Duckling Detection in Wide Field Images Vullnet Useini,Nicolaus Andratschke,Stephanie Tanadini-Lang,Quentin Lohmeyer,Ralph P. Braun,Javier Barranco Garcia

Handcrafted Histological Transformer (H2T): A Brief Introduction
Dang Quoc Vu,Kashif Rajpoot,SHAN E AHMED RAZA,Nasir Rajpoot

Semantic analysis of real endoscopies with unsupervised learned descriptors
O. León Barbed,Cristina Oriol,Pablo Azagra Millán,Ana C Murillo

11:00 - 12:00 Poster Session 3.2: Computer Assisted Diagnosis, Domain Adaptation and Model Generalization, Data-Efficient Learning *(onsite)*

Long Papers

MAF-Net: Multi-branch Anchor-Free Detector for Polyp Localization and Classification in Colonoscopy
Xinzi Sun,Dechun Wang,Qilei Chen,Jing Ni,Shuijiao Chen,Xiaowei Liu,Yu Cao,Benyuan Liu

Hierarchical Optimal Transport for Comparing Histopathology Datasets
Anna Yeaton,Rahul G Krishnan,Rebecca Mieloszyk,David Alvarez-Melis,Grace Huynh

LILE: Look In-Depth before Looking Elsewhere -- A Dual Attention Network using Transformers for Cross-Modal Information Retrieval in Histopathology Archives
Danial Maleki,Hamid Tizhoosh

Attention-Guided Prostate Lesion Localization and Grade Group Classification with Multiple Instance Learning
Ekaterina Redekop,Karthik V. Sarma,Adam Kinnaird,Anthony Sisk,Steven S. Raman,Leonard S. Marks,William Speier,Corey W. Arnold

CAD-RADS Scoring using Deep Learning and Task-Specific Centerline Labeling
Felix Denzinger,Michael Wels,Oliver Taubmann,Mehmet Akif Gülsün,Max Schöbinger,Florian André,Sebastian Buß,Johannes Görich,Michael Suehling,Andreas Maier,Katharina Breininger

Hidden in Plain Sight: Subgroup Shifts Escape OOD Detection
Lisa M. Koch,Christian M. Schürch,Arthur Gretton,Philipp Berens

Interpretable and Interactive Deep Multiple Instance Learning for Dental Caries Classification in Bitewing X-rays
Benjamin Bergner,Csaba Rohrer,Aiham Taleb,Martha Duchrau,Guilherme De Leon,Jonas Almeida Rodrigues,Falk Schwendicke,Joachim Krois,Christoph Lippert

Unsupervised Domain adaptation for medical image segmentation via self-supervised refinement of early features
Rasha Sheikh,Thomas Schultz

Structural Networks for Brain Age Prediction
Oscar Pina,Irene Cumplido-Mayoral,Raffaele Cacciaglia,José María González-de-Echávarri,Juan Domingo Gispert,Veronica Vilaplana

Deep Learning for Analyzing the Proliferation of Postnatal Cardiomyocytes in Confocal Microscopy Imaging Data
Lars Leyendecker,Julius Haas,Tobias Piotrowski,Maik Frye,Cora Becker,Bernd K. Fleischmann,Michael Hesse,Robert H. Schmitt

ECONet: Efficient Convolutional Online Likelihood Network for Scribble-based Interactive Segmentation
Muhammad Asad,Lucas Fidon,Tom Vercauteren

Short Papers

Transfer Learning Promotes Robust Parametric Mapping of Diffusion Encoded MR Fingerprinting
Alan Finkelstein,Congyu Liao,Xiaozhi Cao,Jianhui Zhong

Automatic Extraction of Spinopelvic Parameters Using Deep Learning to Detect Landmarks as Objects
AliAsghar MohammadiNasrabadi,William McNally,Gemah Moammer,John McPhee

Source-Free Domain Adaptation for Image Segmentation
Mathilde Bateson,Hoel Kervadec,Jose Dolz,Herve Lombaert,Ismail Ben Ayed

Predicting Thrombectomy Recanalization from CT Imaging Using Deep Learning Models
Haoyue Zhang,Jennifer Polson,Eric J Yang,Kambiz Nael,William Speier,Corey W. Arnold

Graph Attention Network for Prostate Cancer Lymph Node Invasion Prediction
Maxence Larose,Nawar Touma,Nicolas Raymond,Danahé LeBlanc,Fatemeh Rasekh,Bertrand Neveu,Hélène Hovington,Martin Vallières,Frédéric Pouliot,Louis Archambault

Focal loss improves repeatability of deep learning models
Syed Rakin Ahmed,Andreanne Lemay,Katharina V Hoebel,Jayashree Kalpathy-cramer

Efficient Transfer Learning for Cardiac landmark Localization Using Rotational Entropy
Samira Masoudi,Kevin Blansit,Naeim Bahrami,Albert Hsiao

Energy Efficiency of Quantized Neural Networks in Medical Imaging
Priyanshu Sinha,Sai Sreya Tummala,Saptarshi Purkayastha,Judy Gichoya

3D convolutional neural networks for outcome prediction in glioblastoma using methionine PET and T1w MRI
Iram Shahzadi,Annekatrin Seidlitz,Alex Zwanenburg,Bettina Beuthien-Baumann,Ivan Platzek,Jörg Kotzerke,Michael Baumann,Mechthild Krause,Steffen Löck

Convolutional neural networks predict the linear energy transfer for proton-beam radiotherapy of patients with brain tumours
Sebastian Starke,Jan Eulitz,Alex Zwanenburg,Esther G.C. Troost,Mechthild Krause,Armin Lühr,Steffen Löck

A vertebral compression fracture score based on deep generative contextual modeling
Michel Botros,Matthieu Rutten,Twan van Laarhoven,Nikolas Lessmann

Toward Automatic Tumor-Stroma Ratio Assessment for Survival Analysis in Colorectal Cancer
Christian Abbet,Linda Studer,Inti Zlobec,Jean-Philippe Thiran

Stain Isolation-based Guidance for Improved Stain Translation
Nicolas Brieu,Felix J. Segerer,Ansh Kapil,Philipp Wortmann,Günter Schmidt

Towards more efficient tumor follow-up assessment using AI assistance
Alessa Hering,Felix Peisen,Jan Hendrik Moltz

A Simple but Effective Training Process for the Few-shot Prediction Task of Early Rheumatoid Arthritis from MRI
Yanli Li,Denis P. Shamonin,Tahereh Hassanzadeh,Monique Reijnierse,Annette H.M. van der Helm-van Mil,Berend Stoel

Improving CCE video review time with a model based on frame similarity
Pere Gilabert,Santi Seguí

Automated L3-based sarcopenia quantification in CT scans
Othmane Laousy,Guillaume Chassagnon,Nikos Paragios,Marie-Pierre Revel,Maria Vakalopoulou

Pulmonary Embolus Detection with Dual-Energy CT Data Augmentation
Cornelia Hofsäß,Roman Johannes Gertz,Tanja Lossau,Jens-Peter M. Zemke,-Tobias Klinder,Alexander C. Bunck,Hannes Nickisch

Automated Analysis of Mitral Inflow Doppler using Convolutional Neural Networks
Jevgeni Jevsikov,Elisabeth Sarah Lane,Catherine C Stowell,Matthew J Shun-shin,Darrel P Francis,Massoud Zolgharni

Two-Year Overall Survival Prediction in Non–Small-Cell Lung Cancer Patients Using Pre-Treatment Computed Tomography Images and Deep Neural Networks: A Multicentric Study
Zahra Khodabakhshi,Habib Zaidi,Isaac Shiri,Nicolaus Andratschke,Stephanie Tanadini-Lang

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Artificial Intelligence for Healthcare

With more than 30 years of history in machine learning, deep learning, artificial intelligence, and innovative technologies, the Siemens Healthineers Artificial Intelligence and Digital Innovation Center specializes in building AI solutions for healthcare. Our research has been translated into multiple differentiating and award-winning products and solutions for imaging, diagnostics, and cancer therapy. Our footprint spans across the globe from our primary location in Princeton, New Jersey, to India, China, and Europe, incl. France, Germany and Romania. Discover more about how we innovate, and join us on our journey to pioneer breakthroughs in healthcare.

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SIEMENS Healthineers

12:00- 12:20 Lunch Event of Sponsor Align Technology *(virtual)*

13:20 - 14:00 Oral Session 3.2: Computer Aided Detection and Diagnosis

Personalized Prediction of Future Lesion Activity and Treatment Effect in Multiple Sclerosis from Baseline MRI
Joshua D. Durso-Finley, Jean-Pierre René Falet, Brennan Nichyporuk, Douglas Arnold, Tal Arbel

Regularizing Brain Age Prediction via Gated Knowledge Distillation
Yanwu Yang, Guo Xutao, Chenfei Ye, Yang Xiang, Ting Ma *(virtual presentation)*

Survival Analysis for Idiopathic Pulmonary Fibrosis using CT Images and Incomplete Clinical Data
Ahmed H. Shahin, Joseph Jacob, Daniel C. Alexander, David Barber

14:00 - 15:00 Keynote: Prof. Dr. Klaas P. Prüssmann

15:00 - 15:20 Coffee Break

15:20 - 16.20 Poster Session 3.1: Learning with Noisy Labels, Unsupervised and Representation Learning & Registration *(onsite)*
Poster Session 3.2: Computer Assisted Diagnosis, Domain Adaptation and Model Generalization, Data-Efficient Learning *(virtual)*

16:20 - 17:20 Oral Session 3.3: Data Efficient Learning

MedSelect: Selective Labeling for Medical Image Classification Using Meta-Learning
Damir Vrabac, Akshay Smit, Yujie He, Andrew Y. Ng, Andrew Beam, Pranav Rajpurkar *(virtual presentation)*

Differentiable Boundary Point Extraction for Weakly Supervised Star-shaped Object Segmentation
Robin Camarasa, Hoel Kervadec, Daniel Bos, Marleen de Bruijne

ECONet: Efficient Convolutional Online Likelihood Network for Scribble-based Interactive Segmentation
Muhammad Asad, Lucas Fidon, Tom Vercauteren

EfficientCellSeg: Efficient Volumetric Cell Segmentation Using Context Aware Pseudocoloring
Royden Wagner, Karl Rohr

17:20 - 18:00 Awards & Closing Ceremony

VENUE LOCATION & TRANSPORT

The conference will take place at the central campus of ETH Zurich (main campus, HG).

From the "Bahnhofquai/HB" stop
Tram no. 6 (towards the Zoo) as far as the "ETH/Universitätsspital" stop. Journey time: approx. 6 minutes

From the "Bahnhofstrasse/HB" stop
Tram no. 10 (towards the Airport or Oerlikon station) as far as the "ETH/Universitätsspital" stop

From the "Bahnhofplatz/HB" stop
Tram Nr. 3 (towards Klusplatz) as far as the "Central" stop (1 stop), from "Central" by Polybahn (departs every three minutes) to the Polyterrasse. Journey time: approx. 8 minutes

You will require a ticket that is valid for zone 110 (city of Zurich).

From Zurich Airport

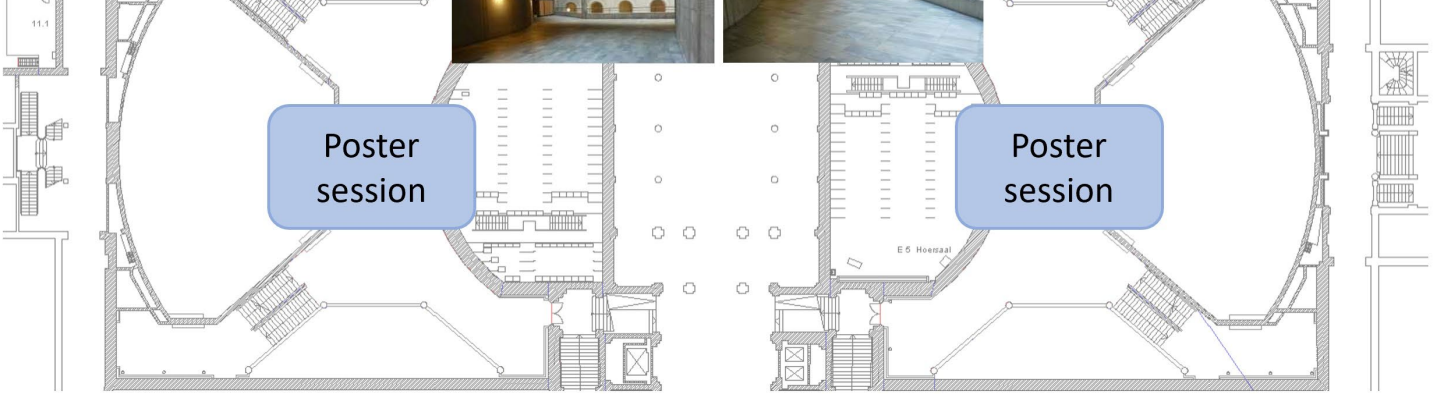
From the "Zurich Airport" tram stop
Tram no. 10 (towards Bahnhofplatz/HB) as far as the "ETH/Universitätsspital" stop. The tram runs every 7 to 15 minutes between 6 o'clock in the morning and 11 o'clock at night.
Journey time: 30 minutes

By train
If you wish to travel from the airport to the city center (Central Station), you are recommended to use the S-Bahn or mainline services. The trains depart from the "Zurich Airport" station.
Journey time: approx. 10 minutes

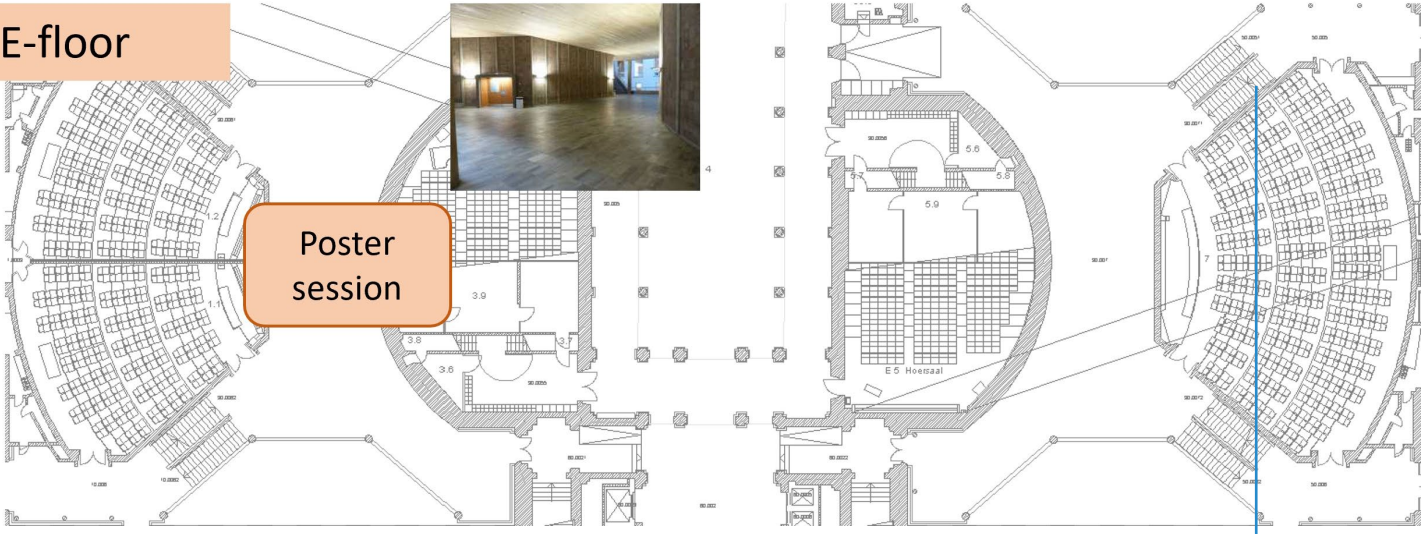
SITE MAP

F-floor

EO-floor


Poster session
Poster session
E5 Hoorsaal

E-floor


Poster session
E5 Hoorsaal

VENUE DETAILS

Conference Room @ ETH Main Building, Audimax

The conference venue takes place at the ETH Main Building, with its flexible, multi-purpose space. Oral sessions take place at the Audimax. With its theatre space, it provides seating up to 422 attendees in theatre mode.

Poster Room @ ETH Main Building

The poster sessions will take place in the foyers E, EO North and South and Foyer/gallery F of the ETH Main Building.

Coffee Breaks & Lunches

Coffee breaks and lunches are included in the registration fee. During the coffee breaks light snacks will be available. Coffee breaks and lunches will be served in ETH main hall.
Lunch will be served at the ETH Mensa and other ETH restaurants.

ImFusion

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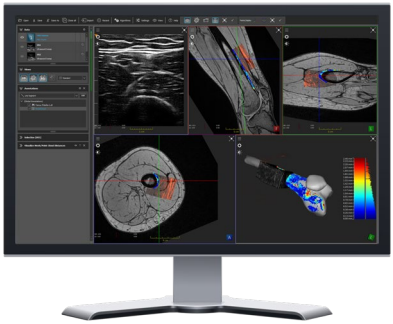

ImFusion Suite

Complete software framework for medical image analysis focused on high-performance and versatility.

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Create your own applications

Python Integration

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import imfusion as imf
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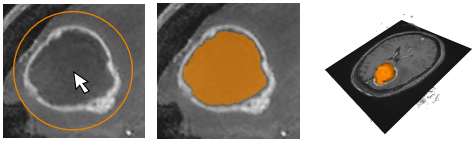
ImFusion Labels

Provides a user-friendly and powerful way of annotating medical data, managing a database of labelled images and exporting it in a standardized manner.



Free demo available
for Windows, Ubuntu, MacOS
www.imfusion.com/download

Visit our virtual booth
or come meet us at the conference!

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PROGRAM AT A GLANCE

	July 6th	July 7th	July 8th
08:00		Sports Event	
08:30	Registration, Poster Setup		
09:40	Welcome	Oral 2.1	Oral 3.1
10:00	Oral 1.1		
10:40	Coffee Break		
11:00	Poster 1.1 / 1.2	Poster 2.1 / 2.2	Poster 3.1 / 3.2
12:00	Sponsor Event		
12:20	Sponsor Event	Lunch	
12:40	Lunch		
13:20	Oral 1.2	Oral 2.2	Oral 3.2
14:00	Keynote 1	Keynote 2	Keynote 3
15:00	Coffee Break		
15:20	Poster 1.2 / 1.1	Poster 2.2 / 2.1	Poster 3.2 / 3.1
16:20	Oral 1.3	Oral 2.3	Oral 3.3
17:20	Get together		Awards & Closing Ceremony
18:00		Gala Dinner	
22:00