

MIDL

London 2019

Conference Book



 **KHEIRON**
MEDICAL TECHNOLOGIES

 Google AI

 IBM



 Microsoft



 **MIRADA**
The Imaging Software People

 ImFusion

 **DEFINIENS**
the tissue phenomics company
promoton



 HeartFlow®

TABLE OF CONTENTS



INTRODUCTION

CONFERENCE AT A GLANCE	4
MESSAGE FROM THE CHAIRS	5

PROGRAM

KEYNOTE SPEAKERS	6
WEDNESDAY	8
ORAL SESSIONS	8
POSTER SESSIONS	10
RECEPTION AND WELCOME DINNER	13
THURSDAY	15
ORAL SESSION	15
POSTER SESSION	16
GALA DINNER	20
FRIDAY	18
ORAL SESSION	18
POSTER SESSION	20

PRACTICALITIES

VENUE LOCATION & TRANSPORT	26
SITE MAP	27
VENUE DETAILS	29

ORGANISATION

ORGANISING COMMITTEE	30
THANKS	31
SPONSORS	32
AREA CHAIRS	33
REVIEWERS	34

INTRODUCTION

CONFERENCE AT A GLANCE

Monday, 8th July

08:30	09:30	Registration, Welcome Coffee & Poster Setup
09:30	10:00	Opening & Best Paper Award
10:00	11:00	Keynote 1 <i>Michael Bronstein</i>
11:00	11:30	Coffee Break
11:30	13:00	Oral Session 1 <i>Learning good representations</i>
13:00	14:30	Lunch
14:30	15:00	Oral Session 2 <i>Learning from unbalanced samples</i>
16:00	16:30	Coffee Break
16:30	18:00	Poster Session 1
18:00	20:00	Drinks Reception @ Queen's Tower Rooms

Tuesday, 9th July

08:30	09:00	Registration, Coffee & Poster Setup
09:00	10:00	Keynote 2 <i>Muyinatu Bell</i>
10:00	11:00	Oral Session 3 <i>Adversarial training</i>
11:00	11:30	Coffee Break
11:30	13:00	Oral Session 4 <i>Weak and Unsupervised Learning</i>
13:00	14:30	Lunch
14:30	16:00	Oral Session 5 <i>Synthesis</i>
16:00	16:30	Coffee Break
16:30	18:00	Poster Session 2
18:45	23:00	Gala Dinner @ Victoria & Albert Museum

Wednesday, 10th July

08:30	09:00	Registration, Coffee & Poster Setup
09:00	10:00	Keynote 3 <i>Pearse Keane</i>
10:00	11:00	Oral Session 6 <i>Reconstruction</i>
11:00	11:30	Coffee Break
11:30	13:00	Poster Session 3
13:00	14:30	Lunch
14:30	16:00	Orals Session 7 <i>Structured outputs</i>
16:00	16:30	Closing & Best Poster Awards

MESSAGE FROM THE CHAIRS

Many conferences cover either medical imaging or machine learning. Although many of them do cover the application of deep learning to medical imaging, most explicitly through satellite events like workshops, MIDL is currently the only international venue which brings deep learning and medical imaging researchers together for in-depth discussion and exchange of ideas. With hundreds of deep learning papers being published in the field of medical imaging, and numerous AI-based startups in the medical field appearing, we believe such a venue is needed.

MIDL is a forum for deep learning researchers, clinicians and healthcare companies to take a leap in the application of deep learning based automatic image analysis in disease screening, diagnosis, prognosis, surgical planning, interventional guidance, treatment selection and treatment monitoring. The conference has a broad scope and include topics such as computer-aided screening and diagnosis, intervention, detection, segmentation, registration, image reconstruction and synthesis. Furthermore, we discuss issues regarding the lack of curated, annotated datasets, noisy reference standards and the high-dimensionality of medical data. Software toolkits, presentation of medical data sets and innovative clinical applications are also covered as focus points for integration of deep learning algorithms in clinical practice.

The 3-day scientific program includes keynote presentations from invited speakers, oral presentations, and posters.

Through the OpenReview system, 117 full paper and 158 extended abstract submissions were received. For both tracks, the review process was single blind by default but the authors were also given the option to keep their identities anonymous. All submitted papers were on display at the OpenReview system from the time of their submission.

All reviews and rebuttals were made publicly available after the decision process. The final acceptance rate of the full paper tract was 40.2%. Among the 47 accepted full paper articles, 19 were selected as oral presentations (16.2% of all submissions), based on reviewer and AC proposals, and 28 for poster presentations.

Acknowledging the benefits of sharing novel ideas at their infancy, at MIDL 2019, extended abstract submissions were reviewed with a more lightweight process. The focus of the review was put on the potential for encouraging constructive and thought-provoking discussions at the conference. The acceptance rate for the extended abstract track was kept higher than for the full papers to encourage a wide representation of the field. 104 out of 158 submissions (65.8% acceptance rate), who had an average score of accept, were accepted as extended abstracts and will be presented as posters at the conference.

The PC and organising chairs would like to thank the OpenReview staff for their support in hosting the submission site and PMLR staff for their support in finalising these proceedings.

Most importantly, we would like to thank our Area Chairs, and Reviewers for their hard work in preparing and helping us shape the final technical program of MIDL 2019. The conference and the current proceedings are a result of their work.

Finally, we would like to thank all our sponsors for the financial support, which made the MIDL 2019 conference possible.

Thank you for coming to London, and we look forward to seeing you in Montreal, Canada, in 2020 for the next edition of MIDL!



Tom Vercauteren
Ben Glocker
M Jorge Cardoso
MIDL Conference Chairs



Ipek Oguz
Ender Konukoglu
Aasa Feragen
Gozde Unal
MIDL Program Chairs

PROGRAM

KEYNOTE SPEAKERS

Monday at 10AM

Prof. Michael Bronstein,
Imperial College London



Abstract

In the past decade, deep learning methods have achieved unprecedented performance on a broad range of problems in various fields from computer vision to speech recognition. So far research has mainly focused on developing deep learning methods for Euclidean-structured data. However, many important applications have to deal with non-Euclidean structured data, such as graphs and manifolds. Such data are becoming increasingly important in computer graphics and 3D vision, sensor networks, drug design, biomedicine, high energy physics, recommendation systems, and social media analysis. The adoption of deep learning in these fields has been lagging behind until recently, primarily since the non-Euclidean nature of objects dealt with makes the very definition of basic operations used in deep networks rather elusive. In this talk, I will introduce the emerging field of geometric deep learning on graphs and manifolds, overview existing solutions and outline the key difficulties and future research directions. As examples of applications, I will show problems from the domains of computer vision, graphics, medical imaging, and protein science.

Biography

Michael Bronstein is a professor at Imperial College London, where he holds the Chair in Machine Learning and Pattern Recognition, and Head of Graph Learning Research at Twitter. His main research expertise is in theoretical and computational methods for geometric data analysis, a field in which he has published extensively in the leading journals and conferences. He is credited as one of the pioneers of geometric deep learning, generalizing machine learning methods to graph-structured data. Michael received his PhD from the Technion (Israel Institute of Technology) in 2007. He has held visiting appointments at Stanford, MIT, Harvard, and Tel Aviv University. During 2017–2018 he was a fellow at the Radcliffe Institute for Advanced Study at Harvard University. Since 2017, he is a Rudolf Diesel fellow at the Institute for Advanced Study, TU Munich. Michael is the recipient of four ERC grants, Fellow of IEEE and IAPR, ACM Distinguished Speaker, and World Economic Forum Young Scientist. His industrial experience includes technological leadership in multiple startup companies, including Novafora, Invision (acquired by Intel in 2012) and Fabula AI (acquired by Twitter in 2019). He has previously served as Principal Engineer at Intel Perceptual Computing.

Tuesday at 9AM

Prof. Muyinatu Bell,
Johns Hopkins University

Abstract

The success of many diagnostic and interventional procedures is deeply rooted in the ability of modern medical imaging systems to deliver clear and interpretable information. In ultrasound and photoacoustic imaging, the beamforming process is typically the first line of software defense against poor quality images. Yet, with today's state-of-the-art beamformers, ultrasound and photoacoustic images remain challenged by channel noise, reflection artifacts, and acoustic clutter, which combine to complicate segmentation tasks and confuse overall image interpretation. This talk will introduce the PULSE Lab's novel alternative to beamforming, which improves ultrasound and photoacoustic image quality by learning from the physics of sound propagation in tissue. We take raw data received by our ultrasound and photoacoustic imaging systems and bypass traditional beamforming and image formations steps, which are based on flawed assumptions in the presence of significant inter- and intrapatient variations. Instead, we replace these steps with a well trained deep neural network that only displays segmented structures of interest. Our pioneering image formation methods hold promise for robotic tracking tasks, visualization and visual servoing of surgical tool tips, and assessment of relative distances between the surgical tool and nearby critical structures (e.g., major blood vessels and nerves that if injured will cause severe complications, paralysis, or patient death). Impacted surgeries and procedures include cardiac catheterization, neurosurgery, spinal fusion surgery, hysterectomies, and biopsies.

Biography

Muyinatu Bell is an Assistant Professor of Electrical and Computer Engineering, Biomedical Engineering, and Computer Science at Johns Hopkins University, where she founded and directs the Photoacoustic and Ultrasonic Systems Engineering (PULSE) Lab. Dr. Bell earned a B.S. degree in Mechanical Engineering (biomedical engineering minor) from Massachusetts Institute of Technology (2006), received a Ph.D. degree in Biomedical Engineering from Duke University (2012), conducted research abroad as a Whitaker International Fellow at the Institute of Cancer Research and Royal Marsden Hospital in the United Kingdom (09–10), and completed a postdoctoral fellowship with the Engineering Research Center for Computer-Integrated Surgical Systems and Technology at Johns Hopkins University (2016). She has published over 60 scientific journal articles and conference papers, holds a patent for short-lag spatial coherence beamforming, and is the recipient of numerous awards, grants, and fellowships, including the NIH K99/R00 Pathway to Independence Award (2015), MIT Technology Review's Innovator Under 35 Award (2016), NSF CAREER Award (2018), NIH Trailblazer Award (2018), Alfred P. Sloan Research Fellowship (2019), Maryland's Outstanding Young Engineer Award (2019), and ORAU Ralph E. Powe Junior Faculty Enhancement Award (2019).



Wednesday at 9AM**Dr. Pearse Keane,
Moorfields Eye Hospital****Abstract**

Ophthalmology is among the most technology-driven of all the medical specialties, with treatments utilizing high-spec medical lasers and advanced microsurgical techniques, and diagnostics involving ultra-high resolution imaging. Ophthalmology is also at the forefront of many trailblazing research areas in healthcare, such as stem cell therapy, gene therapy, and – most recently – artificial intelligence. In July 2016, Moorfields Eye Hospital announced a formal collaboration with DeepMind to apply deep learning to optical coherence tomography (OCT) images for the diagnosis of retinal diseases such as age-related macular degeneration (AMD) and diabetic retinopathy (DR). This presentation will describe the motivation – and urgent need – to apply deep learning to ophthalmology, the processes required to establish a research collaboration between the NHS and a company like DeepMind, the initial results of this research programme, and finally, why ophthalmology could be first branch of medicine to be fundamentally reinvented through the application of artificial intelligence.

Biography

Pearse A. Keane, MD, FRCOphth, is a consultant ophthalmologist at Moorfields Eye Hospital, London and an NIHR Clinician Scientist, based at the Institute of Ophthalmology, University College London (UCL). Dr Keane specialises in applied ophthalmic research, with a particular interest in retinal imaging and new technologies. In April 2015, he was ranked no. 4 on a worldwide ranking of ophthalmologists under 40, published in "the Ophthalmologist" journal (<https://theophthalmologist.com/the-power-list-2015/>). In 2016, he initiated a formal collaboration between Moorfields Eye Hospital and Google DeepMind, with the aim of applying machine learning to automated diagnosis of optical coherence tomography (OCT) images. In August 2018, the first results of this collaboration were published in the journal, Nature Medicine.

PROGRAM

MONDAY

11:30-13:00 – Oral session 1: Learning good representations

11:30 Exploring Local Rotation Invariance in 3D CNNs with Steerable Filters

Vincent Andrearczyk, Julien Fageot, Valentin Oreiller, Xavier Montet, Adrien Depeursinge

11:53 SPDA: Superpixel-based Data Augmentation for Biomedical Image Segmentation

Yizhe Zhang, Lin Yang, Hao Zheng, Peixian Liang, Colleen Mangold, Raquel G. Loreto, David P. Hughes, Danny Z. Chen

12:16 Learning Interpretable Multi-modal Features for Alignment with Supervised Iterative Descent

Max Blendowski, Matthias P. Heinrich

12:39 3-minute spotlights for full paper posters

AnatomyGen: Deep Anatomy Generation from Dense Representation with Applications in Mandible Synthesis

Amir H. Abdi, Heather Borgard, Purang Abolmaesumi, Sidney Fels

Group-Attention Single-Shot Detector (GA-SSD): Finding Pulmonary Nodules in Large-Scale CT Images

Jiechao Ma, Xiang Li, Hongwei Li, Bjoern H Menze, Sen Liang, Rongguo Zhang, Wei-Shi Zheng

XLSor: A Robust and Accurate Lung Segmentor on Chest XRays Using Criss-Cross Attention and Customized Radiorealistic Abnormalities Generation

You-Bao Tang, Yu-Xing Tang, Jing Xiao, Ronald M. Summers

High-quality Segmentation of Low Quality Cardiac MR Images Using K-space Artefact Correction

Illkay Oksuz, James Clough, Wenjia Bai, Bram Ruijsink, Esther PuyolAntón, Gastao Cruz, Claudia Prieto, Andrew P. King, Julia A. Schnabel

Capturing Single-Cell Phenotypic Variation Via Unsupervised Representation Learning

Maxime W. Lafarge, Juan C. Caicedo, Anne E. Carpenter, Josien P.W. Pluim, Shantanu Singh, Mitko Veta

14:30-16:00 – Oral session 2: Learning from unbalanced samples

14:30 3D Multirater RCNN for Multimodal Multiclass Detection and Characterisation of Extremely Small Objects

Carole H. Sudre, Beatriz Gomez Anson, Silvia Ingala, Chris D. Lane, Daniel Jimenez, Lukas Haider, Thomas Varsavsky, Lorna Smith, Sébastien Ourselin, Rolf H Jäger, M. Jorge Cardoso

14:53 Exclusive Independent Probability Estimation Using Deep 3D Fully Convolutional DenseNets: Application to Isointense Infant Brain MRI Segmentation

Seyed Raein Hashemi, Sanjay P. Prabhu, Simon K. Warfield, Ali Gholipour

15:16 Boundary Loss for Highly Unbalanced Segmentation

Hoel Kervadec, Jihene Bouchtiba, Christian Desrosiers, Eric Granger, Jose Dolz, Ismail Ben Ayed

15:39 3-minute spotlights for full paper posters

MRI K-space Motion Artefact Augmentation: Model Robustness and Task-Specific Uncertainty

Richard Shaw, Carole Sudre, Sébastien Ourselin, M. Jorge Cardoso

Fusing Unsupervised and Supervised Deep Learning for White Matter Lesion Segmentation

Christoph Baur, Benedikt Wiestler, Shadi Albarqouni, Nassir Navab

VOCA: Cell Nuclei Detection In Histopathology Images By Vector Oriented Confidence Accumulation

Chensu Xie, Chad M. Vanderbilt, Anne Grabenstetter, Thomas J. Fuchs

Learning Beamforming in Ultrasound Imaging

Sanketh Vedula, Ortal Senouf, Grigoriy Zurakhov, Alex Bronstein, Oleg Michailovich, Michael Zibulevsky

Neural Processes Mixed-Effect Models for Deep Normative Modeling of Clinical Neuroimaging Data

Seyed Mostafa Kia, Andre F. Marquand

Our mission is to help
radiologists detect breast cancer
earlier using deep learning

KHEIRON MEDICAL TECHNOLOGIES

is proud to be Platinum Sponsor of [MIDL 2019](#)

Visit us at Booth C to find out more
about our [award winning software](#)
and [career opportunities](#)

www.kheironmed.com



2019 EuroMinnies
Best New Radiology Software



CogX 2019 Innovation Awards
Best AI Product in Health



KHEIRON
MEDICAL TECHNOLOGIES

PROGRAM

16:30-18:00 – Poster session 1

Oral presentation posters

O-M-1 Exploring Local Rotation Invariance in 3D CNNs with Steerable Filters

Vincent Andrarczyk, Julien Fageot, Valentin Oreiller, Xavier Montet, Adrien Depeursinge

O-M-2 SPDA: Superpixel-based Data Augmentation for Biomedical Image Segmentation

Yizhe Zhang, Lin Yang, Hao Zheng, Peixian Liang, Colleen Mangold, Raquel G. Loreto, David P. Hughes, Danny Z. Chen

O-M-3 Learning Interpretable Multi-modal Features for Alignment with Supervised Iterative Descent

Max Blendowski, Mattias P. Heinrich

O-M-4 3D Multirater RCNN for Multimodal Multiclass Detection and Characterisation of Extremely Small Objects

Carole H. Sudre, Beatriz Gomez Anson, Silvia Ingala, Chris D. Lane, Daniel Jimenez, Lukas Haider, Thomas Varsavsky, Lorna Smith, Sébastien Ourselin, Rolf H Jäger, M. Jorge Cardoso

O-M-5 Exclusive Independent Probability Estimation Using Deep 3D Fully Convolutional DenseNets: Application to IsoIntense Infant Brain MRI Segmentation

Seyed Raein Hashemi, Sanjay P. Prabhu, Simon K. Warfield, Ali Gholipour

O-M-6 Boundary Loss for Highly Unbalanced Segmentation

Hoel Kervadec, Jihene Bouchtiba, Christian Desrosiers, Eric Granger, Jose Dolz, Ismail Ben Ayed

Full paper posters

F-M-1 AnatomyGen: Deep Anatomy Generation from Dense Representation with Applications in Mandible Synthesis

Amir H. Abdi, Heather Borgard, Purang Abolmaesumi, Sidney Fels

F-M-2 Group-Attention Single-Shot Detector (GA-SSD): Finding Pulmonary Nodules in Large-Scale CT Images

Jiechao Ma, Xiang Li, Hongwei Li, Bjoern H Menze, Sen Liang, Rongguo Zhang, Wei-Shi Zheng

F-M-3 XLSor: A Robust and Accurate Lung Segmentor on Chest XRays Using Criss-Cross Attention and Customized Radiorealistic Abnormalities Generation

You-Bao Tang, Yu-Xing Tang, Jing Xiao, Ronald M. Summers

F-M-4 High-quality Segmentation of Low Quality Cardiac MR Images Using K-space Artefact Correction

Ilkay Oksuz, James Clough, Wenjia Bai, Bram Ruijsink, Esther PuyolAntón, Gastao Cruz, Claudia Prieto, Andrew P. King, Julia A. Schnabel

F-M-5 Capturing Single-Cell Phenotypic Variation Via Unsupervised Representation Learning

Maxime W. Lafarge, Juan C. Caicedo, Anne E. Carpenter, Josien P.W. Pluim, Shantanu Singh, Mitko Veta

F-M-6 MRI K-Space Motion Artefact Augmentation: Model Robustness and Task-Specific Uncertainty

Richard Shaw, Carole Sudre, Sébastien Ourselin, M. Jorge Cardoso

F-M-7 Fusing Unsupervised and Supervised Deep Learning for White Matter Lesion Segmentation

Christoph Baur, Benedikt Wiestler, Shadi Albarqouni, Nassir Navab

F-M-8 VOCA: Cell Nuclei Detection In Histopathology Images By Vector Oriented Confidence Accumulation

Chensu Xie, Chad M. Vanderbilt, Anne Grabenstetter, Thomas J. Fuchs

F-M-9 Learning Beamforming in Ultrasound Imaging

Sanketh Vedula, Ortal Senouf, Grigoriy Zurakhov, Alex Bronstein, Oleg Michailovich, Michael Zibulevsky

Abstract posters (Cont.)**A-M-1 Sequential Rib Labeling and Segmentation in Chest X-Ray Using Mask R-CNN**

Joeran Wessel, Mattias P. Heinrich, Jens von Berg, Astrid Franz, Axel Saalbach

A-M-2 Context-encoding Variational Autoencoder for Unsupervised Anomaly Detection

David Zimmerer, Jens Petersen, Fabian Isensee, Klaus Maier-Hein

A-M-3 Multitask Classification and Segmentation for Cancer Diagnosis in Mammography

Thi-Lam-Thuy Le, Nicolas Thome, Sylvain Bernard, Vincent Bismuth, Fanny Patoureaux

A-M-4 Distance Map Loss Penalty Term for Semantic Segmentation

Francesco Caliva, Claudia Iriondo, Alejandro Morales Martinez, Sharmila Majumdar, Valentina Pedoia

A-M-5 Asymmetric Cascade Networks for Focal Bone Lesion Prediction in Multiple Myeloma

Roxane Licandro, Johannes Hofmanninger, Matthias Perkonigg, Sebastian Rohrich, Marc-André Weber, Markus Wennmann, Laurent Kintzele, Marie Piraud, Bjoern Menze, Georg Langs

A-M-6 Combining 3D U-Net and Bottom-up Geometric Constraints for Automatic Cortical Sulci Recognition

Léonie Borne, Denis Rivière, Jean-François Mangin

A-M-7 Applying Simultaneous Super-resolution and Contrast Synthesis to Routine Clinical Magnetic Resonance Images for Automated Segmentation of Knee Joint Cartilage

Ales Neubert, Pierrick Bourgeat, Jason Wood, Craig Engstrom, Shekhar S. Chandra, Stuart Crozier, Jurgen Fripp

A-M-8 Interpretable Convolutional Neural Networks for Preterm Birth Classification

Irina Grigorescu, Lucilio Cordero-Grande, A David Edwards, Jo Hajnal, Marc Modat, Maria Deprez

A-M-9 Towards End-to-end Image-to-tree for Vasculature Modeling

Manish Sharma, Matthew C. H. Lee, James Batten, Michiel Schaap, Ben Glocker

A-M-10 Deep Learning for Magnetic Resonance Fingerprinting

Solene Girardeau, Ilkay Oksuz, Gastao Cruz, Claudia Pietro Vasquez, Andrew P King, James R Clough

A-M-11 Cortical Parcellation Via Spectral Graph Convolutions

Karthik Gopinath, Christian Desrosiers, Herve Lombaert

A-M-12 From Point Annotations to Epithelial Cell Detection in Breast Cancer Histopathology Using RetinaNet

Caner Mercan, Maschenka Balkenhol, Jeroen van der Laak, Francesco Ciompi

A-M-13 Improving Localization-based Approaches for Breast Cancer Screening Exam Classification

Thibault Fevry, Jason Phang, Nan Wu, S. Gene Kim, Linda Moy, Kyunghyun Cho, Krzysztof J. Geras

A-M-14 HyperDense-Net: A Hyper-densely Connected CNN for Multi-modal Image Segmentation

Jose Dolz, Karthik Gopinath, Jing Yuan, Herve Lombaert, Christian Desrosiers, Ismail Ben Ayed

A-M-15 Deep Learning Segmentation in 2D Echocardiography Using the CAMUS Dataset: Automatic Assessment of the Anatomical Shape Validity

Sarah Leclerc, Erik Smistad, Andreas Ostvik, Frederic Cervenansky, Florian Espinosa, Torvald Espeland, Erik Andreas Rye Berg, Pierre-Marc Jodoin, Thomas Grenier, Carole Lartizien, Lasse Lovstakken, Olivier Bernard

A-M-16 MammoGAN: High-Resolution Synthesis of Realistic Mammograms

Dimitrios Korkinof, Andreas Heindl, Tobias Rijken, Hugh Harvey, Ben Glocker

PROGRAM

Abstract posters (Cont.)

- A-M-17 Forensic Age Estimation with Bayesian Convolutional Neural Networks Based on Panoramic Dental X-ray Imaging**

Walter de Back, Sebastian Seurig, Sebastian Wagner, Birgit Marré, Ingo Roeder, Nico Scherf

- A-M-18 Deformable Medical Image Registration Using a Randomly-Initialized CNN as Regularization Prior**

Max-Heinrich Laves, Sontje Ihler, Tobias Ortmaier

- A-M-19 Metric Learning for Patch Classification in Digital Pathology**

Eu Wern Teh, Graham W. Taylor

- A-M-20 Pulmonary Edema Severity Estimation in Chest Radiographs Using Deep Learning**

Xin Wang, Evan Schwab, Jonathan Rubin, Prescott Klassen, Ruizhi Liao, Seth Berkowitz, Polina Golland, Steven Horng, Sandeep Dalal

- A-M-21 Automated Interpretation of Prenatal Ultrasound Using a Predefined Acquisition Protocol in Resource-limited Countries**

Thomas L. A. van den Heuvel, Chris L. de Korte, Bram van Ginneken

- A-M-22 Integrating Spatial Configuration Into Heatmap Regression Based CNNs for Landmark Localization**

Christian Payer, Darko Štern, Horst Bischof, Martin Urschler

- A-M-23 Total Knee Replacement Prediction Using Structural MRIs and 3D Convolutional Neural Networks**

Tianyu Wang, Kevin Leung, Kyunghyun Cho, Gregory Chang, Cem M. Deniz

- A-M-24 Automatic Prostate and Prostate Zones Segmentation of Magnetic Resonance Images Using Convolutional Neural Networks** Nader Aldoj, Federico Biavati, Miriam Rutz, Florian Michallek, Sebastian Stober, Marc Dewey

- A-M-25 CT Field of View Extension Using Combined Channels Extension and Deep Learning Methods**

Éric Fournié, Matthias Baer-Beck, Karl Stierstorfer

- A-M-26 Dealing With Label Scarcity in Computational Pathology: A Use Case in Prostate Cancer Classification**

Koen Dercksen, Wouter Bulten, Geert Litjens

- A-M-27 Automated Segmentation of Left Ventricle in 2D Echocardiography Using Deep Learning**

Neda Azarmehr, Xujiong Ye, Faraz Janan, James P Howard, Darrel P Francis, Massoud Zolgharni

- A-M-28 Cardio-pulmonary Substructure Segmentation of CT Images Using Convolutional Neural Networks for Clinical Outcome Analysis**

Rabia Haq, Alexandra Hotca, Aditya Apte, Andreas Rimner, Joseph O Deasy, Maria Thor

- A-M-29 Caveats in Generating Medical Imaging Labels from Radiology Reports with Natural Language Processing**

Tobi Olatunji, Li Yao, Ben Covington, Anthony Upton

- A-M-30 MR Image Reconstruction Using Deep Density Priors**

Kerem C Tezcan, Christian F. Baumgartner, Roger Luechinger, Klaas P Pruessmann, Ender Konukoglu

- A-M-31 A Closer Look Onto Breast Density with Weakly Supervised Dense-tissue Masks**

Mickael Tardy, Bruno Sheffer, Diana Mateus

- A-M-32 Odontogenic Cysts and Tumors Detection in Panoramic Radiographs Using Deep Convolutional Neural Network (DCNN)** Tae-Hoon Yong, Sang-Jeong Lee, Won-Jin Yi

- A-M-33 Fully Automatic Binary Glioma Grading Based on Pre-Therapy MRI Using 3D Convolutional Neural Networks**

Milan Decuyper, Roel Van Holen

- A-M-34 Machine Learning with Electroencephalography Features for Precise Diagnosis of Depression Subtypes**

Maria Zelenina, Diana Maria Pinto Prata

RECEPTION & WELCOME DRINKS

The UK's Medical Image Analysis Network (MedIAN) invites all conference participants to join us for a Welcome Reception with Drinks and BBQ on Monday evening. Drinks will be served from 17:30 in the Queen's Tower Rooms transitioning the Monday poster session into a social networking event. A selection of beer, wine and soft drinks will be served. The event will be a great opportunity to socialise and engage with our many industry sponsors, many of who are actively recruiting.

If weather permits, we will be opening the Queen's Tower Rooms to have access to the Terrace next to the Queen's Lawn where the outdoor BBQ will be served with a fine selection of meat and vegetarian burgers. In case of bad weather, food will be served inside Queen's Tower Rooms.

Please join us for this social event which is fully included in the conference registration.

If you want to find out more about MedIAN and how to become a member, please visit
<http://median.ac.uk/>.

Venue:

Queen's Tower Rooms

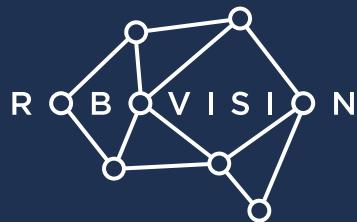
Time:

17:30 - 20:00



OUR
PLATFORM

WHO?



A.I. Computer Vision
& Robotics Experts

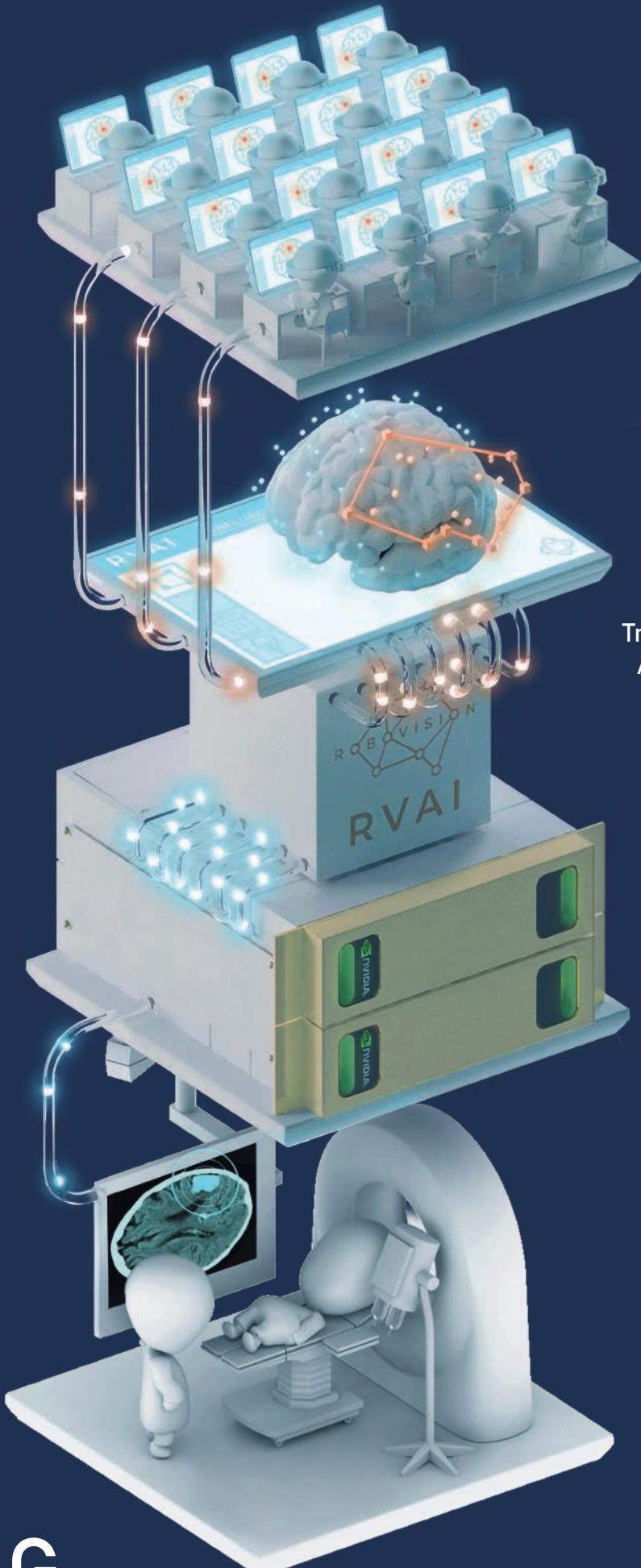
WHAT?

End-to-End A.I. Platform
for Realising your Ideas

WHY?

Label & Train
a Model in 1 Day
Don't Lose Time

START
LABELLING YOUR
CT SCAN DATA
TODAY!



Crowd
Labelling

2D & 3D
Labelling
Tools

Train & Infer
A.I. Models

Hard- &
Software
Stack

REAL
RESULTS

DEEP LEARNING APPLIED

info@robovision.ai
www.robovision.ai



ELITE
PARTNER

TUESDAY

10:00-11:00 – Oral session 3: Adversarial training

- 10:00 **Learning with Multitask Adversaries Using Weakly Labelled Data for Semantic Segmentation in Retinal Images**
Oindrila Saha, Rachana Sathish, Debdoot Sheet
- 10:23 **Image Synthesis with a Convolutional Capsule Generative Adversarial Network**
Cher Bass, Tianhong Dai, Benjamin Billot, Kai Arulkumaran, Antonia Creswell, Claudia Clopath, Vincenzo De Paola, Anil Anthony Bharath
- 10:46 **3-minute spotlights for full paper posters**
- Assessing Knee OA Severity with CNN Attention-based End-to-end Architectures**
Marc Górriz, Joseph Antony, Kevin McGuinness, Xavier Giró-i-Nieto, Noel E. O'Connor
- Cluster Analysis in Latent Space: Identifying Personalized Aortic Valve Prosthesis Shapes Using Deep Representations**
Jannis Hagenah, Kenneth Kühl, Michael Scharfschwerdt, Floris Ernst
- On the Spatial and Temporal Influence for the Reconstruction of Magnetic Resonance Fingerprinting**
Fabian Balsiger, Olivier Scheidegger, Pierre G. Carlier, Benjamin Marty, Mauricio Reyes
- Weakly Supervised Deep Nuclei Segmentation Using Points Annotation in Histopathology Images**
Hui Qu, Pengxiang Wu, Qiaoying Huang, Jingru Yi, Gregory M. Riedlinger, Subhajyoti De, Dimitris N. Metaxas

11:30-13:00 – Oral session 4: Weak and unsupervised learning

- 11:30 **Learning Joint Lesion and Tissue Segmentation from Task-specific Hetero-modal Datasets**
Reuben Dorent, Wenqi Li, Jinendra Ekanayake, Sébastien Ourselin, Tom Vercauteren
- 11:53 **Segmenting Potentially Cancerous Areas in Prostate Biopsies Using Semi-Automatically Annotated Data**
Nikolay Burlutskiy, Nicolas Pinchaud, Feng Gu, Daniel Hägg, Mats Andersson, Lars Björk, Kristian Eurén, Cristina Svensson, Lena Kajland Wilén, Martin Hedlund
- 12:16 **Unsupervised Lesion Detection Via Image Restoration with a Normative Prior**
Suhang You, Kerem C. Tezcan, Xiaoran Chen, Ender Konukoglu
- 12:39 **3-minute spotlights for full paper posters**
- Sparse Structured Prediction for Semantic Edge Detection in Medical Images**
Lasse Hansen, Mattias P. Heinrich
- CARE: Class Attention to Regions of Lesion for Classification on Imbalanced Data**
Jiaxin Zhuang, Jiabin Cai, Ruixuan Wang, Jianguo Zhang, Weishi Zheng
- Joint Learning of Brain Lesion and Anatomy Segmentation from Heterogeneous Datasets**
Nicolas Roulet, Diego Fernandez Slezak, Enzo Ferrante
- Training Deep Networks on Domain Randomized Synthetic X-ray Data for Cardiac Interventions**
Daniel Toth, Serkan Cimen, Pascal Ceccaldi, Tanja Kurzendorfer, Kawal Rhode, Peter Mountney
- Learning from Sparsely Annotated Data for Semantic Segmentation in Histopathology Images**
John-Melle Bokhorst, Hans Pinckaers, Peter van Zwam, Iris Nagtegaal, Jeroen van der Laak, Francesco Ciompi

PROGRAM

14:30-16:00 – Oral session 5: Synthesis

14:30 Dynamic Pacemaker Artifact Removal (DyPAR) from CT Data Using CNNs

Tanja Lossau (née Elss), Hannes Nickisch, Tobias Wissel, Samer Hakmi, Clemens Spink, Michael M. Morlock, Michael Grass

14:53 Adversarial Pseudo Healthy Synthesis Needs Pathology Factorization

Tian Xia, Agisilaos Chartsias, Sotirios A. Tsaftaris

15:16 Stain-Transforming Cycle-Consistent Generative Adversarial Networks for Improved Segmentation of Renal Histopathology

Thomas de Bel, Meyke Hermsen, Jesper Kers, Jeroen van der Laak, Geert Litjens

15:39 3-minute spotlights for full paper posters

Deep Learning Approach to Semantic Segmentation in 3D Point Cloud Intra-oral Scans of Teeth

Farhad Ghazvinian Zanjani, David Anssari Moin, Bas Verheij, Frank Claessen, Teo Cherici, Tao Tan, Peter H. N. de with

Unsupervisedly Training GANs for Segmenting Digital Pathology with Automatically Generated Annotations

Michael Gadermayr, Laxmi Gupta, Barbara M. Klinkhammer, Peter Boor, Dorit Merhof

Iterative Learning to Make the Most of Unlabeled and Quickly Obtained Labeled Data in Histology

Laxmi Gupta, Barbara Mara Klinkhammer, Peter Boor, Dorit Merhof, Michael Gadermayr

Digitally Stained Confocal Microscopy Through Deep Learning

Marc Combalia, Javiera Pérez-Anker,

Adriana García-Herrera, Llúcia Alos, Verónica Vilaplana, Ferran Marqués, Susana Puig, Josep Malvehy

DavinciGAN: Unpaired Surgical Instrument Translation for Data Augmentation

Kyungmoon Lee, Min-Kook Choi, Heechul Jung

16:30-18:00 – Poster session 2

Oral presentation posters

O-T-1 Learning with Multitask Adversaries Using Weakly Labelled Data for Semantic Segmentation in Retinal Images

Oindrila Saha, Rachana Sathish, Debdoot Sheet

O-T-2 Image Synthesis with a Convolutional Capsule Generative Adversarial Network

Cher Bass, Tianhong Dai, Benjamin Billot, Kai Arulkumaran, Antonia Creswell, Claudia Clopath, Vincenzo De Paola, Anil Anthony Bharath

O-T-3 Learning Joint Lesion and Tissue Segmentation from Task-specific Hetero-modal Datasets

Reuben Dorent, Wenqi Li, Jinendra Ekanayake, Sébastien Ourselin, Tom Vercauteren

O-T-4 Segmenting Potentially Cancerous Areas in Prostate Biopsies Using Semi-Automatically Annotated Data

Nikolay Burlutskiy, Nicolas Pinchaud, Feng Gu, Daniel Hägg, Mats Andersson, Lars Björk, Kristian Eurén, Cristina Svensson, Lena Kajland Wilén, Martin Hedlund

O-T-5 Unsupervised Lesion Detection Via Image Restoration with a Normative Prior

Suhang You, Kerem C. Tezcan, Xiaoran Chen, Ender Konukoglu

16:30-18:00 – Poster session 2 (Cont.)**Oral presentation posters (Cont.)****O-T-6 Dynamic Pacemaker Artifact Removal (DyPAR) from CT Data Using CNNs**

Tanja Lossau (née Elss), Hannes Nickisch, Tobias Wissel, Samer Hakmi, Clemens Spink, Michael M. Morlock, Michael Grass

O-T-7 Adversarial Pseudo Healthy Synthesis Needs Pathology Factorization

Tian Xia, Agisilaos Chartsias, Sotirios A. Tsaftaris

O-T-8 Stain-Transforming Cycle-Consistent Generative Adversarial Networks for Improved Segmentation of Renal Histopathology

Thomas de Bel, Meyke Hermens, Jesper Kers, Jeroen van der Laak, Geert Litjens

Full paper posters**F-T-1 Neural Processes Mixed-Effect Models for Deep Normative Modeling of Clinical Neuroimaging Data**

Seyed Mostafa Kia, Andre F. Marquand

F-T-2 Assessing Knee OA Severity with CNN Attention-based End-to-end Architectures

Marc Górriz, Joseph Antony, Kevin McGuinness, Xavier Giró-i-Nieto, Noel E. O'Connor

F-T-3 Cluster Analysis in Latent Space: Identifying Personalized Aortic Valve Prosthesis Shapes Using Deep Representations

Jannis Hagenah, Kenneth Kühl, Michael Scharfschwerdt, Floris Ernst

F-T-4 On the Spatial and Temporal Influence for the Reconstruction of Magnetic Resonance Fingerprinting

Fabian Balsiger, Olivier Scheidegger, Pierre G. Carlier, Benjamin Marty, Mauricio Reyes

F-T-5 Weakly Supervised Deep Nuclei Segmentation Using Points Annotation in Histopathology Images

Hui Qu, Pengxiang Wu, Qiaoying Huang, Jingru Yi, Gregory M. Riedlinger, Subhajyoti De, Dimitris N. Metaxas

F-T-6 Sparse Structured Prediction for Semantic Edge Detection in Medical Images

Lasse Hansen, Matthias P. Heinrich

F-T-7 CARE: Class Attention to Regions of Lesion for Classification on Imbalanced Data

Jiaxin Zhuang, Jiabin Cai, Ruixuan Wang, Jianguo Zhang, Weishi Zheng

F-T-8 Joint Learning of Brain Lesion and Anatomy Segmentation from Heterogeneous Datasets

Nicolas Roulet, Diego Fernandez Slezak, Enzo Ferrante

F-T-9 Training Deep Networks on Domain Randomized Synthetic X-ray Data for Cardiac Interventions

Daniel Toth, Serkan Cimen, Pascal Ceccaldi, Tanja Kurzendorfer, Kawal Rhode, Peter Mountney

F-T-10 Learning from Sparsely Annotated Data for Semantic Segmentation in Histopathology Images

John-Melle Bokhorst, Hans Pinckaers, Peter van Zwam, Iris Nagtegaal, Jeroen van der Laak, Francesco Ciompi

Abstract posters**A-T-1 FRODO: Free Rejection of Out-of-distribution Samples: Application to Chest X-ray Analysis**

Erdi Çallı, Keelin Murphy, Ecem Sogancioglu, Bram van Ginneken

A-T-2 Colorectal Polyp Size Classification Using a Siamese Network

Benjamin Villard, Yuichi Mori, Masashi Misawa, Shin-ei Kudo, Hayato Itoh, Masahiro Oda, Kensaku Mori

PROGRAM

16:30-18:00 – Poster session 2 (Cont.)

Abstract posters (Cont.)

- A-T-3 Deep Convolution Neural Network Model for Automatic Risk Assessment of Patients with Non-metastatic Nasopharyngeal Carcinoma**
Richard Du, Peng Cao, Lujun Han, Qiyong Ai, Ann D. King, Varut Vardhanabutti
- A-T-4 Brain Tumor Segmentation Using Topological Loss in Convolutional Networks**
Charan Reddy, Karthik Gopinath, Herve Lombaert
- A-T-5 Significance of Residual Learning and Boundary Weighted Loss in Ischaemic Stroke Lesion Segmentation**
Ronnie Rajan, Rachana Sathish, Debdoot Sheet
- A-T-6 Stratify or Inject: Two Simple Training Strategies to Improve Brain Tumor Segmentation**
Raphael Meier, Michael Rebsamen, Urs peter Knecht, Mauricio Reyes, Roland Wiest, Richard McKinley
- A-T-7 Efficient Neural Architecture Search on Low-Dimensional Data for OCT Image Segmentation**
Nils Gessert, Alexander Schlaefer
- A-T-8 Guiding 3D U-Nets with Signed Distance Fields for Creating 3D Models from Images**
Kristine Aavild Juhl, Rasmus Reinhold Paulsen, Anders Bjorholm Dahl, Vedrana Andersen Dahl, Ole De Backer, Klaus Fuglsang Kofoed, Oscar Camara
- A-T-9 Biasing Deep ConvNets for Semantic Segmentation of Medical Images with a Prior-driven Prediction Function**
Olivier Petit, Nicolas Thome, Luc Soler
- A-T-10 Chest CT Super-resolution and Domain-adaptation Using Memory-efficient 3D Reversible GANs**
Tycho F.A. van der Ouderaa, Daniel E. Worrall, Bram van Ginneken
- A-T-11 Sparse Annotations with Random Walks for U-Net Segmentation of Biodegradable Bone Implants in Synchrotron Microtomograms**
Niclas Bockelmann, Diana Krüger, D.C. Florian Wieland, Berit Zeller-Plumhoff, Niccoló Peruzzi, Silvia Galli, Regine Willumeit-Römer, Fabian Wilde, Felix Beckmann, Jörg Hammel, Julian Moosmann, Mattias P Heinrich
- A-T-12 Synthetic CT Generation from MRI Using Improved DualGAN**
Denis Prokopenko, Joël Valentin Stadelmann, Heinrich Schulz, Steffen Renisch, Dmitry V Dylov
- A-T-13 Deep Fully Convolutional Network for MR Fingerprinting**
Dongdong Chen, Mohammad Golbabaei, Pedro A Gómez, Marion I Menzel, Mike E Davies
- A-T-14 A Generalized Network for MRI Intensity Normalization**
Attila Simkó, Tommy Löfstedt, Anders Garpebring, Tufve Nyholm, Joakim Jonsson
- A-T-15 Deep Learning Based Partial Annotation Framework for Instance Segmentation in Histopathology Images**
Elad Arbel, Itay Remer, Amir Ben-Dor
- A-T-16 Hepatic Vessel Segmentation Using a Reduced Filter 3D U-Net in Ultrasound Imaging**
Bart R. Thomson, Jasper Nijkamp, Oleksandra Ivashchenko, Ferdinand van der Heijden, Jasper N. Smit, Niels F M Kok, Koert F D Kuhlmann, Theo J.M. Ruers, Matteo Fusaglia
- A-T-17 Robustly Segmenting Quadriceps Muscles of Ultra-Endurance Athletes with Weakly Supervised U-Net**
Hoai-Thu Nguyen, Pierre Croisille, Magalie Viallon, Sarah Leclerc, Sylvain Grange, Rémi Grange, Olivier Bernard, Thomas Grenier
- A-T-18 Coronary Artery Segmentation in Cardiac CT Angiography Using 3D Multi-Channel U-Net**
Yo-Chuan Chen, Yi-Chen Lin, Ching-Ping Wang, Chia-Yen Lee, TzungDau Wang, Wen-Jeng Lee, Chung-Ming Chen

16:30-18:00 – Poster session 2 (Cont.)**Abstract posters (Cont.)****A-T-19 Effect of Adding Probabilistic Zonal Prior in Deep Learning-based Prostate Cancer Detection**

Matin Hosseinzadeh, Patrick Brand, Henkjan Huisman

A-T-20 Regression Activation Mapping on the Cortical Surface Using Graph Convolutional Networks

Ben A Duffy, Mengting Liu, Trevor Flynn, Arthur W Toga, A James Barkovich, Duan Xu, Hosung Kim

A-T-21 Synthesis of CT Images Using CycleGANs: Enhancement of Anatomical Accuracy

Dominik F. Bauer, Alena-Kathrin Schnurr, Tom Russ, Stephan Goerttler, Lothar R. Schad, Frank G Zoellner, Khanlian Chung

A-T-22 Spatio-temporal Regularization for Deep MR Fingerprinting

Mohammad Golbabaei, Dongdong Chen, Mike Davies, Marion I. Menzel, Pedro A. Gomez

A-T-23 Deep Posterior Sampling: Uncertainty Quantification for Large Scale Inverse Problems

Jonas Adler, Ozan Öktem

A-T-24 Vertebra Partitioning With Thin-plate Spline Surfaces Steered by a Convolutional Neural Network

Nick Pawlowski, Ben Glocker

A-T-25 Vertebra Partitioning with Thin-Plate Spline Surfaces Steered by a Convolutional Neural Network

Nikolas Lessmann, Jelmer M. Wolterink, Majd Zreik, Max A. Viergever, Bram van Ginneken, Ivana Išgum

A-T-26 GANs 'N Lungs: Improving Pneumonia Prediction

Tatiana Malygina, Elena Ericheva, Ivan Drokin

A-T-27 Simultaneous Detection and Grading of Prostate Cancer in MultiParametric MRI

Coen de Vente, Pieter Vos, Josien Pluim, Mitko Veta

A-T-28 Screening Mammogram Classification with Prior Exams

Jungkyu Park, Jason Phang, Yiqiu Shen, Nan Wu, S. Gene Kim, Linda Moy, Kyunghyun Cho, Krzysztof J Geras

A-T-29 Optimal Windowing of MR Images Using Deep Learning: An Enabler for Enhanced Visualization

Deepthi Sundaran, Dheeraj Kulkarni, Jignesh Dholakia

A-T-30 Pneumothorax Detection and Localization in Chest Radiographs: A Comparison of Deep Learning Approaches

André Gooßen, Hrishikesh Deshpande, Tim Harder, Evan Schwab, Ivo Baltruschat, Thusitha Mabotuwana, Nathan Cross, Axel Saalbach

A-T-31 Pathological Myopic Image Analysis with Transfer Learning

Ruitao Xie, Libo Liu, Jingxin Liu, Connor S Qiu

A-T-32 Geometric Deep Learning and Heatmap Prediction for Large Deformation Registration of Abdominal and Thoracic CT

In Young Ha, Lasse Hansen, Matthias Wilms, Mattias P. Heinrich

A-T-33 A Strong Baseline for Domain Adaptation and Generalization in Medical Imaging

Li Yao, Jordan Prosky, Ben Covington, Kevin Lyman

A-T-34 GradMask: Reduce Overfitting by Regularizing Saliency

Becks Simpson, Francis Dutil, Yoshua Bengio, Joseph Paul Cohen

A-T-35 Tumor Semantic Segmentation in Hyperspectral Images Using Deep Learning

Stojan Trajanovski, Caifeng Shan, Pim J C Weijtmans, Susan G. Brouwer de Koning, Theo J. M. Ruers

GALA DINNER

The event most attendees look forward to, this year's Gala will be held in the stunning Victoria and Albert museum. Built in 1852 this unique gem of Victorian architecture is home to 2.3 million objects that span over 5000 years of art.

The John Madejski Garden represents the centre of the V&A. It is one of the most elegant outdoor venues in London featuring a paved ellipse with water jets between steps. The perfect location to start this year's London-style summer Gala with a refreshing drink accompanied by a variety of extraordinary food and lively Jazz music. The garden is one of London's hidden treasures and is particularly magical when illuminated at night.

Later in the evening the party will continue inside the remarkable Dome. It is a stunning example of classical architecture with its soaring ceiling and marble floors. Enjoy a drink at the central bar that is overlooked by Dale Chihuly's exceptional glass sculpture or unwind on the dance floor and get the party going.

We are looking forward to welcoming you at the V&A to enjoy a unique night out in this iconic venue.



GALA DINNER

Venue:

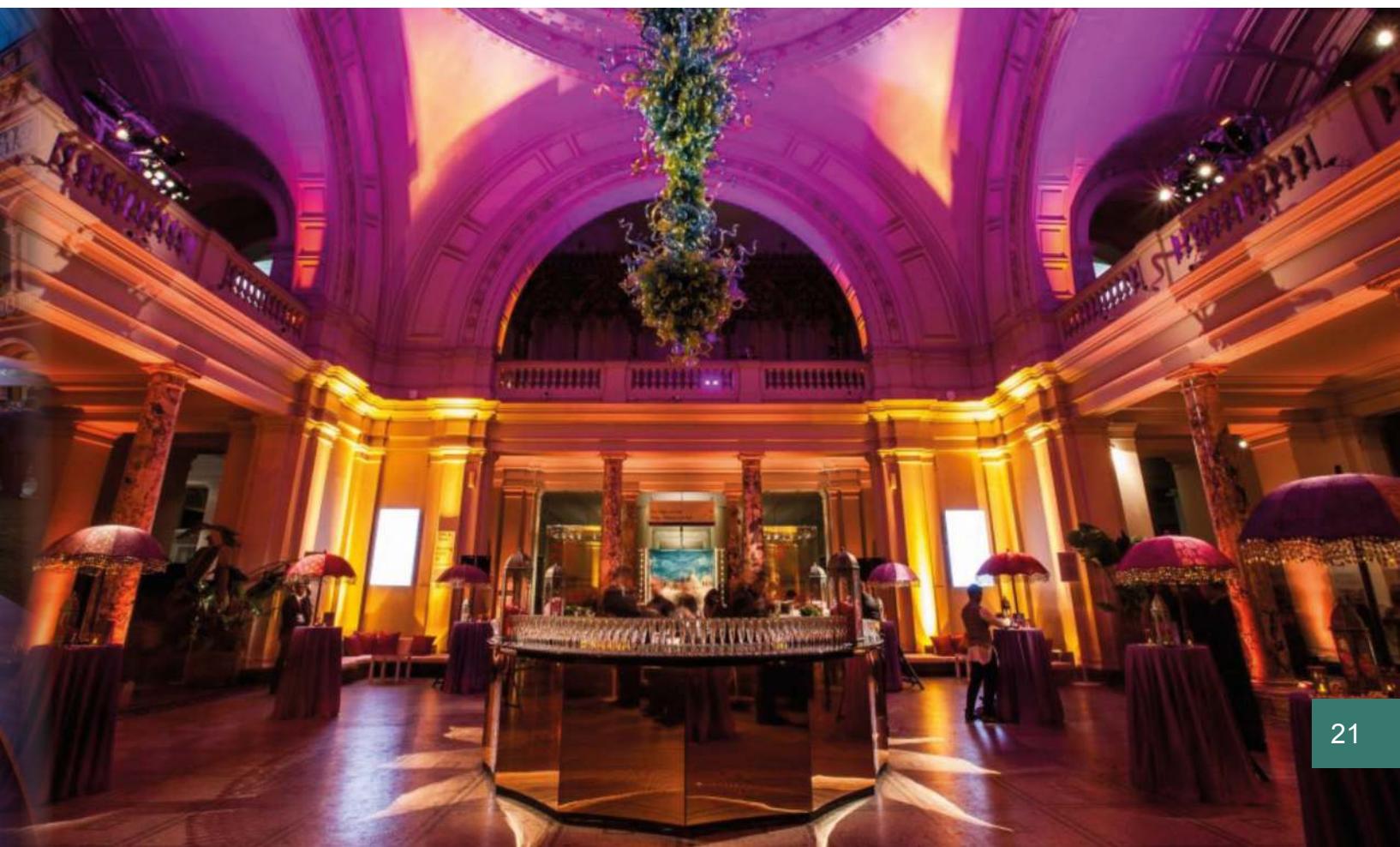
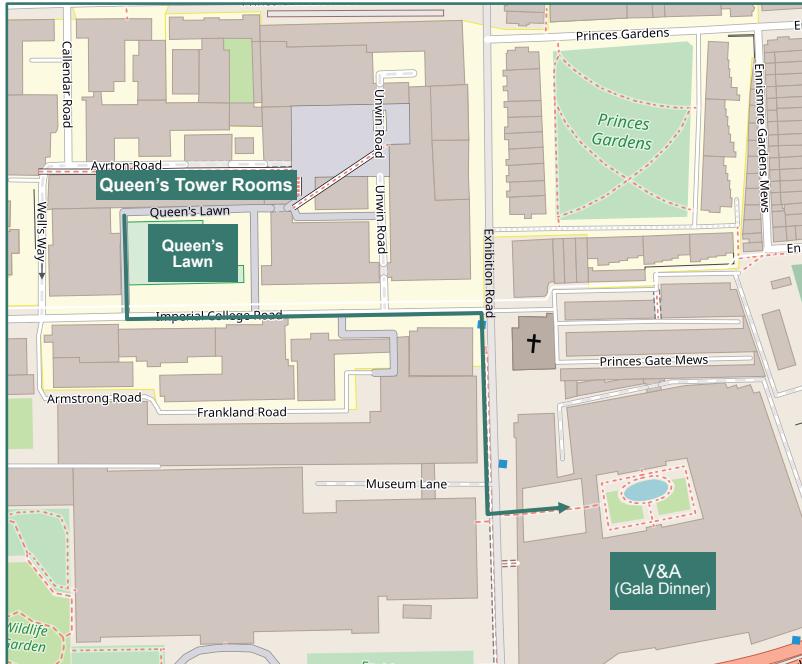
Victoria and Albert Museum
Cromwell Road
London, SW7 2RL

Entrance:

Exhibition Road Entrance

Time:

18:45 - 23:00



PROGRAM

WEDNESDAY

10:00-11:00 – Oral session 6: Reconstruction

- 10:00 **A Hybrid, Dual Domain, Cascade of Convolutional Neural Networks for Magnetic Resonance Image Reconstruction**
Roberto Souza, R. Marc Lebel, Richard Frayne
- 10:23 **Dynamic MRI Reconstruction with Motion-Guided Network**
Qiaoying Huang, Dong Yang, Hui Qu, Jingru Yi, Pengxiang Wu, Dimitris Metaxas
- 10:46 **3-minute spotlights for full paper posters**
- Deep Reinforcement Learning for Subpixel Neural Tracking** Tianhong Dai, Magda Dubois, Kai Arulkumaran, Jonathan Campbell, Cher Bass, Benjamin Billot, Fatmatulzehra Uslu, Vincenzo de Paola, Claudia Clopath, Anil Anthony Bharath
- Prediction of Disease Progression in Multiple Sclerosis Patients Using Deep Learning Analysis of MRI Data**
Adrian Tousignant, Paul Lemaître, Doina Precup, Douglas L. Arnold, Tal Arbel
- Generative Image Translation for Data Augmentation of Bone Lesion Pathology**
Anant Gupta, Srivas Venkatesh, Sumit Chopra, Christian Ledig
- Transfer Learning by Adaptive Merging of Multiple Models**
Robin Geyer, Luca Corinzia, Viktor Wegmayr

14:30-16:00 – Oral session 7: Structured output

- 14:30 **Deep Hierarchical Multi-label Classification of Chest X-ray Images**
Haomin Chen, Shun Miao, Daguang Xu, Gregory D. Hager, Adam P. Harrison
- 14:53 **Dense Segmentation in Selected Dimensions: Application to Retinal Optical Coherence Tomography**
Bart Liefers, Cristina González-Gonzalo, Caroline Klaver, Bram van Ginneken, Clara I. Sánchez
- 15:16 **A Novel Segmentation Framework for Uveal Melanoma in Magnetic Resonance Imaging Based on Class Activation Maps**
Huu-Giao Nguyen, Alessia Pica, Jan Hrbacek, Damien C. Weber, Francesco La Rosa, Ann Schalenbourg, Raphael Sznitman, Meritxell Bach Cuadra

11:30-13:00 – Poster session 3***Oral presentation posters***

- O-W-1 A Hybrid, Dual Domain, Cascade of Convolutional Neural Networks for Magnetic Resonance Image Reconstruction**

Roberto Souza, R. Marc Lebel, Richard Frayne

- O-W-2 Dynamic MRI Reconstruction with Motion-Guided Network**

Qiaoying Huang, Dong Yang, Hui Qu, Jingru Yi, Pengxiang Wu, Dimitris Metaxas

- O-W-3 Deep Hierarchical Multi-label Classification of Chest X-ray Images**

Haomin Chen, Shun Miao, Daguang Xu, Gregory D. Hager, Adam P. Harrison

- O-W-4 Dense Segmentation in Selected Dimensions: Application to Retinal Optical Coherence Tomography**

Bart Liefers, Cristina González-Gonzalo, Caroline Klaver, Bram van Ginneken, Clara I. Sánchez

- O-W-5 A Novel Segmentation Framework for Uveal Melanoma in Magnetic Resonance Imaging Based on Class Activation Maps**

Huu-Giao Nguyen, Alessia Pica, Jan Hrbacek, Damien C. Weber, Francesco La Rosa, Ann Schalenbourg, Raphael Sznitman, Meritxell Bach Cuadra

Full paper posters

- F-W-1 Deep Learning Approach to Semantic Segmentation in 3D Point Cloud Intra-oral Scans of Teeth**

Farhad Ghazvinian Zanjani, David Anssari Moin, Bas Verheij, Frank Claessen, Teo Cherici, Tao Tan, Peter H. N. de with

- F-W-2 Unsupervisedly Training GANs for Segmenting Digital Pathology with Automatically Generated Annotations**

Michael Gadermayr, Laxmi Gupta, Barbara M. Klinkhammer, Peter Boor, Dorit Merhof

- F-W-3 Iterative Learning to Make the Most of Unlabeled and Quickly Obtained Labeled Data in Histology**

Laxmi Gupta, Barbara Mara Klinkhammer, Peter Boor, Dorit Merhof, Michael Gadermayr

- F-W-4 Digitally Stained Confocal Microscopy Through Deep Learning** Marc Combalia, Javiera Pérez-Anker, Adriana García-Herrera, Llúcia Alos, Verónica Vilaplana, Ferran Marqués, Susana Puig, Josep Malvehy

- F-W-5 DavinciGAN: Unpaired Surgical Instrument Translation for Data Augmentation**

Kyungmoon Lee, Min-Kook Choi, Heechul Jung

- F-W-6 Deep Reinforcement Learning for Subpixel Neural Tracking** Tianhong Dai, Magda Dubois, Kai Arulkumaran, Jonathan Campbell, Cher Bass, Benjamin Billot, Fatmatulzehra Uslu, Vincenzo de Paola, Claudia Clopath, Anil Anthony Bharath

- F-W-7 Prediction of Disease Progression in Multiple Sclerosis Patients Using Deep Learning Analysis of MRI Data**

Adrian Tousignant, Paul Lemaître, Doina Precup, Douglas L. Arnold, Tal Arbel

- F-W-8 Generative Image Translation for Data Augmentation of Bone Lesion Pathology**

Anant Gupta, Srivas Venkatesh, Sumit Chopra, Christian Ledig

- F-W-9 Transfer Learning by Adaptive Merging of Multiple Models**

Robin Geyer, Luca Corinzia, Viktor Wegmayr

PROGRAM

Abstract posters

A-W-1 Modeling Clinical Assessor Intervariability Using Deep Hypersphere Auto-encoders

Joost van der Putten, Fons van der Sommen, Jeroen de Groot, Maarten Struyvenberg, Svitlana Zinger, Wouter Curvers, Erik Schoon, Jaques Bergman, Peter H.N. de With

A-W-2 Using Collaged Data Augmentation to Train Deep Neural Net with Few Data

Hsun-An Chiang, Cheng-Shao Chiang, Chi-Sheng Shih

A-W-3 Prostate Cancer Segmentation Using Manifold Mixup U-Net

Wonmo Jung, Sejin Park, Kyu-Hwan Jung, Sung Il Hwang

A-W-4 Extended 2D Consensus Hippocampus Segmentation

Diedre Carmo, Bruna Silva, Clarissa Yasuda, Leticia Rittner, Roberto Lotufo

A-W-5 Uncertainty-Driven Semantic Segmentation Through HumanMachine Collaborative Learning

Mahdyar Ravanbakhsh, Tassilo Klein, Kayhan Batmanghelich, Moin Nabi

A-W-6 A Multi-Task Self-Normalizing 3D-CNN to Infer Tuberculosis Radiological Manifestations

Pedro M. Gordaliza, Juan José Vaquero, Sally Sharpe, Fergus Gleeson, Arrate Muñoz-Barrutia

A-W-7 Relevance Analysis of MRI Sequences for Automatic Liver Tumor Segmentation

Grzegorz Chlebus, Nasreddin Abolmaali, Andrea Schenk, Hans Meine

A-W-8 Efficient Prealignment of CT Scans for Registration Through a Bodypart Regressor

Hans Meine, Alessa Hering

A-W-9 Uncertainty Quantification in Computer-Aided Diagnosis: Make Your Model Say “I Don’t Know“ for Ambiguous Cases

Max-Heinrich Laves, Sontje Ihler, Tobias Ortmaier

A-W-10 Low Dose SPECT Image Denoising Using a Generative Adversarial Network

Qi Zhang, Jingzhang Sun, Greta S. P. Mok

A-W-11 Towards Manifold Learning of Image-Based Motion Models for Oscillating Vocal Folds

Sontje Ihler, Max-Heinrich Laves, Tobias Ortmaier

A-W-12 Multiparametric Deep Learning Tissue Signatures for Muscular Dystrophy: Preliminary Results

Alex E. Bocchieri, Vishwa S. Parekh, Kathryn R. Wagner, Shivani Ahlawat, Vladimir Braverman, Doris G. Leung, Michael A. Jacobs

A-W-13 Template Transformer Networks for Image Segmentation

Matthew Chung Hai Lee, Kersten Petersen, Nick Pawłowski, Ben Glocker, Michiel Schaap

A-W-14 Machine Learning of Multimodal MRI to Predict the Development of Epileptic Seizures After Traumatic Brain Injury

Marianna La Rocca, Rachael Garner, Kay Jann, Hosung Kim, Paul Vespa, Arthur W Toga, Dominique Duncan

A-W-15 BACH: Grand Challenge on Breast Cancer Histology Images

Guilherme Aresta, Teresa Araújo, Aurélio Campilho, Catarina Eloy, António Polónia, Paulo Aguiar

A-W-16 Major Vessel Segmentation on X-ray Coronary Angiography Using Deep Networks with a Novel Penalty Loss Function

Su Yang, Jihoon Kweon, Young-Hak Kim

A-W-17 CNN-Based Segmentation of the Cardiac Chambers and Great Vessels in Non-Contrast-Enhanced Cardiac CT

Steffen Bruns, Jelmer M. Wolterink, Robbert W. van Hamersveld, Tim Leiner, Ivana Išgum

A-W-18 On the Effects of Vendor Balancing in Deep Learning for Mammography

Edwin D. de Jong, Jaap Kroes

Abstract posters (Cont.)**A-W-19 Transfer Learning from Synthetic Data Reduces Need for Labels to Segment Brain Vasculature and Neural Pathways in 3D**

Johannes C. Paetzold, Oliver Schoppe, Rami Al-Maskari, Giles Tetteh, Velizar Efremov, Mihail I. Todorov, Ruiyao Cai, Hongcheng Mai, Zhouyi Rong, Ali Ertuerk, Bjoern H. Menze

A-W-20 Deep Learning for Automatic Tumour Segmentation in PET/CT Images of Patients with Head and Neck Cancers

Yngve Mardal Moe, Aurora Rosvoll Groendahl, Martine Mulstad, Oliver Tomic, Ulf Indahl, Einar Dale, Eirik Malinen, Cecilia Marie Futsaether

A-W-21 4D Spatio-Temporal Deep Learning with 4D FMRI Data for Autism Spectrum Disorder Classification

Marcel Bengs, Nils Gessert, Alexander Schlaefer

A-W-22 Uncertainty Handling in Intra-operative Multispectral Imaging with Invertible Neural Networks

Tim J. Adler, Lynton Ardizzone, Leonardo Ayala, Janek Gröhl, Anant Vemuri, Sebastian J. Wirkert, Beat P. Müller-Stich, Carsten Rother, Ullrich Köthe, Lena Maier-Hein

A-W-23 Deep Learning-based Prediction of Kinetic Parameters from Myocardial Perfusion MRI

Cian M. Scannell, Piet van den Bosch, Amedeo Chiribiri, Jack Lee, Marcel Breeuwer, Mitko Veta

A-W-24 Do Lateral Views Help Automated Chest X-ray Predictions?

Hadrien Bertrand, Mohammad Hashir, Joseph Paul Cohen

A-W-25 Deep Neural Networks for Quality Assurance of Image Registration

Sarah Bannister, Denis Page, Thomas Standen, Alexander Dunne, Jacob Rawling, Callum Jacob Birch-Sykes, Megan Z Wilson, Stacey Holloway, Jamie R. McClelland, Yvonne Peters

A-W-26 Automated Mammogram Analysis with a Deep Learning Pipeline

Azam Hamidinekoo, Erika Denton, Reyer Zwiggelaar

A-W-27 Multiscale Deep Neural Networks for Multiclass Tissue Classification of Histological Whole-Slide Images

Rune Wetteland, Kjersti Engan, Trygve Eftestøl, Vebjørn Kvistad, Emilius A.M. Janssen

A-W-28 Deep Neural Networks Improve Radiologists' Performance in Breast Cancer Screening

Nan Wu, Jason Phang, Jungkyu Park, Yiqiu Shen, Zhe Huang, Masha Zorin, Stanisław Jastrzębski, Thibault Févry, Joe Katsnelson, Eric Kim, Stacey Wolfson, Ujas Parikh, Sushma Gaddam, Leng Leng Young Lin, Joshua D. Weinstein, Krystal Airola, Eralda Mema, Stephanie Chung, Esther Hwang, Nazyia Samreen, Kara Ho, Beatriu Reig, Yiming Gao, Hildegard Toth, Kristine Pysarenko, Alana Lewin, Jiyon Lee, Laura Heacock, S. Gene Kim, Linda Moy, Kyunghyun Cho, Krzysztof J. Geras

A-W-29 Conditional Networks for Screening of Breast Cancer Metastases in Lymph Nodes

Gianluca Gerard, Marco Piastra

A-W-30 Robust Reconstruction of Cardiac T1 Maps Using RNNs

Nicola Martini, Alessio Vatti, Andrea Ripoli, Sara Salaris, Gianmarco Santini, Gabriele Valvano, Maria Filomena Santarelli, Dante Chiappino, Daniele Della Latta

A-W-31 Shadow Detection for Ultrasound Images Using Unlabeled Data and Synthetic Shadows

Suguru Yasutomi, Tatsuya Arakaki, Ryuji Hamamoto

A-W-32 Lung Nodules Detection and Segmentation Using 3D Mask-RCNN

Evi Kopelowitz, Guy Englehard

A-W-33 Conditioning Convolutional Segmentation Architectures with Non-Imaging Data

Grzegorz Jacenków, Agisilaos Chartsias, Brian Mohr, Sotirios A. Tsaftaris

A-W-34 Towards Continuous Learning for Glioma Segmentation with Elastic Weight Consolidation

Karin van Garderen, Sebastian van der Voort, Fatih Incekara, Marion Smits, Stefan Klein

PRACTICALITIES

VENUE LOCATION & TRANSPORT

From London City Airport

Take the DLR to Canning Town, then by Underground (a.k.a. “the tube”), Jubilee line to Green Park and the Piccadilly line to South Kensington (journey time 40 minutes).

From Heathrow airport

Heathrow Express, 15 mins to Paddington mainline station, then the Underground, Circle line to South Kensington.

Or take the Underground, Piccadilly Line to South Kensington station (50 minutes travelling time).

From Gatwick airport

Gatwick Express, 30 mins to Victoria mainline station, then by Underground, District or Circle lines to South Kensington.

Alternatively, take a national rail train to Victoria station (journey time 40 minutes) and then by Underground, Circle or District Line; westbound to South Kensington.

From Stansted airport

Stansted Express, 50 mins to Liverpool Street main line station, and then by Underground, Circle line to South Kensington.

Heathrow, Gatwick and Stansted airports are some distance from London and a taxi is not recommended for the whole journey. However, if you have to travel by taxi, establish the cost before you get in.

On foot

From South Kensington Station, the campus is only a ten minute walk. Either follow the subway signposted to the museums or walk north up Exhibition Road. The College is next to the Science Museum.

By bus

South Kensington Campus is easily accessible by bus. A number of routes pass within easy walking distance of the campus.

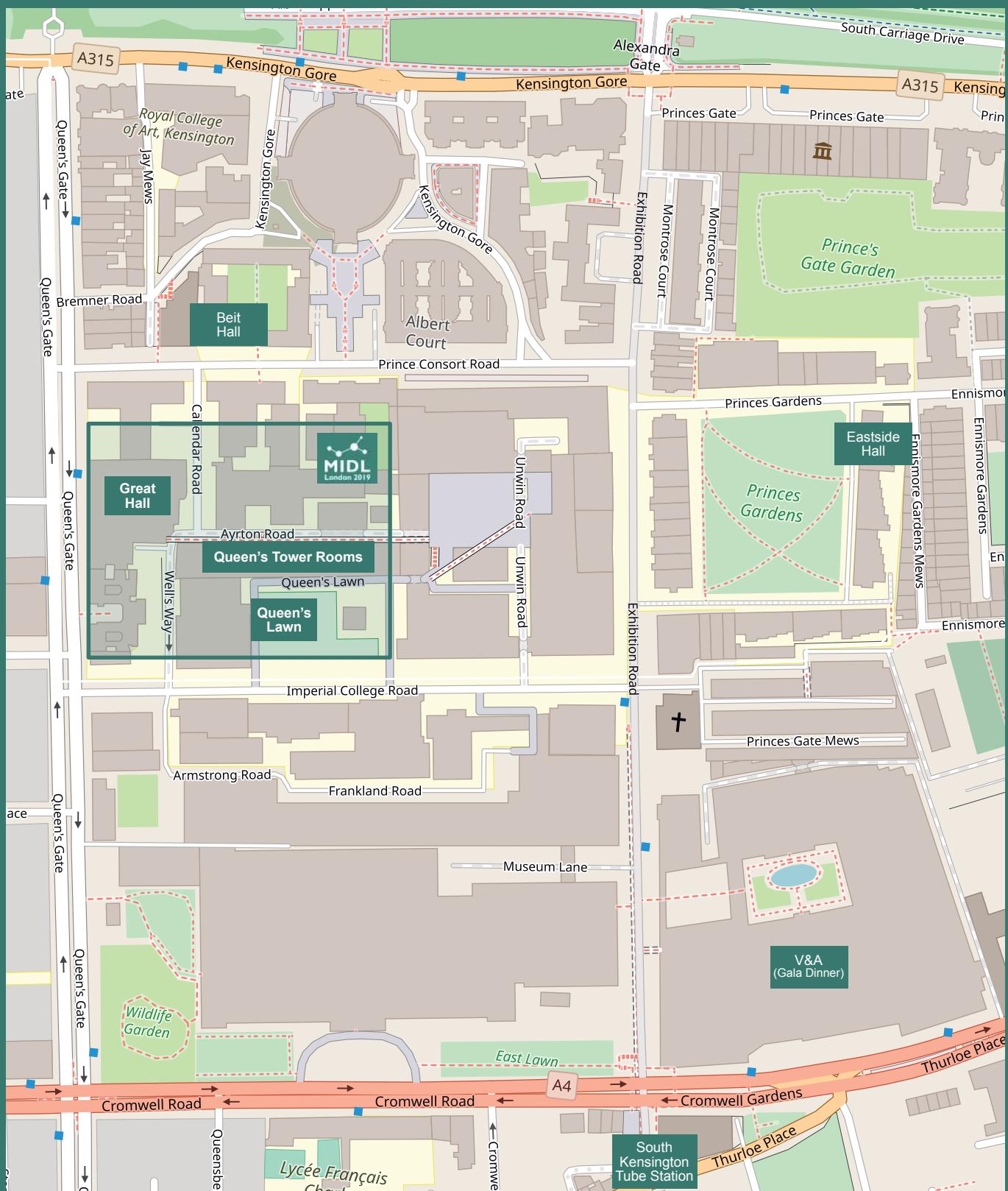
You can check them up on the TFL website: <https://tfl.gov.uk/maps/bus>

By car

Car parking at South Kensington Campus is severely restricted and you are advised NOT to bring a car unless permission has been given. The car park is open to the public from 18.00 to Midnight on weekdays and from 08.00 to Midnight on weekends. Please note that overnight parking is not permitted. Parking in the streets surrounding the College is at pay and display or parking meters for limited periods only.

The postcode to use for satellite navigation to the South Kensington car park is SW7 2BX. The closest entry to the venue is via Imperial College Road, through the Queen’s Lawn.

SITE MAP



PRACTICALITIES



VENUE DETAILS

REGISTRATION

All delegates, speakers and exhibitors must register on first arrival. The Registration Desk will be open in the Sherfield Building from 8:30 am every day. Delegates will be issued with a name badge and lanyard, which must be worn at all times at the conference.

CONFERENCE ROOM @ Great Hall - Level 2, Sheffield Building

Imperial College London's single largest venue, The Great Hall is a flexible, multi-purpose space. Retractable seating provides a variety of flat floor and tiered seating options for conferences with each seat enjoying an uninterrupted line of vision. It has room for 740 attendees in theatre mode, thus providing ample seating space.

POSTER ROOM @ Queen's Tower Rooms - Level 1, Sherfield Building

The posters, coffee breaks, and reception drinks will be at the Queen's Tower Rooms, just downstairs from the great hall. The Queen's Tower Rooms are among the largest events spaces at Imperial, with floor to ceiling windows overlook the Queen's Lawn making it light and airy, and patio doors provide access to outdoor seating.

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 the poster room (Queen's Tower Rooms). If you have any dietary restrictions beyond vegetarian, gluten-free, vegan or halal, please make yourself known to the conference organisers or local college staff such that the appropriate dishes can be provided to you during lunch.

WI-FI

The Cloud

Free WiFi is available throughout the college via Sky WiFi. Connect to 'The Cloud' from the available network list, open a browser and follow the instructions to register.

eduroam

The 'eduroam' network is for eduroam users only. This network is a secure roaming network for use by students, researchers and staff from participating higher education institutions worldwide.

ORGANISATION

ORGANISING COMMITTEE

Conference Chairs

Tom Vercauteren, King's College London

Ben Glocker, Imperial College London

M Jorge Cardoso, King's College London

Program Chairs

Ipek Oguz, Vanderbilt University

Ender Konukoglu, ETH Zurich

Aasa Feragen, University of Copenhagen

Gozde Unal, Istanbul Technical University

Keynote Chair

William M. Wells, Harvard Medical School

Social Chair

Kerstin Klaser, King's College London

ORGANISATION

THANKS

Hassan Patel
Finance Officer

Katherine Bellenie
PA BioMedA

Marzena Esposito
Imperial Venues

Anna Hikkerova
Imperial Accommodation

Sean Conner
Digital Media and Communications Manager

Pam Mandler
OpenReview

Katie Konyn
King's BMEIS Communications Manager

Industry Sponsors

Area Chairs and Reviewers

MIDL 2018 Organisers
Bram van Ginneken
Max Welling
Ivana Išgum
Clarisa Sanchez
Geert Litjens

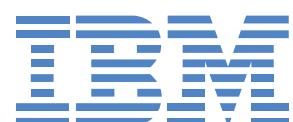
ORGANISATION

SPONSORS

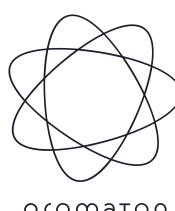
PLATINUM



GOLD



SILVER



ORGANISATION

AREA CHAIRS

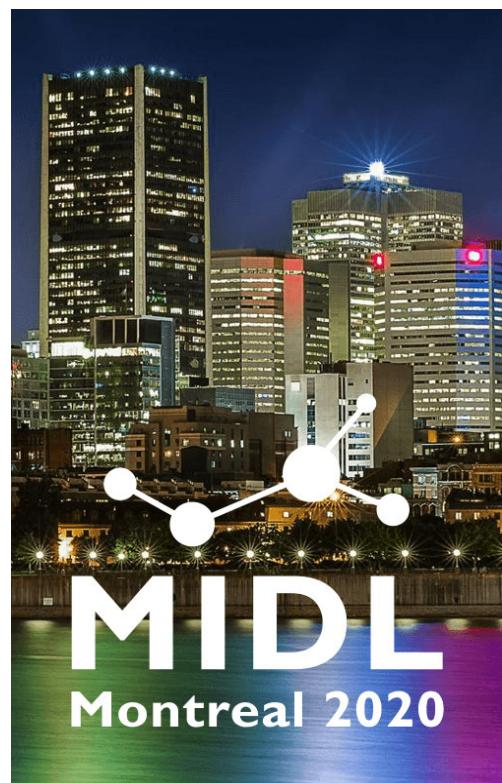
Ehsan Adel	Herve Lombaert
Suyash Awate	Christian Ledig
Arrate Munoz Barrutia	Geert Litjens
Christian Baumgartner	Lena Maier-Hein
Ismail Ben Ayed	Diana Mateus
Hrvoje Bogunovic	Bjoern Menze
Tessa Cook	Brent Munsell
Marleen de Bruijne	Ana Namburete
Qi Dou	Marc Niethammer
Nicha Dvornek	Lauren O'Donnell
Shireen Elhabian	Ozan Oktay
Ilker Hacihaliloglu	Islem Rekik
Matthias Heinrich	Holger Roth
Yi Hong	Clarisa Sanchez
Eugenio Iglesias	Thomas Schulz
Ivana Isgum	Bram van Ginneken
Konstantinos Kamnitsas	Archana Venkataraman
Shella Keilholz	Guorong Wu
Minjeong Kim	Xiahai Zhuang
Sila Kurugol	Lilla Zollei

ORGANISATION

REVIEWERS

Seyed-Ahmad Ahmadi	Aina Frau-Pascual	Mingxia Liu	Matthew Sinclair
Shadi Albarqouni	Adrian Galdran	Le Lu	Ayushi Sinha
Daniel Alexander	Mingchen Gao	Da Ma	Ziga Spiclin
Sharib Ali	Sarah Gerard	Dwarikanath Mahapatra	Jackson Steinkamp
Ryan Amelon	Ali Gholipour	Klaus Maier-Hein	Danail Stoyanov
Michela Antonelli	Stamatia Giannarou	Matteo Mancini	Martin Styner
Shekoofeh Azizi	Polina Golland	Karttikeya Mangalam	Carole Sudre
Ulas Bagci	German Gonzalez	Rashindra Manniesing	Takaaki Sugino
Wenjia Bai	Karthik Gopinath	Dorit Merhof	Heung-II Suk
Sophia Bano	Pedro Gordaliza	Fausto Milletari	Raphael Sznitman
Mathilde Bateson	Ricardo Guerrero	Sara Moccia	Christine Tanner
Kayhan Batmanghelich	Adam Harrison	Pim Moeskops	Ryutaro Tanno
Erik Bekkers	Raein Hashemi	Keelin Murphy	David Tellez
Nesrine Bnouni	Yoonmi Hong	Hannes Nickisch	Martin Urschler
Christopher Bridge	Yipeng Hu	Dong Nie	Thomas van den Heuvel
Esther Bron	henkjan huisman	Julia Noothout	Gijs van Tulder
Aaron Carass	Yuankai Huo	Hirohisa Oda	Harini Veeraraghavan
Daniel Castro	Sang Hyun Park	Ilkay Oksuz	Mitko Veta
Joshua Cates	Hayato Itoh	John Onofrey	Valery Vishnevskiy
Juan Cerrolaza	Colin Jacobs	José Orlando	Chenglong Wang
Shikha Chaganti	Avelino Javer	Firat Ozdemir	Xiaosong Wang
Catie Chang	Shuman Jia	Bartlomiej Papiez	Ross Whitaker
Pierre Chatelain	Yueming Jin	Sarah Parisot	Matthias Wilms
Cheng Chen	Amod Jog	Nick Pawlowski	Jelmer Wolterink
Hao Chen	Samuel Kadoury	Loic Peter	Weidi Xie
Xiaoran Chen	Bernhard Kainz	Caroline Petitjean	Daguang Xu
Francesco	Neerav Karani	Sergey Plis	Qiuping Xu
Ciompi	Hoel Kervadec	Raphael Prevost	Ziyue Xu
Dana Cobzas	Seyed Mostafa Kia	Jonas Richiardi	Dong Yang
Joseph Cohen	Jaeil Kim	Nicola Rieke	Guang Yang
Adrian Dalca	Namkug Kim	Olaf Ronneberger	Xin Yang
Estibaliz Gomez de Mariscal	Gznter Klambauer	Mohammad Sabokrou	Yixuan Yuan
Bob De Vos	Arinbjorn Kolbeinsson	Michiel Schaap	Fan Zhang
Cem Deniz	Panagiotis Korfiatis	Benoit Scherrer	Han Zhang
Adrien Depeursinge	Kivanc Kose	Jo Schlemper	Ling Zhang
Christian Desrosiers	Wouter Kouw	Julia Schnabel	Miaomiao Zhang
Jose Dolz	Sofia Ira Ktena	Andreas Schuh	Can Zhao
Niharika Dsouza	Loic Le Folgoc	Philipp Seeblick	Qingyu Zhao
Zach Eaton-Rosen	Hansang Lee	Anjany Sekuboyina	Guoyan Zheng
Bernhard Egger	Nikolas Lessmann	Raghavendra Selvan	Sihang Zhou
Enzo Ferrante	Wenqi Li	Harshita Sharma	Yanning Zhou
Ahmed Fetit	Xiaoxiao Li	Debdoot Sheet	Juntang Zhuang
		Hoo-Chang Shin	Majd Zreik

See You All
in 2020!





Program at a glance

	Monday	Tuesday	Wednesday
08:30	Registration + Welcome	Coffee + Poster Setup	Coffee + Poster Setup
09:00	Coffee + Poster Setup		
09:30	Opening Remarks	Keynote 2 - M. Bell	Keynote 3 - P. Keane
10:00	Keynote 1 - M. Bronstein	Oral Session 3	Oral Session 6
11:00	Coffee Break	Coffee Break	Coffee Break
11:30	Oral Session 1	Oral Session 4	Poster Session 3
13:00	Lunch	Lunch	Lunch
14:30	Oral Session 2	Oral Session 5	Oral Session 7
16:00	Coffee Break	Break	Coffee Closing
16:30	Poster Session 1	Poster Session 2	
18:00	Drinks Reception		
18:45		Gala Dinner	
20:00			
22:30			

