MIUA 2022
Conference Programme

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Wednesday 27th July 2022

8:00 – 15:00	Registration Desk Opens
9:00 – 9:15	Opening Ceremony
9:15 –10:15	**Oral Session 1: Biomarker Detection** **(Chair: Anna Breger, University of Cambridge)** **9:15 - 9:35** Multimodal cardiomegaly classification with image-derived digital biomarkers. Duvieusart, Benjamin; Krones, Felix H; Parsons, Guy; Tarassenko, Lionel; Papiez, Bartlomiej W; Mahdi, Adam **9:35- 9:55** Proton Density Fat Fraction of Breast Adipose Tissue: Comparison of the Effect of Fat Spectra and Initial Evaluation as a Biomarker. Gordon, Isobel C; Ralli, George P; Fernandes, Carolina; Herlihy, Amy; Brady, Michael **9:55 - 10:15** Revisiting the Shape-Bias of Deep Learning for Dermoscopic Skin Lesion Classification. Lucieri, Adriano; Schmeisser, Fabian; Balada, Christoph Peter; Siddiqui, Shoaib Ahmed; Ahmed, Sheraz; Dengel, Andreas
10:30 – 11:00	Coffee Break & Industrial Booth Exhibition
11:00 – 12:00	**Oral Session 2: Novel Imaging, Image Registration and Reconstruction** **(Chair: Jin Yueming, University College London)** **11:00 - 11:20** Recursive Deformable Image Registration Network with Mutual Attention. Zheng, Jian-Qing; Wang, Ziyang; Huang, Baoru; Vincent, Tonia; Lim, Ngee Han; Papiez, Bartlomiej W **11:20 - 11:40** Faster Diffusion Cardiac MRI with Deep Learning-based breath hold reduction. Tanzer, Michael; Ferreira, Pedro; Scott, Andrew; Khalique, Zohya; Dwornik, Maria; Pennell, Dudley; Yang, Guang; Rueckert, Daniel; Nielles-Vallespin, Sonia **11:40 - 12:00** Simultaneous Semantic and Instance Segmentation for Colon Nuclei Identification and Counting. Liu, Lihao; Hong, Chenyang; Aviles-Rivero, Angelica I; Schönlieb, Carola-Bibiane
12:00 – 12:50	Lunch & Industrial Booth Exhibition
13:00 – 14:00	**Keynote Prof. Polina Golland (MIT)** **Chair: Carola-Bibiane Schönlieb**

14:00 – 15:00 **Poster Session** & ☕ Coffee Break & Industrial Booth Exhibition

—Joint group-wise motion estimation and segmentation of cardiac cine MR images using recurrent U-Net

— Neck Fat Estimation from DXA using Convolutional Neural Networks

— Computational Image Analysis Techniques, Programming Languages and Software Platforms Used in Cancer Research: A Scoping Review

— How effective is adversarial training of CNNs in medical image analysis?

— Leveraging Uncertainty in Deep Learning for Pancreatic Adenocarcinoma Grading

— Thigh and Calf Muscles Segmentation Using Ensemble of Patch-Based Deep Convolutional Neural Network on Whole-Body Water-Fat MRI

— A U-Net Based Progressive GAN for Microscopic Image Augmentation

— A Novel Bi-level Lung Cancer Classification System on CT Scans

— Weakly-Supervised Captioning of Ultrasound Images

— An Uncertainty-Aware Transformer for MRI Cardiac Semantic Segmentation via Mean Teachers

— Jointly Boosting Saliency Prediction and Disease Classification on Chest X-ray Images with Multi-task UNet

— SF-SegFormer: Stepped-Fusion Segmentation Transformer for Brain Tissue Image via Inter-Group Correlation and Enhanced Multi-Layer Perceptron

— Procrustes Analysis of Muscle Fascicle Shapes Based on DTI Fibre Tracking

15:00 – 16:00 **Oral Session 3: Image Interpretation**
(Chair: Yingying Fang, Imperial College London)

15:00 - 15:20 Class Distance Weighted Cross-Entropy Loss for Ulcerative Colitis Severity Estimation. Polat, Gorkem; Ergenc, Ilkay; Kani, Haluk Tarik; Alahdab, Yesim Ozen; Atug, Ozlen; Temizel, Alptekin

15:20 - 15:40 CellCentroidFormer: Combining Self-attention and Convolution for Cell Detection. Wagner, Royden; Rohr, Karl

15:40 - 16:00 Self-Supervision and Multi-Task Learning: Challenges in Fine-Grained COVID-19 Multi-Class Classification from Chest X-rays. Ridzuan, Muhammad; Bawazir, Ameera A; Gollini Navarrete, Ivo; Almakky, Ibrahim; Yaqub, Mohammad

16:00 – 18:00 **WiMIUA Workshop**

Keynote Prof. Fiona Gilbert (University of Cambridge)

Keynote Dr. Yueming Jin (University College London)

Poster Session

Hors d'oeuvre Closing Event WiMIUA Workshop

See Full Programme in [WiMIUA 2022]

Thursday 28th July 2022

8:30 – 15:00 Registration Desk Opens

9:00 – 10:00 **Oral Session 4: Image Segmentation**
(Chair: Rihuan Ke, University of Bristol)

9:00 - 9:20 Ultrasonography Uterus and Fetus Segmentation with Constrained Spatial-Temporal Memory FCN. Kong, Bin; Wang, Xin; Wang, Xin; Yang, Haoyu; Cao, Kunlin; Song, Qi; Yin, Youbing

9:20 - 9:40 Fitting Segmentation Networks on Varying Image Resolutions using Splatting Brudfors, Mikael; Balbastre, Yaël; Ashburner, John; Rees, Geraint; Nachev, Parashkev; Ourselin, Sebastien; Cardoso, Jorge

9:40 - 10:00 A Novel Framework for Coarse-Grained Semantic Segmentation of Whole-Slide Images. Bashir, Saad; Raza, Shan; Shaban, Muhammad; Khurram, Ali; Rajpoot, Nasir

10:00 –10:15 Coffee Break & Industrial Booth Exhibition

10:15 – 11:10 **Oral Session 5: Generative Adversarial Network, Transformer and New Models**
(Chair: Emma Wang, University of Cambridge)

10:15 - 10:35 A Deep Generative Model of Neonatal Cortical Surface Development. Fawaz, Abdulah; Robinson, Emma C; Williams, Logan ZJ; Edwards, A. David

10:35 - 10:55 Polyp2Seg: Improved Polyp Segmentation with Vision Transformer. Mandujano Cornejo, Vittorino; Montoya, Javier

10:55 - 11:15 From astronomy to histology: adapting the FellWalker algorithm to deep nuclear instance segmentation. Yeung, Michael; Watts, Todd; Yang, Guang

11:10 – 12:10 **Keynote Prof. Alejandro Frangi (University of Leeds)**
(Chair: Guang Yang, Imperial College London)

12:10 – 12:25 Flash Podium Talk Microsoft

12:25 – 13:00 Lunch & Industrial Booth Exhibition

13:00 – 14:10 **Abstract Submissions: Poster Session**
(Chair: Mike Roberts, University of Cambridge)

—2D-3D motion registration of rigid objects within a soft tissue structure

—Hyperspectral Imaging Approach for Instrument Detection in Gastrointestinal Tract

—A Trio-Method for Retinal Vessel Segmentation using Image Processing

—Feature analysis and extraction for post aphasia expected recovery prediction

—Understanding Systematically: Rich Media Analysis Using Arithmetic and Chinese as Examples

— Low-dose CT image reconstruction with mixed gauss and poisson noise

— Lung Cancer Detection by Using Optimal Threshold Technique and Image Processing

— 3D Facial Surface Imaging in Dentistry and Beyond
— Aortic Annulus Detection based on Deep Learning for Calcium Analysis of Patients for Transcatheter Aortic Valve Replacement in Dual-energy Cardiac Computed Tomography
— Kernel Smoothing-based Probability Contours for Tumour Segmentation
— Exploiting Semantic Segmentation For Efficient CTA Bone Segmentation
— Model training using Active Learning and Data Augmentation for limited and large histological datasets
— Automated pipeline for deep learning segmentation of multiple organs and extraction of radiomics features
— Quality measures of CTV delineation for irradiation planning of head and neck cancers for conformity with expert guidelines
— Interpretability of Machine Learning in Mammography Image Quality Assessment
— VertXNet: Automatic Segmentation and Identification of Lumbar and Cervical Vertebrae from Spinal X-ray Images
— Improving scalability of semi-automated medical segmentations using uncertainty estimations
— Using Smartphones in Image-Based Medical Diagnosis
— Unet-Based Segmentation for Individual Bones in radiation therapy planning CT scans for Head & Neck region
— Early diagnosis of Alzheimer's Disease using Deep Feature Extraction of Clinical and Neuroimaging Data
— ICOS Protein Expression Segmentation: Can Transformer Networks Give Better Results?
— Combining Attention Mechanisms for Polyps Segmentation in Endoscopy Images
— Irregularity Recognition of Tumor Border in Ultrasound Thyroid Scans Without Segmentation
— Scratch Assay Image Analysis Automation
— Impact of Convolutional Layer Filters' Instability on Robustness of Classification Decisions for Tumour Diagnosis from Ultrasound Images
— Breast Calcification Segmentation and Quantification in Mammography using Double UNET and DBSCAN
— CNN-augmented Multichannel Chan-Vese Segmentation
— Diagnosis of Autism Based on Functional Brain Connectivity using DeepGCN Approach
— Neural Network-Based Left Ventricle Geometry Prediction from CMR Images
— Automated Quality Control of Chest X-Rays
— Cortical Grey Matter Diffusion Alterations Found in Bipolar Disorder and Major Depressive Disorder within the UK Biobank Imaging Study
— Modelling Patient Specific Inter-Fractional Anatomical Changes During Radiotherapy Treatment
— Empirical Study of Quality Image Assessment for Synthesis of Fetal Head Ultrasound Imaging with DCGANs
— Domain Generalization in Colorectal Image Classification using Self-supervised Contrastive Learning

14:10 – 15:10 **Oral Session 6: Image Classification**
(Chair: Mohammad Yaqub, Mohamed bin Zayed University of Artificial Intelligence)

14:10 - 14:30 Deep Bayesian Active-learning-to-rank for Endoscopic Image Data. Kadota, Takeaki; Hayashi, Hideaki; Bise, Ryoma ; Tanaka, Kiyohito; Uchida, Seiichi
14:30 - 14:50 Improving Image Representations via MoCo Pre-Training for Multimodal CXR Classification. Dalla Serra, Francesco; Jacenków, Grzegorz; Dalton, Jeffrey; Deligianni, Fani; O'Neil, Alison Q
14:50 - 15:10 Multi-scale Graph Neural Networks for Mammography Classification and Abnormality Detection. Pelluet, Guillaume; Rizkallah, Mira; Tardy, Mickael; Acosta, Oscar; Mateus, Diana

15:20 – 16:30 **Poster Session** & ☕ Coffee Break & Industrial Booth Exhibition

—Rotation-Equivariant Semantic Instance Segmentation on Biomedical Images

—Spatiotemporal attention constrained deep learning framework for dual-tracer PET imaging

—Joint Learning with Local and Global Consistency for Improved Medical Image Segmentation

—Computerised Methods for Monitoring Diabetic Foot Ulcers on Plantar Foot: A feasibility study

—LKAU-Net: 3D Large-kernel Attention-based U-Net for Automatic MRI Brain Tumor Segmentation

—Attention-fused CNN model compression with knowledge distillation for brain tumor segmentation

—Lung Segmentation Using ResUnet++ Powered by Variational Auto Encoder-Based Enhancement in Chest X-ray Images

—GPU-Net: Lightweight U-Net with More Diverse Features

—TransSLC: Skin Lesion Classification in Dermatoscopic Images with Transformer

—A Neural Architecture Search based Framework for Segmentation of Epithelium, Nuclei and Oral Epithelial Dysplasia Grading

—Contrastive Pretraining for Echocardiography Segmentation with Limited Data

—Point2Mask: A Weakly Supervised Approach for Cell Segmentation using Point Annotation

—High-quality 4D-CBCT imaging from single routine scan

16:30 – 17:30 **Microsoft Research Workshop: "Microsoft Computational Pathology Workshop"**

19:00 **Gala Dinner (Trinity Hall) Location**

Friday 29th July 2022

8:30 – 15:00 Registration Desk Opens

9:00 – 10:00 **Oral Session 7: Image Enhancement, Quality Assessment, and Data Privacy**
(Chair: Soeren Dittmer, University of Cambridge/ University of Bremen)
9:00 - 9:20 Privacy Preserving and Communication Efficient Information Enhancement for Imbalanced Medical Image Classification Li, Xiaochuan; Ke, Yuan
9:20 - 9:40 Non-iterative Blind Deblurring of Digital Microscope Images with Spatially Varying Blur Kaynar, Hasan Furkan; Geissler, Peter; Demaret, Laurent; Seybold, Tamaray; Stechele, Walter
9:40 - 10:00 Low-effort re-identification techniques based on medical imagery threaten patient privacy. Martínez Esmeral, Laura Carolina; Uhl, Andreas

10:00 –10:15 Coffee Break & Industrial Booth Exhibition

10:15 – 11:05 **Oral Session 8: Radiomics, Predictive Models, and Quantitative Imaging**
(Chair: Bartlomiej Papiez University of Oxford)
10:15 - 10:35 Correlation between IBSI morphological features and manually-annotated shape attributes on lung lesions at CT. Isabella; Scialpi, Michele; Aristei, Cynthia; Palumbo, Barbara
10:35 - 10:55 Large-scale Patch-wise Pathological Image Feature Dataset with a Hardware-agnostic Feature Extraction Tool. Huo, Yuankai; Zhu, Zheyu; Liu, Quan; Deng, Ruining; Asad, Zuhayr; Cui, Can; Yao, Tianyuan
10:55 - 11:15 Predicting Myocardial Infarction using Retinal OCT Imaging. Maldonado Garcia, Cynthia L; Ravikumar, Nishant; Frangi, Alejandro F

11:05 – 11:15 Break

11:15 – 12:15 **Keynote Prof. Sotirios Tsaftaris (University of Edinburgh)**
(Chair: Angelica Aviles-Rivero, University of Cambridge)

12:15 – 13:00 Lunch & Industrial Booth Exhibition

13:00 – 14:30 **Industrial Panel (MathWorks, Microsoft, Nvidia, Aiforia)**
(Moderator: Prof. Sir John Aston, University of Cambridge)

14:30 – 15:30 **Poster Session** & Coffee Break & Industrial Booth Exhibition
—STAMP: A Self-training Student-Teacher Augmentation-driven Meta Pseudo-labeling Framework for 3D Cardiac MRI Image Segmentation
—A generative framework for predicting myocardial strain from cine-cardiac magnetic resonance imaging
—Multi-Resolution Fine-Tuning of Vision Transformers
—On the feasibility of radiomic analysis for the detection of breast lesions in speed-of-sound images of the breast

—Implicit U-Net for volumetric medical image segmentation

—A deep-learning lesion segmentation model that addresses class imbalance and expected low probability tissue abnormalities in pre and postoperative liver MRI

—Preoperative CT and intraoperative CBCT image registration and evaluation in robotic cochlear implant surgery

—Utility of Equivariant Message Passing in Cortical Mesh Segmentation

—Removing specular reflection in multispectral dermatological images using blind source separation

—Efficient Pipeline for Rapid Detection Of Catheters And Tubes In Chest Radiographs

—Oral Dental Diagnosis using Deep Learning Techniques: A Review

—A Multi-Scale Self-supervision method for improving cell nuclei segmentation in pathological tissues

15:30 – 16:30 **Oral Session 9: Image-Guided Intervention (Chair: Carlos Reyes Aldasoro, City University of London)**

15:30 - 15:50 A user interface for automatic polyp detection based on deep learning with extended vision. Krenzer, Adrian

15:50 - 16:10 Using deep learning on X-ray orthogonal coronary angiograms for Quantitative. Coronary Analysis. Busto, Laura; González-Nóvoa, José A.; Juan-Salvadores, Pablo; Jiménez, Víctor; Íñiguez, Andrés; Veiga, Cesar

16:10 - 16:30 FCN-Transformer Feature Fusion for Polyp Segmentation. Sanderson, Edward; Matuszewski, Bogdan J

16:30 – 17:00 **Closing Ceremony and Awards**