Conference Programme

4-6 September | Swansea UK

International Conference on AI in Healthcare

Inaugural Edition

4-6 September 2024, Swansea UK

Welcome

On behalf of the organising committee, we welcome all delegates from 20 different countries to attend this inaugural edition of the International Conference on Artificial Intelligence in Healthcare (AIiH 2024), which is hosted in September 2024 in the beautiful city of Swansea.

AIiH aims to provide a prominent platform for researchers and practitioners who are devoted to improving healthcare using modern artificial intelligence. We recognise that healthcare applications present complex and sometimes unique challenges across a wide spectrum, from ethics to technical developments, that generic AI methods are often inadequate. By creating this dedicated forum, we encourage discussions and disseminations of efficient and effective AI solutions and technologies for healthcare, and in turn we hope to influence the research, technology adoption, and decision making in healthcare.

The papers submitted to AIiH 2024 were thoroughly reviewed by up to four referees per paper and 47 papers are selected as full papers for the conference proceedings from 79 submissions. A total of 25 papers are accepted for oral presentation at the conference, in addition to the 36 poster presentations. Contributing authors are from 17 countries, which reflects the international nature of the conference. The best paper prize will be selected and awarded at the conference. AIiH 2024 is also offering 5 full bursaries to students in order to encourage participation, particularly where financial support is needed.

We are honoured to have 9 distinguished scholars as invited speakers. Dr. Amir Atapour-Abarghouei from University of Durham delivers the conference tutorial on Deep Generative Neural Networks. The 5 keynotes are given by Prof. Hao Ni from University College London, Dr. Timothy Rittman from Cambridge University, Dr. Konstantinos Kamnitsas from Oxford University, Prof. Jacques Fleuriot from Edin-burgh University, and Prof. Eiichiro Tanaka from Waseda University. AIiH 2024 also features a 3-speaker Panel Session

on Translating AI Research into Practice by Dr. Alba Di Pardo from IRCCS Istituto Neurologico Mediterraneo Neuromed, Dr. Noura Al Moubayed from Durham University & Evergreen Life, and Dr. Mark Penney from AstraZeneca.

We would like to thank all reviewers for their diligent work and prompt responses. We are indebted to a number of people who have contributed generously to the organisation of the conference: Daniele Cafolla, Jiaxiang Zhang, Raoul Van Loon, Jiaxiang Zhang, Lu Zhang, Jingjing Deng, Hanchi Ren, Beiyu Lin, Rex Ying, and many student volunteers. The conference has received generous support from several companies and institutions. We would like to thank Springer in extending their support to publish the proceedings in LNCS.

Finally, we hope you all find the first edition of this new conference series intellectually stimulating and enjoyable.

Xianghua Xie
Iain Styles
Gibin Powathil
Marco Ceccarelli

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Iain Styles	Queen's University Belfast

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Marco Ceccarelli	University of Rome Tor Vergata

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Xianghua Xie	Swansea University
Rex Ying	Yale University
Jiaxiang Zhang	Swansea University
Lu Zhang	Swansea University
Yilun Zhang	University of Kent
Feng Zhao	USTC of China
Huiyu Zhou	Leciester University
Zhao Zhou	Aalborg University

Programme: Wednesday 4th September

08:30 Registration (until 17.45)

09:15-09:30 Welcome

Tutorial (part 1)

09:30-10:30 Deep Generative Neural Networks
Amir Atapour-Abarghouei, University of Durham

10:30-11:00 Break (tea & coffee)

Tutorial (part 2)

11:00-12:00 Deep Generative Neural Networks
Amir Atapour-Abarghouei, University of Durham

12:00-13:00 Lunch

Keynote

chair: Xianghua Xie, Swansea University

13:00-14:00 **Artificial Intelligence for multiple long-term conditions: clustering and beyond**
Jacques Fleuriot, Edinburgh University

Best paper candidate session

chair: Iain Styles, Queen's University Belfast

14:00-14:15 Assessing the significance of longitudinal data in Alzheimer's Disease forecasting
Batuhan K Karaman (Cornell); Mert Sabuncu (Cornell)

14:15-14:30	Action Recognition for Privacy-preserving Ambient Assisted Living *Vincent Gbouna Zakka (Aston University); Zhuangzhuang Dai (Aston University); Luis J. Manso (Aston University)*
14:30-14:45	GraphDDI: Graph Neural Network for Prediction of Drug-Drug Interaction *Suyash Gupta (IIIT Hyderabad); Siddhartha Laghuvarapu (IIIT Hyderabad); Deva Priyakumar (IIIT Hyderabad)*
14:45-15:00	Transferable Variational Feedback Network for Vendor Generalization in Accelerated MRI *Riti Paul (Arizona State University); Pak Lun Kevin Ding (Arizona State University); Sahil Vora (Arizona State University); Ameet C Patel (Mayo Clinica Arizona); Leland S Hu (Mayo Clinic); Baoxin Li (Arizona State University); Yuxiang Zhou (Mayo Clinc at Arizona)*
15:00-15:15	CVD_Net: Head and Neck Tumor Segmentation and Generalization in PET/CT Scans Across Data from Multiple Medical Centers *Ndipenoch Nchongmaje (Brunel University London)*
15:15-15:45	Break (tea & coffee)

Keynote

chair: Jiaxiang Zhang, Swansea University

15:45-16:45 **AI as the future of memory clinics: hype or happening?**
Timothy Rittman, Cambridge University

Digital twinning, virtual pathology and oncology

chair: Gibin Powathil, Swansea University

16:45-17:00 Weight Perturbations for Simulating Virtual Lesions in a Convolutional Neural Network
Joseph MacInnes (Swansea University); Natalia Zhozhikashvili (HSE University); Matteo Feurra (HSE University)

17:00-17:15 Using GANs to visualise class-specific features in Digital Histopathology images
Catherine Little, Richard Gault, Stephanie Craig, Jacqueline James (Queen's University, Belfast)

17:30-19:00 Reception (CoFo Crucible)

The Crucible is located on the first floor of the Computational Foundry building where the conference is taking place. Computational Foundry is a £32.5 million world-class facility and a beacon for research collaborations backed by £17m from the European Regional Development Fund.

Programme: Thursday 5th September

08:30 Registration (until 17.45)

09:00-09:15 Arrival (tea & coffee)

Keynote

chair: Xianghua Xie, Swansea University

09:15-10:15 **Frameworks for reliable deployment of AI in medical imaging**
Konstantinos Kamnitsas, Oxford University

Patient data, privacy and ethics

chair: Jingjing Deng, University of Durham

10:15-10:30 Enhancing Performance for Highly Imbalanced Medical Data via Data Regularization in a Federated Learning Setting
Georgios Tsoumplekas (Metamind Innovations P.C.); Ilias Siniosoglou (University of Western Macedonia); Vasileios Argyriou (Kingston University London); Ioannis Moscholios (University of Peloponnese); Panagiotis Sarigiannidis (University of Western Macedonia)

10:30-10:45 Intelligent Multi-Document Summarisation for Extracting Insights on Racial Inequalities from Maternity Incident Investigation Reports
Georgina Cosma (Loughborough University); Mohit Kumar Singh (Loughborough University); Patrick Waterson (Loughborough University); Gyuchan Thomas Jun (Loughborough University); Jonathan Back (Health Services Safety Investigations Body (HSSIB))

10:45-11:15 Break (tea & coffee)
Poster Session One presenters to set up posters

Personalised Healthcare and Medicine

chair: Gibin Powathil, Swansea University

11:15-11:30 Augmenting Infrequent Relationships in Clinical Language Models with Graph-Encoded Hierarchical Ontologies
Suraj N Ramchand, Xianghua Xie (Swansea University)

11:30-11:45 Identifying Clusters on Multiple Long-Term Conditions For Adults with Learning Disabilities
Emeka Abakasanga (Loughborough University); Rania Kousovista (Loughborough University); Georgina Cosma (Loughborough University); Gyuchan Jun (Loughborough University); Reza Kiani (Leicestershire Partnership NHS Trust); Satheesh Gangadharan (Leicestershire Partnership NHS Trust)

11:45-12:00 Interpreting Pretrained Speech Models for Automatic Speech Assessment of Voice Disorders
Hok-Shing Lau (University of Wales Trinity Saint David); Mark Huntly (University of Wales Trinity Saint David); Nathan Morgan (University of Wales Trinity Saint David); Adesua Iyenoma (University of Wales Trinity Saint David); Biao Zeng (University of South Wales); Tim Bashford (University of Wales Trinity Saint David)

12:00-13:30 Lunch & Poster Session One

P01 Responsible and Ethical AI for Mental Health Contexts: A Focus on Conservative Communities and Annie the Chatbot
Wendy A Booth (University of South Wales); Dr Mabrouka Abuhmida (University of South Wales)

P02 Unveiling Disparities in Maternity Care: A Topic Modelling Approach to Analysing Maternity Incident Investigation Reports

Georgina Cosma (Loughborough University); Mohit Kumar Singh (Loughborough University); Patrick Waterson (Loughborough University); Gyuchan Thomas Jun (Loughborough University); Jonathan Back (Health Services Safety Investigations)

P03 Cluster and Trajectory Analysis of Multiple Long Term Conditions in Adults with Learning Disabilities
Emeka Abakasanga (Loughborough University); Rania Kousovista (Loughborough University); Georgina Cosma (Loughborough University); Gyuchan Jun (Loughborough University); Reza Kiani (Leicestershire Partnership NHS Trust); Satheesh Gangadharan (Leicestershire Partnership NHS Trust)

P04 A Deep Learning Framework for Assessing the Risk of Transvenous Lead Extraction Procedures
Fazli Wahid (University of East Anglia); YingLiang Ma (University of East Anglia); Vishal Mehta (School of Imaging Sciences and Biomedical Engineering , King's College London); Sandra N Howell (KCL); Steven Niederer (King's College London); C Aldo Rinaldi (School of Imaging Sciences and Biomedical Engineering , King's College London)

P05 Assessing the Impact of Deep Learning Backbones for Mass Detection in Breast Imaging
Edouard Chatzopoulos (UCLouvain); Sébastien Jodogne (UCLouvain)

P06 Enhancing One-Shot CT Image Segmentation with SAM and CLIP Prompt Learning
Choo Sin Wai (Northwestern Polytechnical University); Zhibin Liao (University of Adelaide); Bo Li (Northwestern Polytechnical University); Lin Yuanbo Wu (Swansea University)

P07 Texture Feature Analysis for Classification of Early-Stage Prostate Cancer in mpMRI

Asmail Muftah (Azzaytuna University; Cardiff University); Sophie Shermer (Swansea University); Frank C Langbein (Cardiff University)

P08 Effect of Face Obfuscation Methods on Pose-Based Action Recognition
Muhammad Ahmed Raza (University of Edinburgh); Chris Lochhead (University of Edinburgh); Robert B Fisher (University of Edinburgh)

P09 Artificial Intelligence for Predicting Responses to Thyroid Cancer Treatment
Alaa Abd-alrazaq (Weill Cornell Medicine-Qatar); Rawan AlSaad (Weill Cornell Medicine-Qatar); Arfan Ahmed (Weill Cornell Medicine-Qatar); Hania Aslam (Weill Cornell Medicine-Qatar); Babul Salam (Gulf University for Science & Technology); Sarah Aziz (Weill Cornell Medicine, Qatar); Javaid Sheikh (Weill Cornell Medicine, Qatar)

P10 Generative AI-powered Chronic Kidney Disease Exam Candidates' Practice Test with Self-Grading
Intissar HADDIYA (Faculty of medicine and pharmacy University Mohammed Premier); Andrea Pitrone (Loop AI Group)

P11 Patient Data and Privacy in the Realm of Extended Reality: A Digital Health Perspective
Rahul Sheshan Clare (Manipal Academy of Higher Education); Vani Lakshmi R (Manipal Academy of Higher Education); Sucheta Kolekar (Manipal Institute of Technology, Manipal Academy of Higher Education,); Asha Kamath (Manipal Academy of Higher Education)

P12 ZMAM: A ZKP-Based Mutual Authentication Scheme for the IoMT
Chaoyue Lv (Xidian University); Di Lu (Xidian University); Yuanyuan Zhang (Honghui Hospital, Xi'an Jiaotong University); Xindi Ma (Xidian University); Yulong Shen (Xidian University); Liping Wang (Honghui Hospital, Xi'an Jiaotong University); Jianfeng Ma (Xidian University)

P13 Demystifying the Ethical Framework for Generative AI in Healthcare: A Data Science Perspective
Vani Lakshmi R (Manipal Academy of Higher Education); Rahul Sheshan Clare (Manipal Academy of Higher Education); Asha Kamath (Manipal Academy of Higher Education)

P14 Explainable Machine Learning: Predicting Clinical Outcomes in Welsh Emergency Departments
Megan L Morgan (Swansea University); Alma Rahat; Gareth Jenkins (NHS - Hywel Dda University Health Board); Jiaxiang Zhang (Swansea University)

P15 Synthetic Patient Perspective Data for the Curation and Evaluation of Rare Disease Patient-Facing Technology
Emily E Nielsen (Swansea University); Tom Owen (Swansea University); Matt Roach (Swansea University); Alan Dix (Swansea University and Cardiff Metropolitan University)

P16 Applying Deep Learning based Super-Resolution to Knee Imaging
Álvaro Rey-Blanes (University of Malaga); Enrique Dominguez (University of Malaga)

P17 Utilizing AI and Attention to Assist in Training Medical Students to Read and Diagnose Electrocardiograms
Hartley P. J. (Swansea University), Edwards J. (Swansea University), and MacInnes W. J. (Swansea University)

P18 Predicting Hospital Readmission after Cancer Surgery with Survival Analysis and Machine Learning
*Juliette Murris (HeKA, Inria), Sandrine Katsahian (CIC-1418 EC, HEGP, AP-HP, Paris),*and Audrey Lavenu (IRMAR, Université de Rennes)

13:30-15:30 Plenary Panel Session: Translating AI Research into Practice

chair: Iain Styles, Queen's University Belfast

13:30-14:00 **Artificial Intelligence and Rare Diseases: Addressing Clinical Needs**
Alba Di Pardo, IRCCS Istituto Neurologico Mediterraneo Neuromed, Italy

14:00-14:30 **The challenge of translating ML research into practice in healthcare**
Noura Al Moubayed, Durham University & Evergreen Life

14:30-15:00 **AI and model generation in the pharmaceutical industry**
Mark Penney, AstraZeneca

15:00-15:30 Panel Discussion
Chair: Iain Styles, Queen's University Belfast

15:30-16:00 Break (tea & coffee)

AI in mental health

chair: Lu Zhang, Swansea University

16:00-16:15 Evaluating the Feasibility and Acceptability of a GPT-based Chatbot for Depression Screening: A Mixed-Methods Study
Zhijun Guo (UCL); Alvina Lai (UCL); Zhouyiyi Deng (UCL); Kezhi Li (UCL)

16:15-16:30 Structural Brain Network Generation via Brain Denoising Diffusion Probabilistic Model
Hongjie Jiang (Southern University of Science and Technology); Xuhang Chen (University of Macau); Shuqiang Wang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)

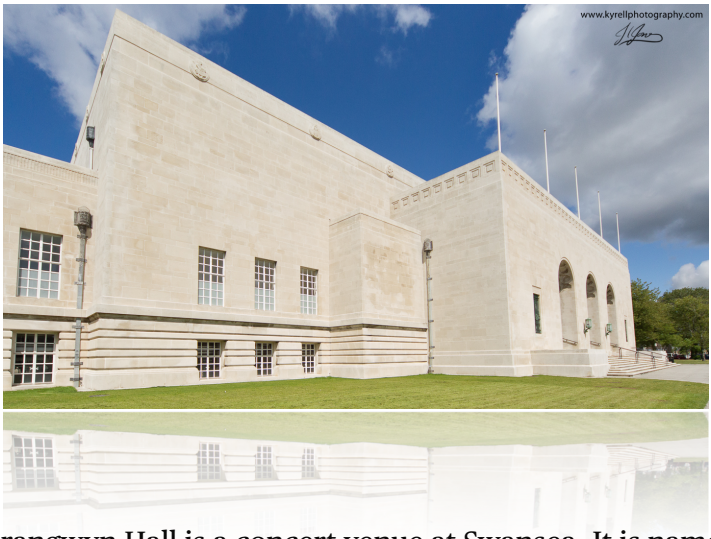
16:30-16:45 Conversation Analysis of Remote Dialogue System for Mental Health Interventions
Shengzhou Yi (The University of Tokyo); Toshiaki Kikuchi (Keio University); Toshihiko Yamasaki (The University of Tokyo)

Assisted living technology

chair: Lu Zhang, Swansea University

16:45-17:00 Innovations in Mosquito Identification: Integrating Deep Learning with Citizen Science
Mulaedza Mathoho (University of Johannesburg); Dustin T van der Haar (University of Johannesburg); Hima Vadapalli (University of Witwatersrand, University of Johannesburg)

19:00-22:00 Conference Dinner (George Hall, Brangwyn)



The Brangwyn Hall is a concert venue at Swansea. It is named after the artist Frank Brangwyn, whose famous panels, originally intended for the House of Lords, are displayed there.

Programme: Friday 6th September

08:30 Registration (until 12.00)

09:00-09:15 Arrival (tea & coffee)

Keynote

chair: Raoul van Loon, Swansea University

09:15-10:15 **Signature-based ML models help sepsis prediction despite the subtle effects of label extraction**
Hao Ni, University College London

Special Session Invited Talk

chair: Daniele Cafolla, Swansea University

10:15-10:45 Continuum Robots in Surgery
Matteo Russo (University of Rome Tor Vergata)

10:45-11:15 Break (tea & coffee)
Poster Session Two presenters to set up posters

Special Session: AI driven robotics for healthcare

chair: Daniele Cafolla, Swansea University

11:15-11:30 Design and operation requirements for an ankle assisting device
Giovanni Mastrangelo (University of Rome Tor Vergata); Marco Ceccarelli (University of Rome Tor Vergata); Matteo Russo (University of Rome Tor Vergata)

11:30-11:45 Development of a control algorithm for an ankle joint rehabilitation device
Zhetenbayev Nursultan (Almaty University of Power Engineering and Telecommunications); Gani Sergazin (Eurasian National University); Gulzhamal Tursunbayeva (Eurasian National University); Arman Uzbekbayev

(Applied science and technologies, LPP); Batyrkhan Kyrykbayev (Almaty University of Power Engineering and Telecommunications)

11:45-12:00 Exploration of AI-Enhanced Wearable Devices for Advanced Cardiovascular Monitoring in the Elderly
Daniele Cafolla (Swansea University)

12:00-13:30 Lunch & Poster Session Two

P01 Deep Relative Learning for Prediction of Preclinical Alzheimer's Disease
Nupur Thakur (Arizona State University); Riti Paul (Arizona State University); Baoxin Li (Arizona State University); Oana Dumitrascu (Mayo Clinic); Yuxiang Zhou (Mayo Clinic at Arizona)

P02 Bacterial Behaviour Analysis through Image Segmentation using Deep Learning Approaches
Afroza Rahman (University of East London); Khondaker Miraz Rahman (King's College London); Md Atiqur Rahman Ahad (University of East London)

P03 Word or Phoneme? To Optimise Prosodic Features to Predict Lung Function with Helicopter Task
Biao Zeng (University of South Wales); Hok-Shing Lau (University of Wales Trinity Saint David); Mark Huntly (University of Wales Trinity Saint David); Tim Bashford (University of Wales Trinity Saint David); Nathan Morgan (University of Wales Trinity Saint David); Chelsea Owen (University of South Wales); Lauren Game (University of South Wales)

P04 Electrical Impedance Spectroscopy based Preterm Birth Prediction with Machine Learning
Mengxiao Wang (the University of Sheffield); Ziqiang Lang (University of Sheffield)

P05 Transfer Learning in Hypoglycemia Classification
Beyza Cinar (Helmut-Schmidt-Universität - Universität der Bundeswehr Hamburg); Florian

	Grensing (Helmut-Schmidt-Universität - Universität der Bundeswehr Hamburg); Louisa van den Boom (Children's Hospital, University of Bonn, Bonn, Germany); Maria Maleshkova (Helmut-Schmidt-Universität - Universität der Bundeswehr Hamburg)
P06	A Comparative Analysis of Eleven Augmentation Techniques for Enhanced Retinal Pathology Recognition *Mahdi Hadef (EMP); Said Yacine Boulahia (école militaire polytechnique); abdenour amamra (EMP)*
P07	Multi-Stage Chronic Kidney Disease Classification on Longitudinal Data *Ali Guran (Swansea University); Gary Tam (Swansea University); James Chess (Wales Kidney Research Unit and Morriston Hospital); Xianghua Xie (Swansea University)*
P08	Contrastive Multitask Transformer for Hospital Mortality and Length-of-Stay Prediction *Fergus H Pick (Swansea University); Xianghua Xie (Swansea University); Lin Yuanbo Wu (Swansea University)*
P09	Machine and deep learning approaches for monitoring predictive in healthcare *Mauro Mazzei (CNR, Italian National Research Council)*
P10	Laboratory experiences with an intelligent robotic crank for arm exercises *Susana Sanz (University Carlos III of Madrid,); Vicente Díaz (University Carlos III of Madrid); Marco Ceccarelli (University of Rome Tor Vergata); Matteo Russo (University of Rome Tor Vergata)*
P11	ADALINE neurons used for targeting performance on the Deep Brain Stimulation platform *Karla N Silva Garces (Instituto Politecnico Nacional); Fiacro Jimenez-Ponce (Hospital General de México); Christopher René rené Torres SanMiguel (Instituto Politécnico Nacional)*

P12 DELRecon: Depth Electrode Reconstruction Toolbox for Stereo-EEG
Shameer Aslam (Swansea University); Qi Chen (South China Normal University); Jiaxiang Zhang (Swansea University)

P13 Segmenting breast ultrasound scans using a generative adversarial network embedding U-Net
Aboozar Taherkhani (De Montfort University); Fabio Caraffini (Swansea University); Hassan Eshkiki (Swansea university)

P14 Enhancing Predictive Accuracy in Embryo Implantation: The Bonna Algorithm and Its Clinical Implications
David H Silver (Rhea Labs); Daniel Fordham (Rhea Labs); Gilad Rave (Rhea Labs); Alex Bronstein (Technion)

P15 From poo to precision: AI-powered colorectal cancer detection
David S. Foster, Cerys A. Mitchell, Nerissa E. Thomas, Charles D. Brilliant, Adam I. Nixon, Nafiseh Badiei, Peter R. Dunstan and Dean A. Harris (CanSense)

P16 Sparse Deep Learning for Cell Type Classification in Breast Cancer Using Multiplex Imaging
Haiping Liu (Univerisity of Manchester), Yuxi Zhou(Univerisity of Manchester), Andrew Gilmore (Univerisity of Manchester), and Hongpeng Zhou (Univerisity of Manchester)

P17 Clinician feedback on the design features of an AI tool to identify Fabry disease
Vera Onongaya (Cardiff University), Matthew Ploszajski (Swansea University), Suraj Ramchand (Swansea University), Duncan Cole (Cardiff University) and Xianghua Xie (Swansea University)

P18 Bayesian Model-Based Meta-Analysis and Machine Learning: Aggregating averaged clinical data
Abraham Vaquero (London South Bank University)

Keynote

chair: Daniele Cafolla, Swansea University

13:30-14:30 **Development of life support devices by using Inclusive design**
Eiichiro Tanaka, Waseda University, Japan

Special Session: AI driven robotics for healthcare

chair: Daniele Cafolla, Swansea University

14:30-14:45 Towards Quantification of Eye Contacts Between Trainee Doctors and Simulated Patients in Consultation Videos
Yash Deshmukh (Keele University); Bappaditya Mandal (Keele University); Peter Yeates (Keele University); Jenni Watson (Keele University)

14:45-15:00 Promoting Healthy Eating Habits via Intelligent Virtual Assistants, Improving Monitoring by Nutritional Specialists: State of the Art
Jaime Cruz Casados (Universidad Autónoma de Tamaulipas); Miriam Janet Cervantes López (Universidad Autónoma de Tamaulipas); Richard de Jesús Gil Herrera (Universidad Internacional de la Rioja)

AI-aided medical imaging and analysis

chair: Xianghua Xie, Swansea University

15:00-15:15 FM-LiteLearn: A Lightweight Brain Tumor Classification Framework Integrating Image Fusion and Multi-Teacher Distillation Strategies
Shengbo Tan (Southwest Minzu University); Cai Ying (Southwest Minzu University); Yang Zhao (La Trobe University); Junjie Hu (Sichuan University); Yuanyuan Chen (Sichuan University); Chenxi He (Southwest Minzu University)

15:15-15:30 Towards improving single-cell segmentation in heterogeneous configurations of cardiomyocyte networks
Fabio Caraffini (Swansea University); Hassan Eshkiki (Swansea university); Mostafa Mohammadpour (Johannes Kepler University); Nikol Sullo (Swansea University); Christopher George (Swansea University)

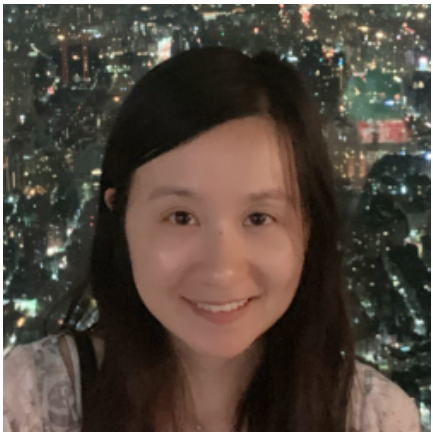
15:30-15:45 **Best Poster Prize & Closing remarks**

15:45-16:15 Leaving tea and coffee

Tutorial:
Deep Generative Neural Networks

Dr. Amir Atapour-Abarghouei is an Assistant Professor in the Department of Computer Science at Durham University in the UK. He has previously worked as a Lecturer in Computer Science at the School of Computing Science at Newcastle University in the UK. He received his Ph.D. degree from the Department of Computer Science at Durham University. He received his M.Sc. degree in 2010 and his B.Sc. in 2008. His primary research is currently focused on machine learning, deep learning, computer vision and natural language processing. His work includes the generalised high-impact GANomaly anomaly detection approach, which is now a part of Intel's AI product line and used as the underlying method for anomaly detection in numerous international patents. Amir has co-organised the CVPR-NAS workshop as well as workshops at IEEE Conf. BigData (BDA4CID and BDA4HM).

Keynote:
Signature-based ML models help sepsis prediction despite the subtle effects of label extraction



Hao Ni is a Professor of Mathematics at University College London (UCL) and a Turing Fellow at The Alan Turing Institute. She finished her DPhil in Mathematics at the University of Oxford. She held postdoctoral positions at ICERM and Department of Applied Mathematics at Brown University (2012 – 2013) and the Oxford-Man Institute of Quantitative Finance (2012 – 2016). She was an associate professor at the financial mathematics group, UCL from 2016 to 2022. Her research interests include stochastic analysis, machine learning and their applications. More specifically, she is interested in non-parametric modelling effects of complex multi-modal data streams through rough path theory and machine learning. Moreover, she has research interests on real-world applications, such as human-computer interface, computer vision and quantitative finance.

Keynote:
AI as the future of memory clinics: hype or happening?

Dr. Timothy Rittman is a Senior Clinical Research Associate at the University of Cambridge where he studies neurodegenerative disorders, combining neuroimaging, cognitive assessments and neuropathology to understand how these diseases progress through the brain. He has a particular interest in translating methods from artificial intelligence and big data for use in memory clinics. Tim co-leads the DEMON dementia network's Imaging Working group and is an adviser to the World Young Leaders in Dementia. He is an Honorary Consultant Neurologist at Addenbrookes hospital, as a consultant in the Addenbrookes Memory Clinic, leading a clinic for people with Progressive Supranclear Palsy and Corticobasal Degeneration, and co-leading a dementia genetics clinic.

Keynote:
Frameworks for reliable deployment of AI in medical imaging

Dr. Konstantinos Kamnitsas is Associate Professor of Engineering Science (Medical Imaging) at the Department of Engineering of the University of Oxford, and Non-Tutorial Fellow at Wolfson College. He is co-director of the EPSRC CDT in Healthcare Data Science (2024-). His research focuses on Machine-Learning (ML) and primarily deep neural networks for medical image analysis. His work has two main goals: 1) Develop reliable, transparent and accountable AI models for safe use in healthcare; 2) Empower radiologists, clinicians and researchers with intelligent ML-based tools to better address their research questions and needs of clinical workflows.

Konstantinos completed his PhD at Imperial College London in 2019, where he pioneered development of 3-dimensional neural networks for analysing volumetric medical data, such as MRI and CT, and methods for improving generalization to heterogeneous data. His work won various awards, among which international competitions for segmentation of cancer and stroke lesions. He previously obtained

an MSc in Computing Science from Imperial College, and Diploma in Electrical and Computer Engineering from Aristotle University of Thessaloniki, Greece. He has also conducted research in industry, such as at Microsoft Research and Kheiron Medical Technologies. He became Lecturer of Computer Science at the University of Birmingham in 2021, before moving to Oxford in 2022. He sits on the Editorial Board of the Medical Image Analysis (MedIA) journal.

Keynote:
Artificial Intelligence for multiple long-term conditions: clustering and beyond

Jacques Fleuriot is a full Professor in the School of Informatics and hold a Chair of Artificial Intelligence. He is head of the AI Modelling Lab (AIML), within the Artificial Intelligence and its Applications Institute (AIAI), Academic Lead and a member of the core management team for the University of Edinburgh's £20m Advanced Care Research Centre (ACRC). As part of the ACRC, Jacques lead the Integrated Technologies of Care research theme. He is the AI Lead on the NIHR Grant, Artificial Intelligence and Multimorbidity: Clustering in Individuals, Space and Clinical Context (AIM-CISC), and he is member of the Strategic Opportunities and Futures Board of the newly created University of Edinburgh's £7.5m Centre for Investing Innovation. His main field of research lies in AI Modelling, which spans areas such as interactive theorem proving, formal verification, process modelling, and AI/machine learning applied to health/care, medicine and other complex domains.

Keynote:
Development of life support devices by using Inclusive design

Eiichiro Tanaka is a full Professor at the Graduate School of Information, Production and Systems, Faculty of Science and Engineering, Waseda University, Japan. His research interests include mechanical design, mechanics, mechanical elements, and welfare engineering. He completed his doctoral program at the Tokyo Institute of Technology in 2003, and after working as a researcher at the Mechanical Engineering Research Laboratory of Hitachi, Ltd., he changed to an academic career. He has been in his current position since 2016.

His current main research interests are damage diagnosis for mechanical elements, especially gears, and the development of various life support devices. He has developed RE-Gait (R), a walking training assit robot for hemiplegic patients, and e.z.UP (R), a lifting motion assit suit for various workers, for which he has received many awards. These products have already been commercialized and sold

in Japan, and are already helping many patients, caregivers, and workers in factories and logistics.
The title of this talk is “Development of life support devices by using Inclusive design”. From the start of development, he has been developing various devices that assist human movement, discussing them not only with engineers but also with the people who will actually use the devices, such as patients, their families, and medical staff. However, in order to effectively carry out neurorehabilitation, it is important to provide assistance that is sensitive to the feelings of the subject, rather than simply providing physical assistance. He used neural network technology to estimate the subject’s emotions and fatigue from biological signals in real time, and built a system that induces emotions into a pleasurable and arousal state.He has confirmed its effectiveness and will introduce it in this keynote.

Plenary Panel:
Artificial Intelligence and Rare Diseases: Addressing Clinical Needs

Dr. Alba Di Pardo is an Italian medical geneticist with many years of experience in the field of genetic rare diseases and neurodegeneration. Dr. Di Pardo has more than 15 years of research experience and many years of professional genetic testing and counselling expertise in the field of rare genetic neurological conditions. During her career she has received different academic awards and has worked at some of the most respected Universities in the World.

Presently, Dr. Di Pardo works at Centre for Neurogenetics and Rare Disease at IRCCS Neuromed, Italy, as junior group leader and operates as medical geneticist at the Rare Disease Clinics at the same Institute.

She has extensive experience in preclinical and clinical research and she is author of several scientific peer- reviewed papers. Her

current research focuses on understanding common molecular mechanisms underlying different rare brain conditions.

Beside her scientific activity, Dr. Di Pardo actively collaborates with associations of patients affected with rare diseases and carries out dedicated dissemination and information programs via events, conferences, seminars and meetings.

Plenary Panel:
The challenge of translating ML research into practice in healthcare

Dr Al Moubayed is an Associate Professor at the department of computer science at Durham University, and Head of Applied Machine Learning and AI at Evergreen Life. Her main research interest is in Explainable Machine Learning, Natural Language Processing, and Optimisation. Dr Al Moubayed received her PhD from Robert Gordon University, followed by post-doctoral positions at the University of Glasgow and Durham University. Her research projects focus on applying machine learning and deep learning solutions in the areas of healthcare, social signal processing, cyber-security, and Brain-Computer Interfaces. All of which involve high dimensional, noisy and imbalance data challenges.

Dr Al Moubayed is an Associate Editor for IEEE Transactions on Emerging Topics in Computational Intelligence and N8 CIR Machine Learning team lead for Durham. She leads multiple projects in collaboration with different industrial partners with a team of over 15 researchers. Her research received several medial coverages (e.g. BBC, ITV, Time Magazine, and Wired Magazine) and she was ranked amongst the top 20 women in AI in the UK by RE•WORK 2019.

Plenary Panel:
AI and model generation in the pharmaceutical industry

Dr Mark graduated from the University of Bath with a BSc in Mathematics and stayed on to complete a PhD in what could be called Computational Neuroscience, building models of neurons and toying with the idea of building an electronic brain. Instead he joined the pharmaceutical industry, first at Novartis in Switzerland and is now at AstraZeneca in Cambridge, where he builds mechanistic models of potential oncology therapeutics with the hope of optimally designing their characteristics and bring meaningful benefits to cancer patients.

Venue & Local Information

The conference is hosted on the Bay Campus of the Swansea University. All the oral and poster presentation sessions are taking place in the Computational Foundry, which is home to the School of Mathematics and Computer Science. The building is labeled with number 11 on the campus map shown below.

The oral sessions are hosted in Room 002 and the poster sessions are in the Atrium that is just outside of the lecture theatre. Tea and coffee breaks are also served in the Atrium.

The Conference Reception takes place in the Crucible (Room 109) in the Computational Foundry.

The Conference Banquet is hosted in the George Hall inside the Brangywyn Hall, which is located east to Swansea City Centre and between Swansea University Singleton Park Campus and Swansea Marina.

There are bus services from the Bay Campus to city centre. The bus stop is on the west side of the Computational Foundry building. Local taxi you may use: Yellow Cabs 01792 477477

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