

AJCAI 2024
Australasian Joint Conference on Artificial Intelligence
November 25-29, 2024. Melbourne, Australia

Conference Booklet V1.2

Conference at a glance

Monday at RMIT University.

Location: Level 3, RMIT University Building 80. Address: 445 Swanston Street, Melbourne, VIC, 3000.

25 Monday	Room 03.05	Room 03.03	Room 03.04	Room 03.01
08:15	Registration: Level 3, RMIT University Building 80			
0900	Workshop 1	Tutorial 1	Tutorial 2	Tutorial 3
1030	Morning tea			
1100	Workshop 1	Tutorial 1	Tutorial 2	Tutorial 3
1230	Lunch			
1330	Workshop 1	Tutorial 4	Tutorial 5	Tutorial 6
1500	Afternoon tea			
1530	Workshop 1	Tutorial 4	Tutorial 5	Tutorial 6
1700	End			

Tuesday at RMIT University (Encore Track and PhD Forum)

Location: Levels 3 and 9, RMIT University Building 80. Address: 445 Swanston Street, Melbourne, VIC, 3000.

26 Tuesday	Room 03.03	Room 03.04	Room 09.10
08:15	Registration: Level 3, RMIT University Building 80		
0900	Encore 1A	Encore 1B	
1030	Morning tea (Level 3)		
1100	Encore 2A	Encore 2B	
1230	Lunch (Level 3)		
1330	Encore 3A	Encore 3B	PhD Forum
1500	Afternoon tea (Level 3)		
1530	Encore 4A	Encore 4B	PhD Forum
1700			PhD Forum
1730	End		

Tuesday at University of Melbourne, Defence AI Research Network (DAIRNET) Symposium

Location: Melbourne Connect, Mezzanine level (Superfloor). Address: 700 Swanston St, Carlton.

26 Tuesday	Forum 1 and 2
08:15	Registration: Mezzanine Level, Melbourne Connect
0900	DAIRNET Symposium
1010	Morning tea
1030	DAIRNET Symposium
1200	Lunch
1300	DAIRNET Symposium
1420	Afternoon tea
1450	DAIRNET Symposium
1700	End

Wednesday at University of Melbourne. Location: Melbourne Connect, Mezzanine level (Superfloor). Address: 700 Swanston St, Carlton.

27 Wednesday	Forum 1+2	Forum 3
08:15	Registration: Mezzanine Level, Melbourne Connect	
0900	Welcome	
0905	Keynote: Liming Zhu	
1000	Morning tea (Launchpad)	
1030	Session 1A	Session 1B
1210	Lunch (Launchpad)	
1310	Keynote: Dinh Phung	
1410	Afternoon tea (Launchpad)	
1440	Session 2A	Session 2B
1620	Reception (Launchpad)	
1730	End	

Thursday at University of Melbourne.

Location: Melbourne Connect, Mezzanine level (Superfloor). Address: 700 Swanston St, Carlton.

28 Thursday	Forum 1+2	Forum 3	M01+M02	M03
0830		Registration: Mezzanine Level, Melbourne Connect		
0930	Keynote: Aman Verma			
1030		Morning tea (Launchpad)		
1100	Industry 1	Session 3A	Session 3B	
1240		Lunch (Launchpad)		
1330	Industry 2	Session 4A	Session 4B	
1500		Afternoon tea (Launchpad)		
1530	Industry 3	Session 5A	Session 5B	Session 5C
1700		End		
1830		Conference Dinner and Award Ceremony (for 3 or 5 day attendees, see general information later in this booklet)		

Friday at University of Melbourne. Location: Melbourne Connect, Mezzanine level (Superfloor).

Address: 700 Swanston St, Carlton.

29 Friday	Forum 1+2	Forum 3	M01+M02
0830		Registration: Mezzanine Level, Melbourne Connect	
0900	Keynote: Flora Salim		
1000		Morning tea (Launchpad)	
1030		Special session	
1230		Lunch (Launchpad)	
1330	Session 6A	Session 6B	Session 6C
1450		End	

Sponsors

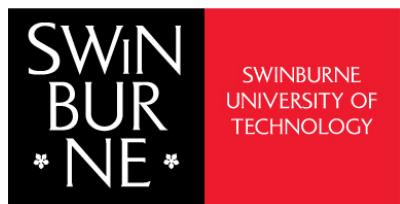
Gold



Silver



Bronze



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Learning

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Welcome

It is our great pleasure to welcome you to the 37th Australasian Joint Conference on AI (AJCAI 2024). Since the first AI Conference took place in Sydney in 1987, the series of the annual Australasian Joint Conference on Artificial Intelligence has become the premier event for Artificial Intelligence researchers in Australasia and one of the major international forums on AI worldwide.

We are delighted to present four outstanding keynote speakers: Liming Zhu (Data61/CSIRO); Dinh Phung (Monash); Aman Verma (Accenture) and Flora Salim (UNSW). We are also honored to host distinguished invited speakers for Industry Day on Thursday and Special Session on Friday.

In addition to keynotes and the papers at the main conference, the AJCAI program includes 6 tutorials, 1 workshop, the Defence AI Research Network Symposium, PhD Forum, Encore Track, Industry Day and Special Session.

We are indebted to the many authors who submitted their work to the AJCAI technical program, and to the team of people who evaluated them. The Program Committee was expertly led by three PC Chairs: Mingming Gong, Yiliao Song and Yun Sing Koh.

We also thank the other chairs in the organization team: Yu Yao (Encore Track); Jeffrey Chan and Richard Skarbez (Workshops); Wei Xiang and Derui Wang (Proceedings); Sunil Gupta and Estrid He (Tutorials); Mel McDowell and Jacinta Lamacchia (DAIRNET), Zongyuan Ge and Kai Chin (Sponsorship); Farhana Chouhury (Finance); Hanxun Huang (Registration); Shirui Pan and Dong Gong (Publicity); Feng Xia and Usman Naseem (PhD Forum); Chang Xu and Yasmeen George (Special Session); Greg Cameron, Tingrui Cui and Wei Zhang (Industry Day); Zhen Zhang (Web).

Running a conference the scale of AJCAI is a serious undertaking and we are grateful to our local organization team for their effective and efficient handling of logistics. In particular, the Local Arrangements Chairs Feng Liu and Haytham Fayek provided extensive support, as did the team of student volunteers that Feng and Haytham helped recruit and manage.

We gratefully acknowledge the support of our sponsors for the conference: University of Melbourne and ACS as Gold Sponsors; DAIRNET, Melbourne Connect, Pioneer.au, RMIT University and YEPAI as Silver Sponsors; Australian Institute for Machine Learning and Swinburne University of Technology and T-power as Bronze Sponsors.

We trust that you enjoy all of the work presented at the conference, and also the further activities you are able to fit in during your visit to Melbourne. Indeed, there are many things to see and enjoy in Victoria and in the whole Australasian region at this time of year, and we hope that you will be able to combine business and pleasure into a memorable experience while you are here. Finally, AJCAI 2025 will be in Canberra and we hope to see you again there.

*Sarah Erfani and James Bailey
The University of Melbourne
November 2024*

Conference Organizing Committee

General Chairs

- Sarah Erfani, The University of Melbourne, Australia
- James Bailey, The University of Melbourne, Australia

Program Committee Chairs

- Mingming Gong, The University of Melbourne, Australia
- Yiliao Song, The University of Adelaide, Australia
- Yun Sing Koh, The University of Auckland, New Zealand

Local Arrangements Chairs

- Feng Liu, The University of Melbourne
- Haytham Fayek, RMIT University

Workshop Chairs

- Jeffrey Chan, RMIT University
- Richard Skarbez, La Trobe University

Tutorial Chairs

- Estrid He, RMIT University
- Sunil Gupta, Deakin University

Industry Day Chairs

- Greg Cameron, The University of Melbourne
- Tingrui Cui, The University of Melbourne
- Wei Zhang, The University of Adelaide

Special Session Chairs

- Chang Xu, University of Sydney
- Yasmeen George, Monash University

Sponsorship Chairs

- Zongyuan Ge, Monash University
- Kai Qin, Swinburne University

Encore Track Chair

- Yu Yao, The University of Sydney

Proceedings Chairs

- Wei Xiang, La Trobe University
- Derui Wang, Data61

Registration Chair

- Hanxun Huang, The University of Melbourne

Web Chair

- Zhen Zhang, University of Adelaide

Finance Chair

- Farhana Choudhury, The University of Melbourne

Publicity Chairs

- Shirui Pan, Griffith University
- Dong Gong, University of New South Wales

PhD Forum Chairs

- Feng Xia, RMIT University
- Usman Naseem, Macquarie University

Registration and Conference Location

The conference will be held at two locations in central Melbourne. It is approximately a 15min walk between them.

- (Monday-Tuesday): RMIT University, Building 80, Levels 3 and 9. Address: 445 Swanston Street, Melbourne, VIC, 3000.
- (Tuesday-Friday): Melbourne Connect (Mezzanine level - Superfloor): Address: 700 Swanston St, Carlton VIC 3053. A room map is provided at the end of this booklet.

Depending on what type of package you are registered for, you can pick up your registration badge at the following times.

- Registration will be open at RMIT (Level 3) on Monday and Tuesday morning from 0815am.
- Registration for DAIRNET will be open at Melbourne Connect on Tuesday morning from 0815am.
- Registration will be open at Melbourne Connect on Wednesday morning from 0815am, Thursday morning from 0830am and Friday morning from 0830am.

Schedule

Monday: Workshop and tutorials

These will run on Level 3 of RMIT University, Building 80, rooms 01, 03, 04, 05. The workshop will run all day (0900-1700) in parallel with 3 morning tutorials (0900-12:30) and 3 afternoon tutorials (1330-1700). There will be a tea break 1000-1030, lunch 1230-1330 and afternoon tea break 1500-1530.

- Workshop 1 (Room 05, Level 3, all day)
- Towards Federated Machine Intelligence
 - Guodong Long, University of Technology Sydney, Australia; Han Yu, Nanyang Technological University, Singapore; Di Wu, University of Southern Queensland, Australia
 - Abstract: The recent development of foundation models uplifts each agent's intelligence ability. Given a collaborative learning environment with a federated setting, it is a promising direction to form a new type of collective intelligence, namely federated machine intelligence (FedMI), that aims to develop numerous personalised intelligence agents in a cooperative environment. This workshop aims to gather researchers to explore the potential future of federated machine intelligence. Moreover, there is a trend that the current cloud computing-based centralised AI service architecture will significantly deepen the digital divide and wealth inequality, and also raise serious concerns about privacy protection, data sovereignty and knowledge monopolisation. Can the federated machine intelligence become an alternative pathway to advance future AI technology?
- Tutorial 1 (Room 03, Level 3, morning)
 - Towards Safe and Controlled Large Language Models.
 - Hung Le and and Manh Nguyen, Deakin University.
 - Website: <https://thaihungle.github.io/talks/2024-11-25-AJCAI>

Abstract: Large Language Models (LLMs) have significantly advanced natural language generation, yet they can produce dangerously flawed outputs, such as misinformation in medical advice or content that violates ethical standards. This tutorial explores these pressing issues and presents cutting-edge methods for creating safer, more controlled LLMs. Part I focuses on understanding hallucinations—instances where LLMs generate confidently incorrect or misleading information. It presents a taxonomy of hallucinations, and covers techniques for detecting them, including uncertainty assessment methods, score-based detection, and advanced model-based approaches. Part II studies various strategies to mitigate hallucinations and enhance LLM reliability, such as reinforcement learning with human feedback to align models with human values, and direct preference optimization to fine-tune behaviour. It also examines prompt optimization methods to guide LLMs towards safer, more accurate responses without extensive retraining. Through practical examples and case studies, participants will learn essential tools and techniques to build LLMs that are not only powerful but also safe, reliable, and aligned with ethical standards.

-
- Tutorial 2 (Room 04, Level 3, morning)
 - Continual Learning for Large Language Models
 - Tongtong Wu and Trang Vu, Monash University
-

- Tutorial 3 (Room 01, Level 3, morning)
- Instance Space Analysis for Rigorous and Insightful Algorithm Testing (ISA)
- Kate Smith-Miles and Mario Andres Munoz, The University of Melbourne.

Standard practice in algorithm testing consists of reporting performance on-average across a suite of well-studied benchmark instances. Therefore, the conclusions drawn during this process critically depend on the choice of benchmarks and comparison algorithms. Ideally, benchmark suites are unbiased, challenging, and contain a mix of synthetically generated and real-world-like instances with diverse structural properties. Without this diversity, the conclusions that can be drawn about the expected algorithm performance in future scenarios are necessarily limited. Moreover, reporting performance on-average often highlights the strengths, while disguising the weaknesses, of an algorithm. In other words, there are two limitations to the standard benchmarking approach that affect the conclusions that can be drawn: (a) there is no mechanism to assess whether the selected test instances are unbiased and diverse enough to support the conclusions drawn; and (b) there is little opportunity to gain insights into the strengths and weaknesses of algorithms for different types of instances when hidden by on-average performance metrics.

This tutorial introduces Instance Space Analysis (ISA): a methodology for evaluating algorithm performance and benchmark diversity. ISA aims to improve the way algorithms are evaluated by revealing relationships between the structural properties of problem instances and their impact on the performance of algorithms. ISA offers a more nuanced opportunity to gain insights into algorithm strengths and weaknesses for various types of test instances, and to objectively assess the relative power of algorithms, free from any bias introduced by the choice of test instances. ISA constructs an instance space whereby test instances can be visualised as points in a 2d plane, with algorithm footprints identified as the regions of predicted good performance of an algorithm, based on statistical evidence from empirical testing.

The tutorial makes use of the on-line tools available at the Melbourne Algorithm Test Instance Library with Data Analytics (MATILDA, see matilda.unimelb.edu.au). MATILDA also provides a collection of ISA results and other meta-data available for downloading for several well-studied problems from optimisation and machine learning, from previously published studies.

- Tutorial 4 (Room 03, Level 3, afternoon)
- Towards Autonomous ML: Evolution of AutoML, Roles Of Humans, and Related Topics.
- Bogdan Gabrys and Thanh Tung Khuat, University of Technology Sydney.
- Website: <https://uts-caslab.github.io/autonoml-tutorial/>

Recent years have seen an unprecedented level of technological uptake and engagement by the mainstream. From deepfakes for memes to recommendation systems for commerce, machine learning (ML) has become a regular fixture in society. This ongoing transition from purely academic confines to the general public is not smooth as the public does not have the extensive expertise in data science required to fully exploit the capabilities of ML. As automated machine learning (AutoML) systems continue to progress in both sophistication and performance, it becomes important to understand the 'how' and 'why' of human-computer interaction (HCI) within these frameworks. This is necessary for optimal system design and leveraging advanced data-processing capabilities to support decision-making involving

humans. It is also key to identifying the opportunities and risks presented by ever-increasing levels of machine autonomy.

This tutorial provides an expansive perspective on what constitutes an automated/autonomous ML system and how humans interact with such systems. The authors also focus on the following questions: (i) What does HCI currently look like for state-of-the-art AutoML algorithms? (ii) Do the expectations of HCI within AutoML frameworks vary for different types of users and stakeholders? (iii) How can HCI be managed so that AutoML solutions acquire human trust and broad acceptance? (iv) As AutoML systems become more autonomous and capable of learning from complex open-ended environments, will the fundamental nature of HCI evolve? To consider these questions, the authors project existing literature in HCI into the space of AutoML and review topics such as user-interface design, human-bias mitigation, and trust in artificial intelligence (AI). Additionally, to rigorously gauge the future of HCI, they contemplate how AutoML may manifest in effectively open-ended environments. Ultimately, this tutorial serves to identify key research directions aimed at better facilitating the roles and modes of human interactions with both current and future AutoML systems.

- Tutorial 5 (Room 04, Level 3, afternoon)
- Theory and Practice of AI Safety
- Andrew Cullen and Hanxun Huang, The University of Melbourne.
- Website: <https://ai-safety-ajcai2024.github.io>

The growing prevalence of machine learning and artificial intelligence in real-world systems has opened up a new threat surface for attackers to exploit. In effect, cybersecurity has returned to a Wild West era, where attackers are empowered to both exploit the manifold vulnerabilities present in machine learning and to leverage machine learning to better construct traditional cyberattacks. This tutorial will focus on introducing participants to modern adversarial machine learning, how it intersects with cybersecurity practice, and discuss best practices in defending against these risks.

- Tutorial 6 (Room 01, Level 3, afternoon)
- Functional Bayesian Deep Learning: Beyond Function Approximation to Function Distribution Approximation
- Junyu Xuan, University of Technology Sydney
- Website: <https://ajcai24.deepbayes.cc/>

Bayesian deep learning (BDL) is an emerging field that combines the strong function approximation power of deep learning with the uncertainty modelling capabilities of Bayesian inference. This synergy is poised to enhance model generalization and robustness, offering valuable uncertainty estimations for a range of safety-critical applications, including medical diagnostics, diabetes detection, autonomous driving, and civil aviation. Despite these advantages, the fusion introduces complexities to classical posterior inference in parameter space, such as nonmeaningful priors, intricate posteriors, and possible pathologies. This tutorial will delve into the driving forces, concepts, and methodologies underpinning BDL in function space, segueing into pivotal technological breakthroughs and their applications in machine learning tasks. To conclude, we will explore the prevailing hurdle faced by BDL.

Tuesday: Encore Track

The encore track will be held on Level 3 of RMIT University, Building 80, rooms 03 and 04. It will run all day (0900-1700) in two parallel sessions. There will be a tea break 1000-1030, lunch 1230-1330 and afternoon tea break 1500-1530.

The Encore track is designed to disseminate significant works that have already been presented at other prestigious venues and to foster further interactions and discussions among researchers.

Tuesday, 0900-1020: Encore Session 1

1A

Room: 03.03
Chair: Bang Wu

- *Training Sparse Graph Neural Networks via Pruning and Sprouting.* Xueqi Ma.
- *Physicochemical Graph Neural Network for Learning Protein–Ligand Interaction Fingerprints from Sequence Data.* Huan Yee Koh.
- *A Deep Probabilistic Spatiotemporal Framework for Dynamic Graph Representation Learning with Application to Brain Disorder Identification.* Sin-Yee Yap.

1B

03.04
Chair: Richard Skarbez

- *Federated Recommendation with Additive Personalization.* Zhiwei Li.
- *Federated Prompt Learning for Weather Foundation Models on Devices.* Shengchao Chen.
- *Personalized Adapter for Large Meteorology Model on Devices: Towards Weather Foundation Models.* Shengchao Chen.

Tuesday, 1100-1220: Encore Session 2

2A

Room: 03.03
Chair: Xiaoyu Xia

- *Visual-Text Cross Alignment: Refining the Similarity Score in Vision-Language Models.* Jinhao Li.
- *Bayesian-guided Label Mapping for Visual Reprogramming.* Zesheng Ye.
- *LongVLM: Efficient Long Video Understanding via Large Language Models.* Yuetian Weng.
- *MVSplat360: Feed-Forward 360 Scene Synthesis from Sparse Views.* Yuedong Chen.

2B

03.04
Chair: Lia Song

- *SWAP-NAS: Sample-Wise Activation Patterns for Ultra-fast NAS.* Yameng Peng.
- *Perceiving Longer Sequences With Bi-Directional Cross-Attention Transformers.* Markus Hiller.
- *Diversity-enhancing Generative Network for Few-shot Hypothesis Adaptation.* Ruijiang Dong.
- *H-CapsNet: A capsule network for hierarchical image classification.* Khondaker Tasrif Noor.

Tuesday, 1330-1450: Encore Session 3

3A

Room: 03.03
Chair: Ziqi Xu

- *Optimal Kernel Choice for Score Function-based Causal Discovery.* Wenjie Wang.
- *Causal Inference with Conditional Front-Door Adjustment and Identifiable Variational Autoencoder.* Ziqi Xu.
- *Identifiability Analysis of Linear ODE Systems with Hidden Confounders.* Yuanyuan Wang.
- *On The Exploration of Local Significant Differences for Two-Sample Test.* Zhijian Zhou.

3B

03.04
Chair: Xiaoning Liu

- *Improving Accuracy-robustness Trade-off via Pixel Reweighted Adversarial Training.* Jiacheng Zhang.
- *Exploiting Inter-Sample Information for Long-tailed Out-of-Distribution Detection.* Nimeshika Udayangani.
- *Scissorhands: Scrub Data Influence via Connection Sensitivity in Networks.* Jing Wu.

Tuesday, 1530-1710: Encore Session 4

4A

Room: 03.03
Chair: Zesheng Ye

4B

03.04
Chair: He Zhang

- *Series2vec: Similarity-Based Self-Supervised Representation Learning for Time Series Classification.* Navid Mohammadi Foumani.
- *QUANT: A Minimalist Interval Method for Time Series Classification.* Angus Dempster.
- *EEG2Rep: Enhancing Self-supervised EEG Representation Through Informative Masked Inputs.* Navid Mohammadi foumani.
- *CARLA: Self-Supervised Contrastive Representation Learning for Time Series Anomaly Detection.* Zahra Zamanzadeh Darban.
- *DeCoRTAD: Diffusion Based Conditional Representation Learning for Online Trajectory Anomaly Detection.* Chen Wang.
- *Erasing Undesirable Concepts in Diffusion Models with Adversarial Preservation.* Tuan Anh Bui.
- *Ethics in the Age of AI: An Analysis of AI Practitioners' Awareness and Challenges.* Aastha Pant.

Tuesday: PhD Forum

The PhD forum will be held on Level 9 of RMIT University, room 010. It will run in the afternoon (1330-1730), with a tea break 1500-1530. Tea break will be held on Level 3 near room 03.04.

- PhD Forum (Room 10, Level 9, 1330-1730)
- Organisers: Feng Xia and Usman Naseem

Participants will showcase their research through both lightning talks and poster presentations, engage in discussions with senior AI researchers and peers, explore opportunities for potential collaborations, establish friendships, and benefit from mentorship on both research and career development.

- 1:30 PM – 1:40 PM Opening Remarks
- 1:40 PM – 3:00 PM Lightning Presentations
- 3:00 PM – 3:30 PM Posters (Level 9, Room 10) & Afternoon Tea (Level 3)
- 3:30 PM – 5:00 PM Invited Talks & Success Story Sharing
 - *PhD and Beyond: Pathway to Innovation.* Ivan Lee (University of South Australia).
 - *The Power of Perseverance: Reflections on my Research Path.* Leah Gerrard (University of Technology Sydney & Australian Government Department of Health and Aged Care).
 - *Research, Resilience, and Careers: Lessons from My PhD.* Suyu Ma (CSIRO's Data61).
- 5:00 PM – 5:10 PM Best Poster Award
- 5:10 PM – 5:25 PM Speed Mentoring & Social Networking
- 5:25 PM – 5:30 PM Closing

Lightning Presentation Schedule

P1	Concept Based Clinical Text Description Generation	Abir Naskar, Jane Hocking, Patty Chondros, Douglas Boyle, and Mike Conway (University of Melbourne)
P2	LLMs' morphological analyses of complex FST-generated Finnish words	Anssi Moisio (Aalto University), Mathias Creutz (University of Helsinki), and Mikko Kurimo (Aalto University)
P3	Graph Learning of Connectomics for Brain Disorder Analysis	Chengyao Xie (Federation University Australia)
P4	Multimodal Brain Graph Representation Learning	Ciyuan Peng, Xiaohui Zhao, Kathleen Keogh, and Suryani Lim (Federation University Australia)
P5	Decoding Biomolecular Interactions from Sequence Data with Deep Learning Approaches	Huan Yee Koh, Anh T.N. Nguyen (Monash University), Shirui Pan (Griffith University), Lauren T. May, and Geoffrey I. Webb (Monash University)
P6	Have ADHD and autism converged over time? A temporal computational analysis of Reddit data	Jemima Kang, Nick Haslam, Mike Conway (University of Melbourne)

P7	RoboNet: A Sample-Efficient Robot Co-designer	Kishan Reddy Nagireddla, Arun Kumar A V, Thommen George Karimpanal, and Santu Rana (Deakin University)
P8	Transformer-based Approaches for Modelling Cancer Pathways with Electronic Health Data	Leah Gerrard (University of Technology Sydney)
P9	Graph Link Prediction using Multi-Scale Line Graph Neural Networks	Manizheh Ranjbar (RMIT University)
P10	A survey on deep learning based polygenic risk score prediction	Max Schuran, Benjamin Goudey, Gillian Dite (University of Melbourne), and Enes Makalic (University of Melbourne & Monash University)
P11	Explainable Graph Learning for Psychiatric Disorder Detection	Mujie Liu, Jiangang Ma, Vidya Saikrishna (Federation University Australia), and Ting Dang (University of Melbourne)
P12	AI Can Code, But Can It Teach Programming? Improving Intelligent Tutoring in Computer Science	Pagnarith Pit, Tanya Linden, Ekaterina Vylomova, Simon D'Alfonso (University of Melbourne)
P13	Low-resource Machine Translation: what for? who for? An observational study on a dedicated Tetun language translation service	Raphaël Merx, Ekaterina Vylomova, Nick Thieberger (University of Melbourne), Hanna Suominen (Australian National University)
P14	Variational Autoencoder Approach to Capture Membrane Fouling Dynamics	Saumya Karunadhika, Bastian Oetomo, Uwe Aickelin, and Ling Luo (University of Melbourne & ARC Digital Bioprocess Development Hub)
P15	Deep Reinforcement Learning for Roll Attitude Control of Winged Unmanned Aerial Vehicles in Turbulence	Sayr Bahri (RMIT University & BRIN), Simon Watkins, Timothy Wiley, and Abdulghani Mohamed (RMIT University)
P16	A Machine Learning Framework for Vehicle Mode Shape Identification	Sitthichart Tohmuang, Mohammad Fard, and Haytham Fayek (RMIT University)
P17	Capturing uncertainty in black-box chromatography modelling using conformal prediction and Gaussian processes	Tien Dung Pham (University of Melbourne), Robert Bassett (CSL Innovation), and Uwe Aickelin (University of Melbourne)
P18	Commonsense Q&A Based on Augmented Large Language Models	Wei Han (RMIT University) and Joseph G. Davis (University of Sydney)
P19	Beyond Perception: Evaluating Abstract Visual Reasoning through Multi-Grained, Multi-Stage Tasks	Yanbei Jiang, Yihao Ding, Chao Lei, Jiayang Ao, Jey Han Lau, and Kris Ehinger (University of Melbourne)
P20	Transformer-based Fusion and Processing Irregularly Sampled Time Series and Text Data	Yuwei Wang, Bowen Li, Bohan Cheng, Fengling Han and Jenny Zhang (RMIT University)

Tuesday: Defence AI (DAIRNET) Symposium

The DAIRNET Symposium will run 0900-1700 at Melbourne Connect (Mezzanine level - Superfloor): Address: 700 Swanston St, Carlton.

- DAIRNET Symposium (Forum 1+2, all day)
- Organisers: Mel McDowell and Jacinta Lamacchia
- Program: <https://www.dairnet.com.au/events/dairnet-ai-symposium-2024/>

The Defence Artificial Intelligence Research Network (DAIRNet) brings together scientists, policymakers, legal experts, procurement experts and end-users to develop effective ways to use artificial intelligence (AI) to support Australia's Defence capabilities. DAIRNet is a unique and national network that aims to develop and support a community of practice for the Defence AI ecosystem, from researchers, academia and industry through to Defence and end-users, from concept to capability.

DAIRNet Schedule

8:15-9:00	Registration
9:00 - 9:10	Welcome and introduction. Dr Mel McDowall, Director of DAIRNet
9:10 - 9:40	Keynote address: Defence IS&T Strategy with AI focus
9:40 - 10:10	Fireside chat - Facilitator: Dr Ralph Gailis, DSTG; Dr Dale A. Lambert, previously DSTG; Professor Jennifer Palmer, RMIT University. Scaling AI in Defence.
10:10 - 10:30	Morning tea break
10:30 – 12:00	Presentations Chair: Associate Professor Belinda Chiera, UniSA Dr Truyen Tran, Deakin University Professor Hanna Kurniawati, Australian National University Dr Zygmunt Szpak, Insight Via Artificial Intelligence (IVAI) Pty Ltd
12:00 – 13:00	Lunch break
13:00 – 14:00	Presentations Chair: Associate Professor Belinda Chiera, UniSA Dr Kobi Leins, Consultant with Info Sphere Education Dr Liming Zhu, DATA61 CSIRO
14:00 – 14:20	Workshop and case study introductions. Facilitator: Professor John Thangarajah, RMIT University
14:20 – 14:50	Afternoon tea break
14:50 – 16:00	Workshop with case studies
16:00 – 16:20	Workshop debrief. Facilitator: Professor John Thangarajah, RMIT University
16:20 – 16:30	Closing remarks
16:30 – 17:00	Networking
17:00	Offsite networking

Wednesday, 0900-1000: Keynote: Liming Zhou

Trustworthy AI: From Model to System to Agent

Room: Forum 1+2

Chair: Mingming Gong



Abstract: Any AI model, from narrow AI models to general-purpose frontier AI models, is only a part of the overall AI system. Many out-of-model components can amplify or mitigate model risks and subsequently impact the entire AI system trustworthiness. These out-of-model components range from input/output filters and prompt engineering to sophisticated scaffolding, access to knowledge bases, and tools in different deployment contexts. Additionally, some of these systems may be designed to be agentic, becoming more autonomous with humans providing only high-level and longer-term goals with limited supervision. This talk will explore how we can ensure the trustworthiness of AI across the spectrum from models to systems to agents, making them safe and responsible, and consequently enhancing human trust in such systems.

Bio: Dr Liming Zhu is a Research Director at CSIRO's Data61, the AI/digital arm of Australia's national science agency, and a conjoint professor at UNSW. He contributes to the OECD.AI's AI Risks and Accountability, the Responsible AI at Scale think tank at Australia's National AI Centre, ISO AI standards committees, and Australia's AI safety standard. His research division innovates in AI engineering, responsible/safe AI, blockchain, quantum software, privacy, and cybersecurity, and hosted Australia's Consumer Data Right/Open Banking standards setting. Dr Zhu has authored over 300 papers and is a regular keynote speaker. He delivered the keynote "Software Engineering as the Linchpin of Responsible AI" at the International Conference on Software Engineering. His latest book, "Responsible AI: Best Practices for Creating Trustworthy AI Systems" and "Engineering AI Systems: Architecture and DevOps Essentials," reflect his vision for the rigorous engineering of responsible and safe AI systems for society.

Wednesday, 1030-1210: Session 1

1A

Room: Forum 1+2

Chair: Dong Gong

- *DELA: Dual Embedding Using LSTM and Attention for Asset Tag Inference in Industrial Automation Systems.* Zhen Zhao, Brian Kenneth Erickson, Shantanu Chakraborty, Wei Liu
- *Combined Change Operators for Trust and Belief.* Aaron Hunter
- *Highlighting Case Studies in LLM Literature Review of Interdisciplinary System Science.* Lachlan McGinness, Peter Baumgartner, Esther Onyango, Zelalem Lema.
- *Legal Judgment Prediction through Argument Analysis.* Azmi, Meladel Mistica, Inbar Levy, Eduard Hovy.
- *Conditional Prototypical Optimal Transport for Enhanced Clue Identification in Multiple Choice Question Answering.* Wangli Yang, JACK Yang, Wanqing Li, Yi Guo.

1B

Forum 3

Chair: Lizhen Qu

- *Localization System Enhanced with CDLPE: A Low-Cost, Resilient Map-Matching Algorithm.* Yanyan Wang.
- *FocDepthFormer: Transformer with latent LSTM for Depth Estimation from Focal Stack.* Xueyang Kang, Fengze Han, Abdur R Fayjie, Patrick Vandewalle, Kourosh Khoshelham, Dong Gong.
- *TSI: A Multi-View Representation Learning Approach for Time Series Forecasting.* Wentao Gao, Ziqi Xu, Jiuyong Li, Lin Liu, Jixue Liu, Thuc Duy Le, Debo Cheng, Yanchang Zhao, Yun Chen.
- *Designing an Adaptive AI System for Operation on Board the SpIRIT Nanosatellite.* Zaher Joukhadar, Jonathan Morgan, Christopher Bayliss, Miguel Ortiz del Castillo, Jack McRobbie, Robert Mearns, Krista A. Ehinger, Benjamin I. P. Rubinstein, Richard Sinnott, Michele Trenti, James Bailey.
- *LSTM Autoencoder-based Deep Neural Networks for Barley Genotype-to-Phenotype Prediction.* Guanjin Wang, Junyu Xuan, Penghao Wang, Chengdao Li, Jie Lu.

Wednesday, 1310-1410: Keynote Dinh Phung

Matching Distribution to Learn via Optimal Transport

Room: Forum 1+2

Chair: Sarah Erfani



Abstract: I will discuss the problem of matching distributions and probabilities as an emerging approach to solve several learning tasks. This includes the discussion of statistical divergences and their desirable properties and limitations, which leads to my motivation to optimal transport and Wasserstein distance. A brief historical development will be introduced with an emphasis on their properties and possible uses for diverse machine learning tasks. I will then conclude with discussing how they can be specifically utilised to solve important tasks in the domains such as robust machine learning, generative modelling, domain transfer and graphical models.

Bio: Dinh Phung is a Professor and Head, Department of Data Science and AI, Monash University, Australia – where it hosts approximately 50 staff and 150 PhD students dedicated fully to advancing the frontiers of AI research and education. His research interests broadly cover machine learning and artificial intelligence, including the young field of optimal transport mathematics theory in deep learning, trustworthy AI and graphical models. He has won numerous best research awards, published several technical papers and attracted research substantial fundings in these areas. He was the Finalist for the prestigious Australian Museum Eureka Prize for Excellence in Data Science in 2020 and the current Editor-In-Chief for the living edition of the Encyclopedia in Machine Learning and Data Science.

Wednesday, 1440-1620: Session 2

2A

Room: Forum 1+2

Chair: Trang Vu

- *REFINE on Scarce Data: Retrieval Enhancement through Fine-Tuning via Model Fusion of Embedding Models.* Ambuje Gupta, Mrinal Rawat, Andreas Stolcke, Roberto Pieraccini.
- *Leveraging LLM in Genetic Programming Hyper-Heuristics for Dynamic Microservice Deployment.*
- *Bidirectional Dependency Representation Disentanglement for Time Series Classification.*
- *SCODA - A Framework for Software Capability Representation and Inspection.*
- *Some Considerations for the Preservation of Endangered Languages Using Low-Resource Machine Translation.*

2B

Forum 3

Chair: Haytham Fayek

- *An Improved Prescriptive Tree-based Model for Stochastic Parallel Machine Scheduling.* Siping Chen, Debiao Li, Nasimul Noman, Kyle Robert Harrison, Raymond Chiong.
- *Economic Graph Lottery Ticket: A GNN based Economic Forecasting Model.* Htoo Wai Aung, Ying Guo, Jiaming Li, Geoff Lee, Zili Zhu.
- *Pattern-based Trading by Continual Learning of Price and Volume Patterns.* Patrick Liston, Charles Gretton, Artem Lensky.
- *An Experimental Study on Decomposition-Based Deep Ensemble Learning for Traffic Flow Forecasting.* Qiyuan Zhu, A. K. Qin, Hussein Dia, Adriana-Simona Mihaita, Hanna Grzybowska.
- *DBSSM: Deep BERT-based Semantic Skill Matching from Resumes to a Public Skill Taxonomy.* Haohui Chen, Claire Mason, Yanchang Zhao, Qinyong Wang.

Thursday, 0930-1030: Keynote Aman Verma

Title: Driving Safe and Responsible AI in Australia and Beyond

Room: Forum 1+2

Chair: James Bailey



Abstract: This talk will cover four key topics:

- What does Responsible AI mean for organisations?
- Global and local industry landscape in terms of adoption of Responsible AI practices
- Implications of the proposed mandatory guardrails in Australia
- Emerging themes and learnings from our experience

Bio: Aman Verma is the ANZ Responsible AI Capability Lead for Accenture in the Australia and New Zealand region. He is a seasoned Risk professional with experience in working with large global organizations and regulators across North America, SE Asia, Europe and ANZ. He has pioneered work in AI and ML Risk Management, governance and large-scale adoption of AI solutions.

Thursday 28 November: Industry Day Program

Room: Forum 1+2
Chair: Greg Cameron

9.30 – 9.35 am	Welcome
9.35 – 10.30 am	Keynote Presentation: Driving Safe and Responsible AI in Australia and Beyond. Speaker: Aman Verma, ANZ Responsible AI Capability Lead for Accenture
10.30 – 11.00 am	Morning tea
11.00 – 11.05	Overview of Industry Day Agenda
11.00 - 11.50 am	Session 1: Navigating a pathway to responsible and safe AI for Australian businesses. Speaker: Prof Jeannie Paterson, Director - Centre of Artificial Intelligence and Digital Ethics
11.50 - 12.30 pm	Session 2: Exploring AI Assurance, Reliability and Explainability. Speaker: Assoc Prof Toby Murray
12.30 – 1.30 pm	Lunch
1.30 – 2.20 pm	Session 3: Industry panel discussion - Technical, business, and risk factors organisations should consider to advance AI in a responsible, safe, and compliant manner. Panellists: Dr Liming Zhu (CSIRO), Nicola Smyth (Amazon Web Services), Janice Carey (Coles). Moderator: Prof Rahil Garnavi (RMIT)
2.20 - 3.00 pm	Session 4: Telix Pharmaceutical's AI Journey and Insights. Speaker: Dr Simon Wail: Director of AI Research
3.00 – 3.30 pm	Afternoon Tea
3.30 – 4.15 pm	Session 5: Australian Super's AI Journey and Insights. Speakers: Mike Backeberg, Chief Technology Officer and Dr Greg Hill, Head of Data Strategy, Analytics and Insights
4.15 – 5.00 pm	Session 6: Exploring approaches to developing trusted GenAI systems. Speaker: Prof Eduard Hovy, Executive Director – Melbourne Connect
5.00 pm	Close

Industry Day Program Speaker Biographies



Speaker: Jeannie Marie Paterson, Director, Centre for AI and Digital Ethics Professor, Melbourne Law School, The University of Melbourne

Jeannie is a Professor of Law and the Director of the Centre for AI and Digital Ethics at the University of Melbourne. Jeannie's teaching and research focuses on consumer and data protection law and ethics in the context of emerging digital technologies. Jeannie has a track record of consultation and collaboration with government, industry, regulators and community legal centres. She is currently a member of the Commonwealth Government's temporary AI expert panel. Jeannie is an affiliate researcher with the Melbourne Social Equity Institute and the Centre of Excellence for Automated Decision-Making and Society, as well as a Fellow of the Australian Academy of Law.



Speaker: Prof Toby Murray, Associate Professor, Faculty of Engineering and Information Technology The University of Melbourne

Toby's research focuses on how to build highly secure and reliable computer systems. His achievements include leading the cross-intuitive team that won the 2021 Eureka Prize for Outstanding Science in Safeguarding Australia, for their work designing, building, and proving secure the Cross Domain Desktop Compositor device for secure information access in Defence environments. He was also co-recipient of the 2022 ACM Software System Award for his work on the seL4 project, which is a foundation for building highly reliable systems, recognising its conceptual contributions and lasting industrial impact. He also regularly leads and contributes to government policy submissions on cyber security, digital privacy and artificial intelligence.



Dr Simon Wail, Director of AI Research at Telix Pharmaceuticals

Simon studied computer science at RMIT (Melbourne, Australia) and holds a Ph.D. in Computer Engineering (1992) from RMIT.

He has held various research and engineering roles in multiple companies over the years, including about 10 years in the US. The common thread in his career has been Healthcare and Lifesciences research with a particular focus on medical imaging. This has included representing companies on the DICOM medical imaging standards committee and the Integrating the Healthcare Environment (IHE) committee.

Upon returning to Australia, he joined IBM Research initially supporting the Victorian Lifesciences Computation Initiative and its researchers to utilise the cutting-edge supercomputers available for complex modelling, simulation and data analysis. He then moved into the medical imaging group as AI was starting its most recent resurgence. He led teams developing machine learning and deep learning based algorithms for image processing, primarily segmentation, and predictive analytics for precision medicine. Areas of research included melanoma detection, automatic cardiac functional analysis from MR imaging, and diabetic retinopathy and glaucoma detection from fundus imaging and OCT.

In mid-2021 he joined Telix Pharmaceuticals as the Director of AI Research and was provided carte blanche to define the AI direction for the company. In his time at Telix he has defined a comprehensive AI strategy across the product pipeline, collected and organised data, and initiated and executed multiple AI research projects for radiopharmaceuticals some of which are now displaying promise for clinical adoption.



Mike Backeberg, Chief Technology Officer, AustralianSuper

Mike joined AustralianSuper in March 2020 and is the Fund's Chief Technology Officer. Mike brings with him extensive experience in strategy and technology transformation across large enterprises. His expertise is within the financial services sector, and this includes large government agencies that have a role in the Superannuation industry.

Prior to joining AustralianSuper, Mike held the role of Director and Head of Emerging Technology (Oceania) for EY. Mike migrated to Australia in 2014 and prior to this ran his own software development company in South Africa, delivering large scale banking and financial solutions across Africa and the UK. He has delivered solutions in 16 different countries in his career.

Mike studied to be a lawyer holding a Bachelor of Arts and LLB degree, before transitioning to technology as a career. His post graduate qualifications include a Masters Degree in Applied Ethics with a specialisation in Information and Computer Ethics and an advanced project management qualification from Stanford University.



Gregory Hill, Head of Data Strategy, Analytics and Insights, AustralianSuper

Dr Gregory Hill is Head of Data Strategy, Analytics and Insights at AustralianSuper. He was previously Director at analytics consultancy Taylor Fry, Data & Analytics Lead (Commercial) at ANZ Bank and Global Head of Analytics at Brightstar. He is also Adjunct Faculty at Melbourne Business School, where he lectures in Data and Analytics Strategy. Dr Hill is a founding Member of the Centre for Business Analytics' Industry Advisory Board. He has led advanced analytics and data science teams since 2009, solving business problems across telco, retail and finance domains.



Eduard Hovy Executive Director, Melbourne Connect The University of Melbourne, Research Professor, Language Technologies Institute Carnegie Mellon University

Eduard is the Executive Director of Melbourne Connect, a research and tech transfer hub at the University of Melbourne, and a Professor in the University's School of Computing and Information Systems. He is also a research professor at Carnegie Mellon University's Language Technologies Institute.

Eduard's research primarily revolves around computational semantics and natural language processing, addressing machine reading, information extraction, text summarisation and more. He is an accomplished author who has published numerous technical articles and books. Eduard has served in several prestigious roles, including as President of the Association of Computational Linguistics and other international associations.

Industry Day Program Panelist Biographies



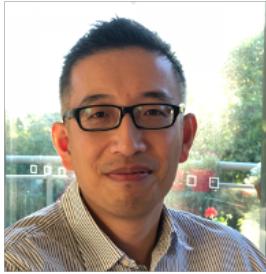
Rahil Garnavi, Professor and Director of the RMIT Artificial Intelligence Advanced Innovation Experience Hub

Rahil is the Director of the RAIsE Hub at RMIT University, where she leads efforts to bridge the gap between AI education, research, and industry. An internationally recognised AI thought leader, strategist, and IBM Master Inventor, Rahil has over 15 years of experience in AI research, development, and adoption. As a founding member of IBM Research Australia, she played a pivotal role in establishing its cutting-edge AI research facility, driving impactful innovation, setting strategic vision, and forging key partnerships that created value for both the business and its clients. Rahil holds more than 50 AI patents, over 60 publications, and was a finalist in prestigious awards such as the Women Leading Tech Award 2022 and the Women in AI Awards 2021 (Australia New Zealand). She is deeply committed to promoting the responsible development and adoption of AI, regularly speaking at industry panels on Responsible AI. Additionally, she is devoted to mentoring the next generation of AI talent and is an advocate for diversity in STEM.



Janice Carey, Head of Advanced Analytics and AI Technology, Coles

Janice joined Coles in 2023 heading up Advanced Analytics and Artificial Intelligence. She partners with C-suite leaders to help organisations work smarter and innovate in our fast-moving world. Janice has held a number of senior roles across Data Strategy, Data Science, Digital, Systems Integration, Outsourcing and Consulting across multiple sectors. Previous to Coles she has held leadership roles at Bupa, Monash University and IBM. During her early career Janice leveraged her engineering domain expertise to develop deep skills in technology enabled transformation, supply chain, Computer Aided Design and factory automation. Janice holds an MBA (Melb) and a Bachelor of Engineering (Monash).



Dr Liming Zhu, Research Director, CSIRO - Data61

Liming is a Research Director at CSIRO's Data61, the AI/digital arm of Australia's national science agency, and a conjoint professor at UNSW. He contributes to the OECD.AI's AI Risks and Accountability, the Responsible AI at Scale think tank at Australia's National AI Centre, ISO AI standards committees, and Australia's AI safety standard. His research division innovates in AI engineering, responsible/safe AI, blockchain, quantum software, privacy, and cybersecurity, and hosted Australia's Consumer Data Right/Open Banking standards setting. Dr Zhu has authored over 300 papers and is a regular keynote speaker. He delivered the keynote "Software Engineering as the Linchpin of Responsible AI" at the International Conference on Software Engineering. His latest book, "Responsible AI: Best Practices for Creating Trustworthy AI Systems," and his forthcoming book, "AI Engineering: Architecture and DevOps for AI Systems," reflect his vision for the rigorous engineering of responsible and safe AI systems for society.



Nicola Symth, Solution Architect, Amazon Web Services

Nicola is a Startup Solutions Architect at AWS, empowering startups across ANZ to build and scale innovative solutions. With expertise in cloud technologies and emerging trends across startups, Nicola helps founders and technical teams optimise their infrastructure and streamline operations. Nicola runs regular sessions for startups on utilising Amazon Bedrock, AWS's managed Generative AI service for builders looking to test out different prompt engineering techniques and understand how to easily integrate Gen AI in their own applications. She is passionate about helping startups unlock the full potential of AI to achieve rapid growth and become industry unicorns. Nicola holds a B.Sc. in Biotechnology and a Master of Management from the University of Melbourne, combining scientific insight with business acumen in her approach to startup solutions.

Thursday, 1100-1240: Session 3

3A

Room: Forum 3

Chair: Ziqi Xu

- *Revisiting Bagging for Stochastic Algorithms.* Caitlin A. Owen, Grant Dick, Peter A. Whigham.
- *Sampling of Large Probabilistic Graphical Models Using Arithmetic Circuits.* Sandeep Suresh, Barry Drake.
- *Importance-based Pruning for Genetic Programming based Symbolic Regression.* Rimas Mohamad, Qi Chen, Mengjie Zhang.
- *Quantifying Manifolds: Do the Manifolds Learned by Generative Adversarial Networks Converge to the Real Data Manifold?* Anupam Chaudhuri, Anj Simmons, Mohamed Abdelrazek.
- *Equality Generating Dependencies in Description Logics via Path Agreements.* Eva Feng, Enrico Franconi, Peter F. Patel-Schneider, David Toman, Grant Weddell.

3B

M01+M02

Chair: Vernon Asuncion

- *Graceful Task Adaptation with a Bi-Hemispheric RL Agent.* Grant Nicholas, Levin Kuhlmann, Gideon Kowadlo.
- *Towards Virtual Character Control via Partial Story Sifting.* Wilkins Leong, Julie Porteous, John Thangarajah.
- *Boosting Reinforcement Learning Algorithms in Continuous Robotic Reaching Tasks using Adaptive Potential Functions.* Yifei Chen, Lambert Schomaker, Francisco Cruz.
- *ECoDe: A Sample-Efficient Method for Co-Design of Robotic Agents.* Kishan Reddy Nagiredla, Arun Kumar A V, Buddhika Laknath Semage, Thommen Karimpanal George, Santu Rana.
- *Causally driven hierarchies for Feudal Multi-Agent Reinforcement Learning.* Priyam Dalmia, Joseph West.

Thursday, 1330-1500: Session 4

4A

Room: Forum 3

Chair: Caitlin Owen

- *Approximate Nearest Neighbour Search on Dynamic Datasets: An Investigation.* Ben Harwood, Amir Dezfouli, Iadine Chades, Conrad Sanderson.
- *Pathwise Gradient Variance Reduction with Control Variates in Variational Inference.* Kenyon Ng, Susan Wei.
- *Active Continual Learning: On Balancing Knowledge Retention and Learnability.* Thuy-Trang Vu, Shahram Khadivi, Mahsa Ghorbanali, Dinh Phung, Reza Haf.
- *Bayesian Parametric Proportional Hazards Regression with the Fused Lasso.* Enes Makalic, Daniel F. Schmidt.

4B

M01+M02

Chair: Artem Lensky

- *Online Deep Reinforcement Learning of Servo Control for a Small-Scale Bio-Inspired Wing.* Luc Stiemer, Mario Martinez, Louisa Wood, Abdulghani Mohammed, Timothy Wiley.
- *Posterior Tracking Algorithm for Multi-objective Classification Bandits.* Riku Suzuki, Atsuyoshi Nakamura.
- *Unsupervised dMRI Artifact Detection via Angular Resolution Enhancement and Cycle Consistency Learning.* Sheng Chen, Zihao Tang, Xinyi Wang, Chenyu Wang, Weidong Cai.
- *Assessment of Left Atrium Motion Deformation Through Full Cardiac Cycle.* Abdul Qayyum, Moona Mazher, Charles Sillett, Angela Lee, Jose A Solis-Lemus, Steven A Niederer, Imran Razzak.

Thursday, 1530-1700: Session 5

5A

Room: Forum 3

Chair: Timothy Wiley

- *Climate Downscaling Monthly Coastal Sea Surface Temperature Using Convolutional Neural Network and Composite Loss.* Chen Wang, Erik Behrens, Hui Ma, Gang Chen, Victoria Huang.

- *3DSSG-Cap: A Caption Enhanced Dataset for 3D Visual Grounding.* Yifan wang, Chaoyi Zhang, heng wang, Weidong Cai.

- *Multi-scale Cooperative Multimodal Transformers for Multimodal Sentiment Analysis in Videos.* Lianyang Ma, Yu Yao, Tao Liang, Tongliang Liu.

- *Chain of Thought Prompting in Vision-Language Model for Vision Reasoning Tasks.* Jianjiu Ou, Jianlong Zhou, Yifei Dong, Fang Chen.

5B

M01+M02

Chair: Hsu Myat Win

- *A Self-Adaptive Framework for Efficient Cell Detection and Segmentation in Histopathological Images with Minimal Expert Input.* Enqi Liu, Lin Zhang, Islam Alzoubi, Haneya Fuse, Manuel B. Graeber, Xiuying Wang.

- *Learning Low-Energy Consumption Obstacle Detection Models for the Blind.* Peijie Xu, Andy Song, Ke Wang.

- *Claimsformer: Pretrained Transformer for Administrative Claims Data to Predict Chronic Conditions.* Leah Gerard, Xueping Peng, Allison Clarke, Guodong Long.

- *Vision-Based Abnormal Action Dataset for Recognising Body Motion Disorders.* Jiaying Ying, Xin Shen, Xin Yu.

5C

M03

Chair: Guanjin Wang

- *Improving Intersectional Group Fairness Using Conditional Generative Adversarial Network and Transfer Learning.* David Quashigah Dzakpasu, Jixue Liu, Jiuyong Li, Lin Liu.

- *GPT-4 Attempting to Attack AI-Text Detectors.* Alshehri Nojoud, Yuhao Lin.

- *Charting a Fair Path: FaGGM Fairness-aware Generative Graphical Models.* Vivian Wei Jiang, Gustavo Enrique Batista, Michael Bain.

- *Shedding Light on Greenwashing: Explainable Machine Learning for Green Ad Detection.* Yihan Bao, Abdul Karim Obeid, Daniel Angus, Julian Bagnara, Christopher Leckie.

Friday, 0900-1000: Keynote Flora Salim

Title LLMs it (or not!): Foundational and robust approaches for modelling trajectory and spatio-temporal behaviours

Room: Forum 1+2

Chair: Yiliao Song



Abstract: Spatio-temporal data have been very instrumental for developing predictive models in various fields like energy, transport and mobility, retail, and public health management. The heterogeneity and dynamic nature of spatio-temporal data often require handcrafted feature transformations, making modeling more complex, and typically requires specific narrow modelling approach. Transformers offer solutions by enabling effective modeling of sequential behavior with minimal feature transformation. Further, modelling with spatiotemporal data is often hampered by the dynamic nature of the data and data sparsity.

LLM's common knowledge and semantic understanding offer new opportunities for addressing the inherent challenges from spatio-temporal data and trajectory learning tasks. We started exploring language-based modeling paradigm for modeling trajectory and spatio temporal behaviours since late 2021. To address data sparsity and lack of semantic information in common spatio-temporal data, we leverage LLMs to improve the generalizability and improve the performance, in zero-shot and fine-tuned settings. We have also introduced the first work on LLMs-based models for POI recommendation system.

But – do we really need LLMs for many spatio-temporal and trajectory learning tasks? This talk presents the use of LLMs in to enhance generalization and few-shot learning capability in tasks like mobility forecasting, point-of-interest recommendations, and energy load forecasting. This talk also discusses some approaches to deal with missing data, sporadic time-series, distribution shift, and emerging tasks.

Bio: Flora Salim is a Professor in the School of Computer Science and Engineering (CSE) and the inaugural Cisco Chair of Digital Transport & AI, University of New South Wales (UNSW) Sydney, and the Deputy Director (Engagement) of UNSW AI Institute. Her research is on generalisable and data-efficient machine learning for multimodal spatio-temporal learning tasks. She is a member of the Australian Research Council (ARC) College of Experts. She currently serves as an an Editor of IMWUT, Associate-Editor-in-Chief of IEEE Pervasive Computing, Associate Editor of ACM Transactions on Spatial Algorithms and Systems, a Steering Committee member of ACM UbiComp , and an Area Chair for many conferences including NeurIPS, ICLR, and The Web Conf (WWW). She has worked with many industry and government partners, and managed large-scale research and innovation projects, leading to several patents and deployed systems.

Friday, 1030-1230 Special Session on ethical, safe and inclusive AI

Room: Forum 1+2+3

Chairs: Yasmeen George and Chang Xu

The Special Session features four guest speakers and a panel discussion, each exploring key aspects of ethical, safe, and inclusive AI.

- 10:30am Jeannie Marie Paterson, The University of Melbourne. *Navigating the web of initiatives for AI standards and guardrails in Australia: why transparency matters for safe and inclusive AI.*
- 10:55am Anthony McCosker, Swinburne University of Technology. *Establishing an AI capabilities lab to address the problem of Inclusive AI.*
- 11:20am Rahil Garnavi, RMIT University. *How can ethical AI practices enhance trust and lead to a higher return on investment?*
- 11:45am Rita Arrigo, National AI Centre. *Inclusive and responsible AI: AI bias impact, challenges and ethical considerations.*
- 12:10 – 12:30pm *Panel: Defining Ethics and Bias in AI.* Moderator: Geoff Webb, Monash University.

Order of Presentations

Jeannie Paterson, The University of Melbourne: *Navigating the web of initiatives for AI standards and guardrails in Australia: why transparency matters for safe and inclusive AI:* While AI offers tremendous opportunities for Australian society, its risks and the threats it enables are also becoming more apparent. Significantly these risks include bias, exclusion and division. The Commonwealth Government has recently announced a suite of law reform initiatives affecting the development and deployment of AI in Australia. In this presentation, Jeannie considers why transparency is a necessary but not sufficient value in responding to risks of bias and promoting safe and inclusive AI.

Anthony McCosker, Swinburne University of Technology: *Establishing an AI capabilities lab to address the problem of Inclusive AI:* Attention to the development and application of responsible AI often overlooks the issue of inclusivity or subsumes it within notions of bias and dataset diversity. The establishment of inclusive AI practices and generative AI technologies is paramount to ensuring equitable and beneficial outcomes for all segments of society. This presentation elaborates on current approaches to inclusive AI and sets out some directions for research. It explores the foundational work of establishing an AI Capabilities Lab dedicated to building an evidence base and fostering inclusivity and innovation in AI development. The AI Capabilities Lab, developed as part of an ARC Centre of Excellence for Automated Decision Making and Society flagship project aims to bridge the gap between AI technologies and the diverse needs of our communities. By focusing on digital inclusion and the critical capabilities needed for inclusive AI, the lab seeks to address the challenges and opportunities presented by AI transformations. In addition to outlining the Lab's innovative methodology for studying AI capabilities 'in the wild', this paper explores (a) inclusive AI frameworks; (b) diversity, creativity and criticality in generative AI technologies; (c) community engagement and education methods; (d) the importance of collaborative research partnerships. Through these elements the AI Capabilities Lab aims to address both the opportunities and challenges posed by generative AI in society.

Rahil Garnavi, RMIT University: *How can ethical AI practices enhance trust and lead to a higher return on investment?* In an era where AI is becoming increasingly integral to business operations, understanding and implementing Responsible AI is crucial for both ethical integrity and financial success. This talk will cover the definition of Responsible AI, the principles behind AI governance, and practical

steps for integrating these practices into the organization. We'll explore how implementing ethical AI practices can significantly enhance trust and lead to a higher return on investment.

Rita Arrigo, National AI Centre: *Inclusive and responsible AI: AI bias impact, challenges and ethical considerations:* The integration of Artificial Intelligence (AI) into Australian businesses presents an exciting opportunity to enhance productivity and innovation. However, it also brings forth significant challenges, particularly concerning AI bias and ethical considerations. This talk will explore how fostering an environment that encourages the development and adoption of Responsible AI by delving into the recently launched voluntary AI Safety Standard. This standard aims to provide comprehensive guidance and best practices for businesses and individuals involved in AI development and usage. In this session you will gain insights into the opportunities and challenges associated with inclusive and responsible AI, and to understand the pivotal role Responsible AI in shaping the future of AI in Australia

Panel Moderator, Geoff Webb, Monash University: The panel will explore issues in regard to defining ethics and bias in AI .

Special Session Speaker Biographies

Jeannie Marie Paterson is a Professor of Consumer Protection and Technology Law and founding co-Director of the Centre for Artificial Intelligence and Digital Ethics at the University of Melbourne. Jeannie's research focuses on the regulatory and ethical challenges of misleading AI, including concerns around misrepresentation, misinformation and deep fake fraud. Jeannie is a Fellow of the Australian Academy of law and a member of the Commonwealth Governments Temporary AI Expert Advisory Group.



Anthony McCosker is Professor of Media and Communication at Swinburne University of Technology, Australia, Director of the Social Innovation Research Institute, and a Chief Investigator in the ARC Centre of Excellence for Automated Decision Making and Society. His research addresses digital inclusion and inequality in the adoption of new technology, with a focus on data capability and learning with AI. He works with public sector, health care and non- profit organisations to ensure equitable and innovative technology adoption. His latest co-authored books are Everyday Data Cultures (2022, Polity Press) and Automating Vision: The Social Impact of the New Camera Consciousness (2020, Routledge).



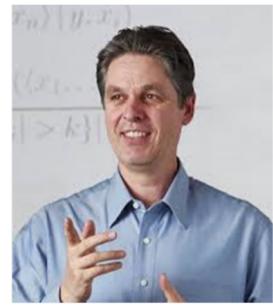
Professor Rahil Garnavi is the Director of the RAIsE Hub at RMIT University, where she leads efforts to bridge the gap between AI education, research, and industry. An internationally recognized AI thought leader, strategist, and IBM Master Inventor, Rahil has over 15 years of experience in AI research, development, and adoption. As a founding member of IBM Research Australia, she played a pivotal role in establishing its cutting-edge AI research facility, driving impactful innovation, setting strategic vision, and forging key partnerships that created value for both the business and its clients. Rahil holds more than 50 AI patents, over 60 publications, and was a finalist in prestigious awards such as the Women Leading Tech Award 2022 and the Women in AI Awards 2021 (Australia New Zealand). She is deeply committed to promoting the responsible development and adoption of AI, regularly speaking at industry panels on Responsible AI. Additionally, she is devoted to mentoring the next generation of AI talent and is an advocate for diversity in STEM.



Rita Arrigo is the Strategic Engagement Manager at National AI Centre, focused on leading the AI ecosystem strategy to foster engagement and collaboration across AI to lift Australia's global AI adoption and growing a responsible AI Industry in Australia. She has delivered thought leadership from Generative AI, AI in Cyber Security and AI for Climate Tech and has launched AI Industry Connection a forum to connect companies interested in emerging AI with the cutting-edge research and the AI Industry. As a renowned digital & AI strategist she cultivates innovation with emerging technologies including Artificial Intelligence (AI), Generative AI, Machine Learning (ML), Mixed Reality (MR). Previously Chief Digital Advisor at Microsoft. She was appointed an AI Ambassador and continues to advocate for ways that AI and XR can build better futures for our work and communities.



Professor Geoff Webb of the Monash University Department of Data Science and Artificial Intelligence is an eminent and highly-cited data scientist. He was editor in chief of the Data Mining and Knowledge Discovery journal, from 2005 to 2014. He has been Program Committee Chair of both ACM SIGKDD and IEEE ICDM, as well as General Chair of ICDM and member of the ACM SIGKDD Executive. He is a Technical Advisor to machine learning as a service startup BigML Inc and to recommender systems startup FROOMLE. He developed many of the key mechanisms of support-confidence association discovery in the 1980s. His OPUS search algorithm remains the state-of-the-art in rule search. He pioneered multiple research areas as diverse as black-box user modelling, interactive data analytics and statistically-sound pattern discovery. He has developed many useful machine learning algorithms that are widely deployed. His many awards include IEEE Fellow, the inaugural Eureka Prize for Excellence in Data Science (2017), the Pacific-Asia Conference on Knowledge Discovery and Data Mining Distinguished Research Contributions Award (2022) and the IEEE International Conference on Data Mining 10-year Highest Impact Award (2023). He has thrice been recognised by The Australian Research Magazine as Australia's leading Bioinformatics and Computational Biology researcher.



Friday, 1330-1450: Session 6

6A

Forum 1+2

Chair: Lia Song

- *Ensuring Fairness in Stochastic Multi-Armed Bandit Problems for Effective Group Recommendations.* Rei Ozaki, Atsuyoshi Nakamura.

- *Human Decision-Making Concepts with Goal-Oriented Reasoning for Explainable Deep Reinforcement Learning.* Chris Lee, Francisco Cruz, Eduardo Sandoval.

- *Towards Explainable Deep Learning for Non-melanoma Skin Cancer Diagnosis.* Van Anh Le, Andy Song, Karin Verspoor.

- *Beyond Factualism: A Study of LLM Calibration through the Lens of Conversational Emotion Recognition.* Samad Roohi, Richard Skarbez, Hien Duy Nguyen.

6B

Forum 3

Chair: Abdul Qayyum

- *Online Machine Learning for Real-Time Cell Culture Process Monitoring.* Thanh Tung Khuat, Robert Bassett, Ellen Otte, Bogdan Gabrys.

- *Motif-induced Subgraph Generative Learning for Explainable Neurological Disorder Detection.* Mujie Liu, Qichao Dong, Chenze Wang, Xinrui Cheng, Falih Febrinanto, Azadeh Noori Hoshyar, Feng Xia.

- *Multimodal Hyperbolic Graph Learning for Alzheimer's Disease Detection.* Chengyao Xie, Wenhao Zhou, Ciyan Peng, Azadeh Noori Hoshyar, Chengpei Xu, Usman Naseem, Feng Xia.

- *Real-Time Human Activity Recognition Using Non-Intrusive Sensing and Continual Learning.* Md Geaur Rahman, Sabih ur Rehman, Shanna Fealy, Johan Sebastian Ramirez Vallejo, Aayush Fuskelay, Mohammad Ali Moni.

1C

M01+M02

Chair: Mingming Gong

- *Enabling Visual Intelligence by Leveraging Visual Object States in a Neurosymbolic Framework.* Filippos Gouidis, Konstantinos Papoutsakis, Theodore Patkos, Antonis Argyros, Dimitris Plexousakis.

- *End-to-end Truck Speed Detection using Deep Multi-Task Learning.* Zuo Huang, Richard Sinnott, Krista A. Ehinger.

- *Real-Time Lightweight 3D Hand-Object Pose Estimation Using Temporal Graph Convolution Networks.* Yue Yin, Chris McCarthy, Dana Rezazadegan.

- *New Perspectives for the Deep Learning Based Photography Aesthetics Assessment.* Vernon Asuncion, Yan Zhang.

General Information

Name Badges

Please wear your name tag at all conference events, including the banquet and reception. Catering staff will be instructed to decline to provide food and beverages if they cannot see a name tag.

Morning tea, afternoon tea and lunch breaks

For events at RMIT, these breaks will be held outside the conference rooms on level 3.

For events at Melbourne Connect, these will be held at the Launchpad (mezzanine level) Melbourne Connect. The launchpad is tucked behind the door next to the lifts (see map at end of booklet).

Reception

A reception for the main conference will be held late Wednesday afternoon at the Launchpad (mezzanine level) Melbourne Connect. The launchpad is tucked behind the door next to the lifts.

Conference Dinner and Award Ceremony

Those registered for the 3 day or 5 day conference will receive a conference dinner ticket when they collect their registration badge. Please bring this ticket to the conference dinner with you.

The conference dinner will be held on Thursday 28th November, 1830-2200, at the Ballroom of the Sheraton Hotel, 27 Little Collins Street. The hotel is a 2.1km walk from Melbourne Connect (20min-30min). Alternatively, one can take a tram from Melbourne Connect, along Swanston St to Collins St and from there take a short walk to the hotel.

Taking public transport in Melbourne requires a myki. Mykis need to be purchased in advance. They can be purchased from 7-11 stores (there is one opposite Melbourne Connect), or at the tram stop near Melbourne Connect.

Internet Access

RMIT University provides a free wireless internet service that will be available to all conference attendees. Please use the WIFI Network: RMIT Guest and Conference Code: 600084.

Melbourne Connect: Please use the Public WIFI Network: MelbConnectGuest - no password required.

Disclaimers

Program: The Conference Schedule was correct at time of printing. The Conference Organizing Committee reserves the right to change the Conference program at any time without notice.

Security: Please ensure that you take all items of value with you at all times when leaving a room. Do not leave bags or laptop computers unattended.

Liability/Insurance: In the event of industrial disruptions or natural disasters, the host, RMIT University, Melbourne Connect and the Organizing Committee cannot accept responsibility for any financial or other losses incurred by the delegates; nor can they take any responsibility for injury or damage to persons or property occurring during the Conference. All insurance, including medical cover or expenses incurred in the event of the cancellation of the Conference is the individual delegate's responsibility. Attendees are encouraged to choose a travel insurance policy that included loss of fees/deposits through cancellation of your participation in the Conference, or through the cancellation of the Conference itself, loss of airfares for any reason, medical expended, loss or damage to personal property, additional expenses and repatriation should travel arrangements have to be altered. The Conference Secretariat will take no responsibility for any participant failing to insure.

Venue Map - Melbourne Connect



THE LAUNCH PAD

THE LAB

The Melbourne Connect Superfloor is designed to connect co-located partners and the broader innovation community. At the centre of the precinct, it comes to life through its dynamic program of events, activations and workshops.

Featuring a wide open space overlooking the Womin-Djerring (Oculus), this is the beating heart of Melbourne Connect, with arteries branching out into the varied event and meeting spaces, which are available to hire.

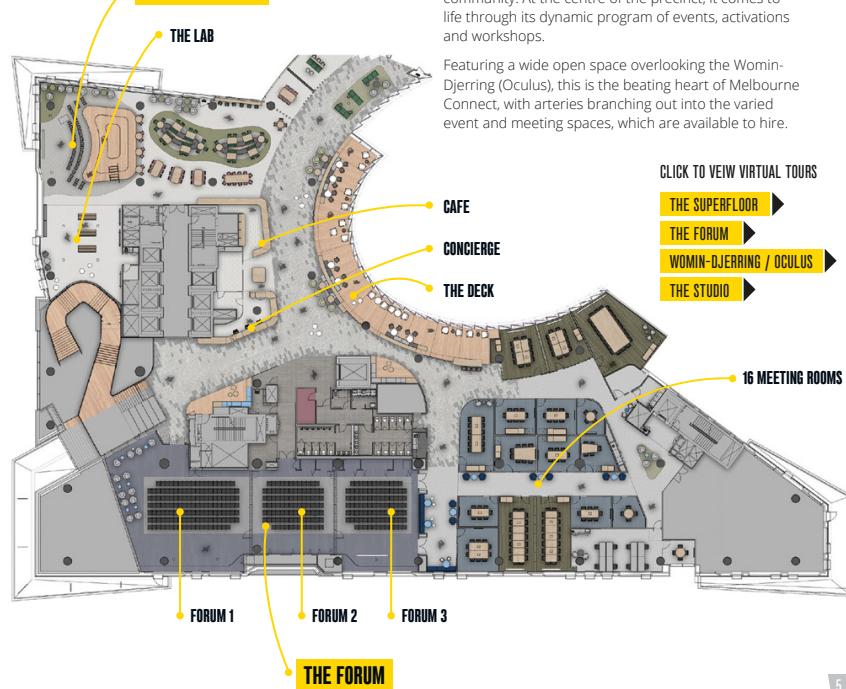
CLICK TO VIEW VIRTUAL TOURS

[THE SUPERFLOOR ►](#)

[THE FORUM ►](#)

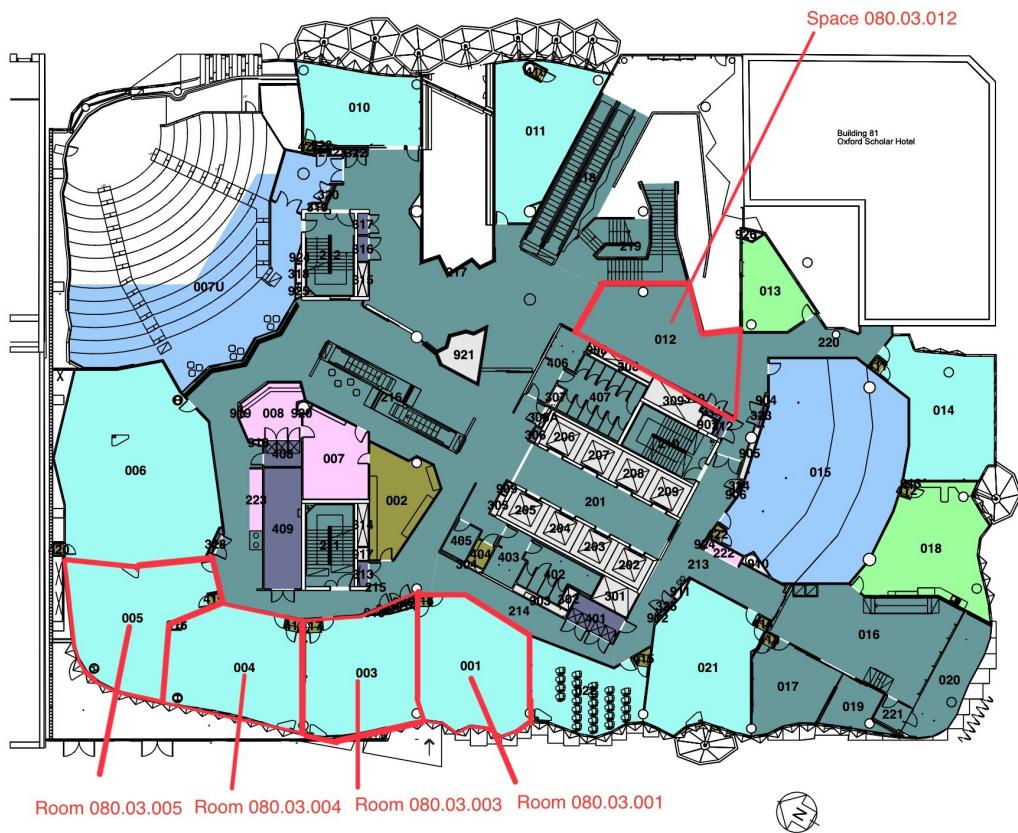
[WOMIN-DJERRING / OCULUS ►](#)

[THE STUDIO ►](#)



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Venue Map - RMIT Building 80 Level 3



Venue Map - RMIT Building 80 Level 9

