

2024 1st International Conference on Advanced Robotics, Control, and Artificial Intelligence (ARCAI 2024)

9 - 12 December 2024
Perth, Australia

Conference Program



 **ARCAI 2024**

PERTH, AUSTRALIA DEC. 9-12, 2024

 **Murdoch
University**

Organised by

Murdoch University, Perth, Australia

WELCOME FROM GENERAL CHAIR

Welcome to ARCAI 2024!

Dear Esteemed Delegates and Friends,

We are thrilled to welcome all you to the 2024 1st International Conference on Advanced Robotics, Control, and Artificial Intelligence (ARCAI 2024), held on 9-12 December, 2024, in the beautiful and dynamic city of Perth, Australia. We are honoured to have you here for this historic and milestone event.



Perth, the capital city of Western Australia, is a vibrant and dynamic metropolis nestled along the banks of the Swan River. Renowned for its stunning natural beauty, Perth features a picturesque skyline framed by the Indian Ocean to the west and the Darling Scarp to the east. The city's economy is significantly bolstered by its pivotal role in Australia's mining and resources industries, with the mining sector contributing substantially to its economic output. Perth's blend of educational excellence, cutting-edge research, and a dynamic industrial landscape makes it a forward-looking city, offering a fantastic experience for our conference attendees.

As we approach to the end of 2024, ARCAI 2024 marks a great significance of milestone for the birth of International Conference on ARCAI. As the first conference, it provides the international premier forum for leading academic scientists, researchers and engineers to exchange and present latest research developments and outcomes on all aspects of robotics, control and artificial intelligence. Particularly, it not only welcomes those emerging methodologies and techniques which bridge theoretical studies and applications in all robotics and control systems as well as artificial intelligence, but also includes the practical concerns and challenges encountered and potential solutions in those fields.

Our program is carefully designed for researchers and engineers to exchange knowledge and ideas on the recent developments of robotics, control and artificial intelligence. We are also privileged to have 6 distinguished keynote speakers, 4 industry forums, and 2 tutorial talks.

This year, ARCAI 2024 received nearly 180 paper and abstract submissions, involving over 800 co-authors from various countries worldwide. Each submission was peer-reviewed by at least two experts in the respective fields, with acceptance decisions based on a minimum of two consistent recommendations, ensuring the quality and standards of the

Conference. Ultimately, 126 papers and abstracts were accepted for presentation in the Conference, which are organized and will be presented in 18 oral sessions.

We extend our heartfelt thanks to the organizing and technical committees, reviewers and our sponsors. Their unwavering support and dedication have been instrumental in making this conference a success.

We look forward to a productive and memorable event and to celebrating ARCAI 2024, the 1st International Conference on ARCAI with you. We wish you a very enjoyable time in Perth.

Kind regards,

Hai Wang

General Chair, ARCAI 2024

ARCAI 2024 ORGANIZING COMMITTEE

Advisory Chairs:

Xinghuo Yu

Royal Melbourne Institute of Technology University,
Australia

Yang Shi

University of Victoria, Canada

Changyun Wen

Nanyang Technological University, Singapore

Zhihong Man

Swinburne University of Technology, Australia

Paolo Montuschi

Polytechnic University of Turin, Italy

Manu Malek

Stevens Institute of Technology, USA

Giuseppe Carbone

University of Calabria, Italy

Shihua Li

Southeast University, China

General Chair:

Hai Wang

Murdoch University, Australia

General co-Chairs:

Amirmehdi Yazdani

Murdoch University, Australia

Bin Xu

Northwestern Polytechnical University, China

Shuping He

Anhui University, China

Liqing Chen

Anhui Agricultural University, China

Shihong Ding

Jiangsu University, China

Technical Program Chairs:

Jinchuan Zheng

Swinburne University of Technology, Australia

Xiangyu Wang

Southeast University, China

Tianhong Pan

Anhui University, China

Mingyao Ma

Hefei University of Technology, China

Shiyuan Han

Shandong Women's University, China

Finance Chairs:

Farhad Shahnia

Murdoch University, Australia

Tao Hu

Tao Education Australia, Australia

Special Session Chairs:

Baolin Zhang

Qingdao University of Science and
Technology, China

Zhaowu Ping

Hefei University of Technology, China

Liang Zhao

University of Technology Sydney, Australia

Yongquan Zhang

Zhejiang University of Finance and
Economics, China

Jiong Jin

Swinburne University of Technology,
Australia

Yongping Pan

Sun Yat-sen University, China

Publicity & Exhibition Chairs:

Herbert Ho-Ching lu

The University of Western Australia,
Australia

Zhenghua Zhou

Zhejiang University of Finance and
Economics, China

Jianlong Qiu

Linyi University, China

Yueying Wang

Shanghai University, China

Jinlin Sun

Jiangsu University, China

Publication Chairs:

Xiaoli Luan

Jiangnan University, China

Chenguang Yang

University of Liverpool, UK

Jianwei Zhao

China Jiliang University, China

Huaping Liu

Tsinghua University, China

Shuai Li

University of Oulu, Finland

Keli Hu

Shaoxing University, China

Registration Chairs:

Meng Zhang

Xi'an Jiaotong University, China

Amin Mahmoudi

Flinders University, Australia

Sheikh Azid

Murdoch University, Australia

Zhe Sun

Zhejiang University of Technology, China

Ke Shao

Northwestern Polytechnical University, China

Ming Yu

Hefei University of Technology, China

Best Paper Award Chairs:**Xiaozheng Jin**

Qilu University of Technology, China

Keqi Mei

Jiangsu University, China

Zhiguo Yan

Qilu University of Technology, China

Chi-Tsun Cheng

Royal Melbourne Institute of Technology University, Australia

Edi Kurniawan

National Research and Innovation Agency, Indonesia

Students Activity Chairs:**Shuiqing Xu**

Hefei University of Technology, China

Long Chen

Hangzhou Dianzi University, China

Honglei Xu

Curtin University, Australia

Gwanggil Jeon

Incheon National University, Korea

Industrial Liaison Chairs:**Jayaram Sivaramakrishnan**

Technip Energies, Australia

Moayed Moghbel

Alinta Energy, Australia

En Fan,

Shaoxing University, China

Jun Zhang

AIZONE, Australia

Tutorial Chairs:**Jian Wu**

Anqing Normal University, China

Yang Yang

Anhui Agricultural University, China

Wenjie Ye

Victoria University, Australia

Dazhong Ma

Northeastern University, China

Gaofeng Zhang

Hefei University of Technology, China

Conference Secretaries:**En Fan**

Shaoxing University, China

Zhuopeng Yang

Murdoch University, Australia

Nashit Sandhu

Murdoch University, Australia

Weiming Liu

Murdoch University, Australia

Nuo Chen

Murdoch University, Australia

Yiwei Xu

Murdoch University, Australia

Junqi Gong

Murdoch University, Australia

Shiron Anto Melvin

Murdoch University, Australia

Adam Stevenson

Murdoch University, Australia



ARCAI 2024 Program Overview

	9 Dec	10 Dec	11 Dec	12 Dec	13 Dec
08:00 - 08:30					Day Visit (Departure: 09:30, B Shed Fremantle) Return: 18:30, Rottneest Island)
08:30 - 09:00					
09:00 - 09:30		Opening Ceremony			
09:30 - 10:00		Keynote Speech-1	Keynote Speech-3	Keynote Speech-5	
10:00 - 10:30					
10:30 - 11:00		Coffee Break	Coffee Break	Coffee Break	
11:00 - 11:30					
11:30 - 12:00		Keynote Speech-2	Keynote Speech-4	Keynote Speech-6	
12:00 - 12:30					
12:30 - 13:00	Lunch	Lunch	Lunch		
13:00 - 13:30					
13:30 - 14:00	Tutorials 1, 2	Oral Sessions 1, 2, 3 Industry Forum-1	Oral Sessions 7, 8, 9 Industry Forum-3	Oral Sessions 13, 14, 15	
14:00 - 14:30					
14:30 - 15:00					
15:00 - 15:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
15:30 - 16:00	Tutorials 1, 2	Oral Sessions 4, 5, 6 Industry Forum-2	Oral Sessions 10, 11, 12 Industry Forum-4	Oral Sessions 16, 17, 18	
16:00 - 16:30					
16:30 - 17:15					
17:15 - 17:30					
17:30 - 18:00			Buses Departing to Dinner Venue	Closing Ceremony	
18:00 - 18:30	Welcome Reception				
18:30 - 19:00					
19:00 - 19:30			Conference Gala Dinner		
19:30 - 20:00					
20:00 - 20:30					
20:30 - 21:00			(Fraser's Restaurant, Kings Park)		
21:00 - 21:30					
21:30 - 22:00			Buses Departing to Hotel		

* **Registration desk is open all day during the event.**

** **Internet** is available at the Conference Venue via the below username/password:

Username: Murdoch_Conference_Guests

Password: WelcomeToMurdoch

AGENDA

MONDAY, 9 Dec		
TIME	ACTIVITY	VENUE
13:30 - 17:30	Tutorials	
	Tutorial 1: Multi-agent AI Systems in Real-time Communication through Speech <i>Presenter: Anupiya Nugaliyadde, Norwood Systems, Australia</i>	360.4.021
	Tutorial 2: Analysis and Synthesis of Run-to-Run Control for Semiconductor Manufacturing Process <i>Presenter: Tianhong Pan, Anhui University, China</i>	360.4.021
18:00 - 20:00	Welcome Reception	360.4 Foyer

Multi-agent AI Systems in Real-time Communication through Speech

Abstract: Multi-agent AI systems represent a significant advancement in real-time decision-making and problem-solving capabilities. We present a novel framework for coordinating multiple specialized AI agents that collaborate, communicate, and adapt dynamically to achieve complex tasks in real-time environments. Our approach implements a hierarchical architecture where agents with distinct expertise—ranging from data analysis to decision execution—work in parallel while maintaining synchronization through a central orchestration mechanism. The system demonstrates remarkable flexibility in handling diverse scenarios, from financial fraud detection to emergency response coordination, with response times averaging under 100 milliseconds. The framework's built-in redundancy and load-balancing capabilities ensure robust performance even under high-stress conditions. This approach contributes to the growing field of distributed AI systems by providing a scalable, reliable architecture for real-time multi-agent collaboration.



Anupiya Nugaliyadde is the Head of AI at Norwood Systems and an Honorary Research Fellow at Murdoch University. He focuses on real-time AI solutions with minimal resources, Novel AI solutions and Explainable AI. Having worked on many AI projects in multiple areas Anupiya has had the unique opportunity to research and develop some of the more complex machine learning and AI techniques, resulting in many products into the market and published research papers. Some of his papers introduced novel approaches for applying Deep Learning in the areas of Natural Language Understanding, Time Series, Image Processing, and Data Analysis.

Norwood Systems focus on building speech based real-time AI solutions ranging from translation to fraudulent call detection.

Our mission is to deliver disruptive end-user communication applications that streamline and simplify access to intuitive, powerful, and affordable telecommunications services – anywhere, anytime.

Tutorial - 2

Analysis and Synthesis of Run-to-Run Control for Semiconductor Manufacturing Process

Abstract: The semiconductor wafer manufacturing process is a typical batch process with multiple variables and a wide range of operating conditions. With the development of manufacturing technology, higher requirements have been put forward for the utilization of equipment. Therefore, the same machine often simultaneously fabricates wafers with different specifications, and products with the same specification may appear on different machines, i.e., mixed product processes. The research on this process control problem has also received many scholars' attention. In the past three decades, the Run-to-Run (R2R) control theory has made significant development. This report summarizes and analyzes several important strategies such as JADE, ANOVA, G&P-EWMA, d-EWMA collaborative design, ESO-EWMA, and DRL-EWMA from the perspective of optimized control, disturbance state estimation and measurement delay compensation in high-mixed product processes.



Tianhong Pan received the B.S. degree from Anhui Agriculture University, Hefei, China, the M.S. degree from Gansu University of Technology, Lanzhou, China, in 1997 and 2000, respectively, and the Ph.D. degree in control theory and control engineering from Shanghai Jiao Tong University, Shanghai, China, in 2007. Then, he worked 1.5 years for National Tsinghua University, Taiwan, China, and 3.5 years for University of Alberta, Canada, as a postdoctoral fellow. Currently, he is a full professor with the school of Electrical Engineering and Automation, Anhui University, Hefei, China. He has published more than 100 papers in the international journals and conferences. His research

interests include multiple model approach and its application, machine learning, virtual metrology, predictive control, and run-to-run control theory and practice.

AGENDA

TUESDAY, 10 DEC

TIME	ACTIVITY	VENUE
08:30 - 17:30	Registration	360.4 Foyer
09:00 - 09:30	Opening Ceremony	360.4.031
09:30 - 10:30	Keynote Speech 1	360.4.031
10:30 - 11:00	Coffee Break	360.4 Foyer
11:00 - 12:00	Keynote Speech 2	360.4.031
12:00 - 13:30	Lunch	
	Oral Presentations 1, 2, 3 Industry Forum 1	
13:30 - 15:00	Special Session on Data Science, AI Applications, and Safe & Security for Large Scale and Complex Systems	360.4.020
	Artificial Intelligence-I	360.4.021
	Artificial Intelligence-II	360.4.022
	Industry Forum 1 on AI and Cybersecurity	360.4.031
15:00 - 15:30	Coffee Break	
	Oral Presentations 4, 5, 6 Industry Forum 2	
15:30 - 17:15	Robotics-I	360.4.020
	Robotics-II	360.4.021
	Special Session on Advances in Unmanned Systems	360.4.022
	Industry Forum 2 on AI and Digital Twins with Applications	360.4.031

Keynote Speech 1



Ying Tan

Professor, The University of Melbourne, Australia
IEEE Fellow

Learning Control and Its Application in Rehabilitation Robotics

Abstract: Rehabilitation robotics leverages the principle of "practice makes perfect" by using repetitive task-based exercises to facilitate motor re-learning and functional recovery, particularly in post-stroke rehabilitation. Rooted in neurocognitive rehabilitation theories, robot-assisted therapies provide tailored, intensive training routines that meet individual patient needs. Learning control (LC) strategies, originally developed in 1978 to achieve high tracking performance in industrial applications, offer a compelling framework for controller designs in this field. Unlike traditional control methods, LC algorithms improve performance over time by utilizing information from previous iterations. This talk highlights recent advances in LC designs and illustrates how various LC algorithms effectively address the unique challenges posed by rehabilitation robotics. Additionally, it explores future opportunities for integrating learning control into rehabilitation systems and outlines key research questions for advancing control theory in this critical area.

Bio: Dr. Ying Tan is a Professor in Mechanical Engineering at The University of Melbourne, Australia. She earned her bachelor's degree from Tianjin University, China, in 1995, and her PhD from the National University of Singapore in 2002. After a postdoctoral fellowship at McMaster University, she joined The University of Melbourne in 2004. Dr. Tan has received prestigious recognitions, including an Australian Postdoctoral Fellowship (2006-2008) and an ARC Future Fellowship (2009-2013). Currently, she serves on the ARC College of Experts (2024-2026) and holds several distinguished titles, including Fellow of IEEE (FIEEE), Engineers Australia (FIEAust), and the Asia-Pacific Artificial Intelligence Association. She is also a member of the IEEE Fellow Committee (2024-2025). Her research spans intelligent systems, nonlinear systems, data-driven optimization, rehabilitation robotics, human motor learning, wearable sensors, and model-guided machine learning.

Keynote Speech 2



John Vial

Project Execution Lead at Nexxis, Perth, Australia

Robotics Research & Industrial Innovation: How to Find and Work with Industry Partners

Abstract: From the perspective of researchers, industry partners just look like big bags of money, its easy to think: "Surely they will want to support important my research? Imagine the new products they will make from it?" In this talk I'll describe my experience from the other side of the table. How industrial partners think about innovation, the kinds of drivers that they face, and what you should do if you want to build a long lasting, trusted business partnership. Along the way we will also look at current robotics trends, such as humanoid robots and what they could mean for industry partnerships going forward.

Bio: John Vial is a seasoned expert in robotics and machine learning, dedicated to the practical application of these transformative technologies. As the Project Execution Lead at Nexxis, John is at the forefront of developing advanced legged, magnetic inspection robots. His technical leadership spans across roles, including major AI initiatives at Fortescue Metals Group, where he was integral to the conception of an autonomous light vehicle project among other innovative solutions. John holds a PhD in Robotics from ACFR at Sydney University.

Oral Presentations

13:30-15:00 | TUESDAY, 10 DEC

Special Session on Data Science, AI Applications, and Safe & Security for Large Scale and Complex Systems

Chairs: Zheren Zhu, Weiming Shao

Venue: Room 360.4.020

Time	Paper ID	Title & Authors
13:30 - 13:45	146	Uni-Attack: A Unified Framework for Black-box Adversarial Attacks against LVLMS in Autonomous Driving <i>Hongda Chen (Xi'an Jiaotong University, China)</i> <i>Rui Zhang (China Three Gorges Corporation, China)</i> <i>Baogen Xu (Zhejiang University of Finance and Economics, China)</i> <i>Yongquan Zhang (Zhejiang University of Finance and Economics, China)</i>
13:45 - 14:00	156	Motor Imagery EEG Identification Using Kernel-ridge-regression-based Inductive Transfer Learning <i>Zhibin Jiang (Shaoxing University, China)</i> <i>Ning Zhang (Shaoxing University, China)</i> <i>Guanghai Chen (Yixing Traditional Chinese Medicine Hospital, China)</i> <i>Donghua Yu (Shaoxing University, China)</i> <i>Jie Zhou (Shaoxing University, China)</i>
14:00 - 14:15	24	Safety Criteria for Nonlinear Dynamical Systems under Continuously Dynamical Safe-state Set <i>Zheren Zhu (Hangzhou Normal University, China)</i> <i>Le Yao (Hangzhou Normal University, China)</i> <i>Xinmin Zhang (Zhejiang University, China)</i> <i>Yi Chai (Chongqing University, China)</i> <i>Zhihuan Song (Zhejiang University, China)</i>
14:15 - 14:30	71	DC Charging Pile Fault Diagnosis based on TCN-ISSA-BiLSTM <i>Li Feng (Chongqing Jiaotong University, China)</i> <i>Ziyi Lv (Chongqing Jiaotong University, China)</i> <i>Xu Shuiqing (Hefei University of Technology, China)</i> <i>Zhu Yuhuan (Chongqing Jiaotong University, China)</i> <i>Li Longfei (Chongqing Jiaotong University, China)</i>
14:30 - 14:45	89	Cloud-edge Collaborative Gaussian Mixture Model for Quality Prediction of Large-scale Industrial Processes <i>Le Yao (Hangzhou Normal University, China)</i> <i>Zheren Zhu (Hangzhou Normal University, China)</i> <i>Bingbing Shen (Hangzhou Normal University, China)</i> <i>Zeyu Yang (Huzhou University, China)</i> <i>Xiaoyu Jiang (Zhejiang University, China)</i>
14:45 - 15:00	104	A Semi-supervised Robust Linear Dynamical System for Industrial Quality Variable Prediction <i>Wenxue Han (China University of Petroleum, China)</i> <i>Weiming Shao (China University of Petroleum, China)</i> <i>Chihang Wei (Hangzhou Normal University, China)</i>

Artificial Intelligence-I**Chairs: Shu Sun, Adam Stevenson****Venue: 360.4.021**

Time	Paper ID	Title & Authors
13:30 - 13:45	94	Privacy-preserving Multi-period Traffic Prediction Model <i>Shu Sun (Zhejiang University, China)</i> <i>Zheren Zhu (Hangzhou Normal University, China)</i> <i>Xinmin Zhang (Zhejiang University, China)</i> <i>Zhihuan Song (Zhejiang University, China)</i> <i>Baiyi Luan (Jinan Foreign Language School, China)</i> <i>Sen Bao (Avalance Oy, China)</i>
		Unsupervised Domain Adaptation Regression for Soft Sensor Modeling in Blast Furnace Ironmaking <i>Qing Ding (Zhejiang University, China)</i> <i>BocunHe (Zhejiang University, China)</i> <i>Xinmin Zhang (Zhejiang University, China)</i> <i>Zheren Zhu (Zhejiang University, China)</i> <i>Zhihuan Song (Zhejiang University, China)</i> <i>Shu Sun (Zhejiang University, China)</i>
14:00 - 14:15	174	Comparison of Deep-learning Computer Vision Models for Crop Disease Species Classification and Crop Disease Severity Classification <i>Adam Stevenson (Murdoch University, Australia)</i> <i>Hai Wang (Murdoch University, Australia)</i> <i>Amirmehdi Yazdani (Murdoch University, Australia)</i>
14:15 - 14:30	176	Towards Energy-efficient Adaptive Deep Reinforcement Learning for Real-time IoT Systems: Bridging the Gap between Intelligence and Efficiency <i>Abdul Rashid Mumin (Zamzam University of Science and Technology Somalia, Somali)</i>
14:30 - 14:45	177	Improving Bidirectional RRT Path Planning with Target-oriented Sampling and Cubic Curve Smoothing <i>Zhuopeng Yang (Murdoch University, Australia)</i> <i>Hai Wang (Murdoch University, Australia)</i> <i>Amirmehdi Yazdani (Murdoch University, Australia)</i>
14:45 - 15:00	178	LiDAR Enhanced Monte Carlo Localization for Greenhouse Robot Using Deep Learning <i>Shiron Melvin (Murdoch University, Australia)</i> <i>Hai Wang (Murdoch University, Australia)</i> <i>Amirmehdi Yazdani (Murdoch University, Australia)</i>

Artificial Intelligence-II**Chairs: Li Xie, Utkal Mehta****Venue: 360.4.022**

Time	Paper ID	Title & Authors
13:30 - 13:45	144	Rapid Detection Method of Conjunctiva Quality of Yuba based on Improved YOLOv5s Model <i>Liangyuan Xu (Anhui Agricultural University, China)</i> <i>Kai Kang (Anhui Agricultural University, China)</i> <i>Yanhu Tao (Anhui Agricultural University, China)</i> <i>Qing Jiang (Anhui Agricultural University, China)</i> <i>Qiansheng Tang (Anhui Agricultural University, China)</i>
		A Lightweight Self-distillation Network for Cervical Cell Classification <i>Junjie Geng (Jiangnan University, China)</i> <i>Qian Lan (Jiangnan University, China)</i> <i>Weiping Shu (Jiangnan University, China)</i>

		<i>Li Xie (Jiangnan University, China)</i> <i>Huizhong Yang (Jiangnan University, China)</i>
14:00 - 14:15	164	Innovative Prostate Cancer Classification: Merging Autoencoders, PCA, SHAP, and Machine Learning Techniques <i>Anil Gavade (KLS Gogte Institute of Technology, India)</i> <i>Rajendra Nerli (JN Medical College, India)</i> <i>Priyanka Gavade (KLE Technological University, India)</i> <i>Meshach Kumar (University of the South Pacific, Fiji)</i> <i>Utkal Mehta (University of South Pacific, Fiji)</i>
14:15 - 14:30	58	A Lightweight Dual-dimensional Interactive Parallax Attention Network for Stereo Image Super-resolution <i>Wenjie Wang (China Jiliang University, China)</i> <i>Jianwei Zhao (China Jiliang University, China)</i> <i>Peijun Zheng (China Jiliang University, China)</i> <i>Zhenghua Zhou (Zhejiang University of Finance and Economics, China)</i> <i>Hai Wang (Murdoch University, Australia)</i>
14:30 - 14:45	59	Multi-contrast Enhanced Lightweight Diffusion Models for MRI Super-resolution <i>Tao Hong (China Jiliang University, China)</i> <i>Jianwei Zhao (China Jiliang University, China)</i> <i>Hao Qi (China Jiliang University, China)</i> <i>Zhenghua Zhou (Zhejiang University of Finance and Economics, China)</i> <i>Hai Wang (Murdoch University, Australia)</i>
14:45 - 15:00	106	UAV Video Combined with Deep Learning for Maize Seedling Counting and Distance Estimation <i>Lichao Liu (Anhui Agricultural University, China)</i> <i>Quan Zheng (Anhui Agricultural University, China)</i>
15:00 - 15:15	173	Processing of PRISMA hyperspectral remote sensing satellite data for alteration mineral mapping in dry valleys, South Victoria Land, Antarctica <i>Amin Beiranvand Pour (University Malaysia Terengganu, Malaysia)</i> <i>Jabar Habashi (Sahand University of Technology, Iran)</i> <i>Aidy M. Muslim (University Malaysia Terengganu, Malaysia)</i> <i>Khurram Riaz (University Malaysia Terengganu, Malaysia)</i>

Industry Forum-1: AI and Cybersecurity

13:30-15:00 | TUESDAY, 10 DEC, Room 360.4.031

How to Harness AI in Fintech Cybersecurity for Commercial Products

Abstract: Embark on an exclusive journey with Vikram as we uncover how leading commercial products from his cybersecurity company discreetly harness AI in fintech cybersecurity, elevating fraud detection in documents, credit risk analysis and scoring, biometric verification and customer onboarding and threat intelligence through sophisticated, real-time monitoring and analysis—revealing what often remains behind the scenes.



Vikram Sareen is Co-founder & CTO, Blue Bricks. He is also the Board Director, Non-Executive Board Member, Cybersecurity Expert, 5x Growth Booster, Ethic AI & Automation Supporter, MAICD. He has 24 years of serial entrepreneur with technology, business, innovation, commercialisation, growth thru' bootstrap/funding experience. He holds multiple awarded patents and successfully commercialised multiple B2B Enterprise products in these 20 years. He is regular speaker for discussion panels and events. He holds bachelor's degree from Defense College.

He has passion for problem solving using technology. Applicable tech solutions aim to address to business needs, eliminate business pain and bring more automation.

He is building multiple startups and also is independent "business technology advisor/director" to many small/large companies.

Oral Presentations

15:30-17:15 | TUESDAY, 10 DEC

Robotics-I		
Chairs: Kunqi Tang, Krishna Arjun		
Venue: 360.4.020		
Time	Paper ID	Title & Authors
15:30 - 15:45	30	Autonomous Localization Methods for Glasshouse Robot Navigation in Uncertain Situations: A Review <i>Junqi Gong (Shaoxing University, China)</i> <i>En Fan (Shaoxing University, China)</i>
15:45 - 16:00	34	Analyzing Multi-robot Task Allocation and Coalition Formation Methods: A Comparative Study <i>Krishna Arjun (Murdoch University, Australia)</i> <i>David Parlevliet (Murdoch University, Australia)</i> <i>Amirmehdi Yazdani (Murdoch University, Australia)</i> <i>Hai Wang (Murdoch University, Australia)</i>
16:00 - 16:15	64	Design and Experiment of High Ground Clearance Seedling Information Collection Robot <i>Yang Yang (Anhui Agricultural University, China)</i> <i>Zixiang Bai (Anhui Agricultural University, China)</i> <i>Xiaole Wang (Anhui Agricultural University, China)</i> <i>Yujie Liu (Anhui Agricultural University, China)</i> <i>Liangyuan Xu (Anhui Agricultural University, China)</i> <i>Sumei Liu (Anhui Agricultural University, China)</i> <i>Liqing Chen (Anhui Agricultural University, China)</i>
16:15 - 16:30	84	Design of Rope-driven Robotic Arm System for Loading and Unloading Scenarios <i>Yihao Wu (Tsinghua University, China)</i> <i>Tingyan Wen (Tsinghua Shenzhen International Graduate School, China)</i> <i>Haotian Yang (Tsinghua University, China)</i> <i>Junbo Tan (Tsinghua University, China)</i> <i>Xueqian Wang (Tsinghua University, China)</i>
16:30 - 16:45	90	Hierarchical Coordinated Trajectory Tracking Control of Wheeled Mobile Robot based on Dual Closed-loop Architecture <i>Kunxi Tang (Lanzhou Jiaotong University, China)</i> <i>Minan Tang (Lanzhou Jiaotong University, China)</i> <i>Xiaowei Chen (Lanzhou Jiaotong University, China)</i>
16:45 - 17:00	113	Robust Safe Learning and Control in Unknown Environments: An Uncertainty-separated Control Barrier Function Approach <i>Jiacheng Li (University of Science and Technology of China, China)</i> <i>Qingchen Liu (University of Science and Technology of China, China)</i> <i>Jiahu Qin (University of Science and Technology of China, China)</i>
17:00 - 17:15	15	Design and Simulation of Wheeled-legged Robot with Variable Configurations <i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>Chuanxin Ning (Jianghuai Advance Technology Center, China)</i> <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Peng Kang (Jianghuai Advance Technology Center, China)</i> <i>Xiao Juan Mo (Jianghuai Advance Technology Center, China)</i> <i>Yu Liu (Harbin Institute of Technology, China)</i> <i>Houde Liu (Tsinghua University, China)</i>

Robotics-II**Chairs: Xingdong Sun, Sheikh Azid****Venue: 360.4.021**

Time	Paper ID	Title & Authors
15:30 - 15:45	115	Extended Kalman Filter-based State Estimation for Wheel-legged Quadruped Robots <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Kai Liu (Jianghuai Advance Technology Center, China)</i> <i>Houde Liu (Tsinghua University, China)</i> <i>Lunfei Liang (Harbin Institute of Technology, China)</i>
15:45 - 16:00	88	A Motion Control Method of Cable-driven Manipulators based on Model Predictive Control <i>Tingyan Wen (Tsinghua Shenzhen International Graduate School, China)</i> <i>Yihao Wu (Tsinghua University, China)</i> <i>Haotian Yang (Tsinghua Shenzhen International Graduate School, China)</i> <i>Jianbo Tan (Tsinghua Shenzhen International Graduate School, China)</i> <i>Xueqian Wang (Tsinghua University, China)</i>
16:00 - 16:15	27	Adaptive Neutrosophic-based Extended Kalman Filter for Greenhouse Robot Navigation <i>En Fan (Shaoxing University, China)</i>
16:15 - 16:30	136	Intelligent Control Method for Efficient Apple Harvesting: Intelligent Vibration Harvesting Device <i>Xingdong Sun (Anhui Agricultural University, China)</i> <i>Yukai Zheng (Anhui Agricultural University, China)</i> <i>Panpan Yan (Heze Vocational College, China)</i> <i>Junjiang Li (Heze Vocational College, China)</i> <i>Li Wang (Anhui Agricultural University, China)</i> <i>Haowei Zhu (Anhui Agricultural University, China)</i>
16:30 - 16:45	31	Fuzzy Logic-based Control Strategy for the Coupling of a Fuel Cell and a Hydrogen-metal Hydride Tank <i>S.H.Suárez (Université de Toulouse, France)</i> <i>Djafar Chabane (UTBM, France)</i> <i>Sheikh Azid (Murdoch University, Australia)</i> <i>Ali Mohammadi (The University of the South Pacific, Fiji)</i>
16:45 - 17:00	29	An sEMG-based Teacher-student Network Model for Lower-limb Joint Torque Prediction <i>Zhe Sun (Zhejiang University of Technology, China)</i> <i>Xiaoyun Bi (Zhejiang University of Technology, China)</i> <i>Yuan Zhou (Zhejiang University of Technology, China)</i> <i>Feng Liu (Ningbo Tech University, China)</i>
17:00 - 17:15	81	Tail-assisted Self-adjustment for Enhanced Fall Balance and Stability in Wheeled-legged Robots <i>Yue Zhao (Jianghuai Advance Technology Center, China)</i>

Special Session on Advances in Unmanned Systems

Chairs: Keqi Mei, Weiming Liu

Venue: 360.4.022

Time	Paper ID	Title & Authors
15:30 - 15:45	35	Sampled-data Output Feedback Control for Path Tracking of Unmanned Agricultural Vehicles <i>Haozhe Li (Jiangsu University, China)</i> <i>Keqi Mei (Jiangsu University, China)</i> <i>Shihong Ding (Jiangsu University, China)</i> <i>Chen Ding (Fuyang Normal University, China)</i> <i>Jinlin Sun (Jiangsu University, China)</i>
15:45 – 16:00	175	An Embedded Collision-free Formation Control Scheme for an Air-ground Multi-robot System with Disturbances <i>Weiming Liu (Southeast University, China)</i> <i>Guodong Wang (Southeast University, China)</i> <i>Xiangyu Wang (Southeast University, China)</i> <i>Huiming Wang (Chongqing University of Posts and Telecommunications, China)</i> <i>Amirmehdi Yazdani (Murdoch University, Australia)</i> <i>Hai Wang (Murdoch University, Australia)</i>
16:00 - 16:15	5	Path Planning of Multi-objective Particle Swarm Optimization Unmanned Surface Vehicle based on Improved A* Algorithm <i>Jian Ren (Shanghai Maritime University, China)</i> <i>Weixiang Zhou (Shanghai Maritime University, China)</i>
16:15 – 16:30	16	Distributed Adaptive Time-varying Formation Control for USVs with Collision Avoidance <i>Yifan Lu (Shanghai University, China)</i> <i>Xiang Liu (Shanghai University, China)</i> <i>Haixiang Wu (Shanghai University, China)</i> <i>Yueying Wang (Shanghai University, China)</i>
16:30 - 16:45	47	Technical Principles for Shore Power System Planning <i>Ding Hao (Shanghai Maritime University, China)</i>
16: 45 - 17:00	91	Mechanical Design and Motion Control for a Novel Dexterous Torch Hand <i>Tianyu Liu (Jianghuai Advance Technology Center, China)</i> <i>Kang Peng (Jianghuai Advance Technology Center, China)</i>
17: 00 - 17:15	158	Tracking Control for 2-DOF Continuum Manipulator based on Anti-saturation Fixed-time Sliding Mode Method <i>Junfeng Sun (Linyi University, China)</i> <i>Ancai Zhang (Linyi University, China)</i> <i>Xiao Liang (Linyi University, China)</i> <i>Guangyuan Pan (Linyi University, China)</i> <i>Jianlong Qiu (Linyi University, China)</i>

Industry Forum-2: AI and Digital Twins with Applications 15:30-17:00 | TUESDAY, 10 DEC, 360.4.031

“Artificial Intelligence X Human Wisdom”, Is It the Right Key to a Future Fit Facility?

Kongsberg Digital – Kognitwin[®] Industrial Work Surface

Abstract: Building a "Facility of the Future" necessitates a completely transformative approach to industrial design and operations, particularly in remote locations like LNG Plants, large mines, refineries and many such heavy asset industrial fronts. Today the operators face the dilemma of either overwhelmingly complicated facilities with various technologies, and unfortunately without a cohesive strategy or alternatively & rightly adopting an adaptive framework that integrates IT, OT, and advanced technologies such as Artificial Intelligence (AI) and Large Language Models (LLMs) right at the project design stages of such heavy assets!

Remote facilities encounter unique challenges, including geographical isolation, high logistical costs, and the need for efficient workflow management. Digital twin technology, which creates a virtual representation of physical assets, offers a sophisticated solution to these challenges. When enhanced with AI and LLMs, digital twins leverage real-time data and advanced simulation capabilities to address common pain points experienced by operators and EPC contractors.

The integration of digital twins with AI brings numerous benefits:

1. **Optimized Facility Design:** AI-driven analytics facilitate a "digital by design" approach that reduces CAPEX and OPEX by predicting performance metrics and minimizing instrumentation costs.
2. **Enhanced Data Access:** A centralized, cloud-based data repository improves data quality control and contextualization throughout the project lifecycle.
3. **Advanced Safety Management:** AI-generated insights enhance risk assessments and safety protocols, while LLMs analyze historical data for comprehensive safety reporting.
4. **Cost Efficiency:** Remote operations and virtual site inspections, supported by AI, optimize project timelines and reduce costs.
5. **Improved Resource Allocation:** AI analytics enhance coordination of construction activities, while LLMs improve communication between teams.
6. **Refined Quality Control:** Machine learning transitions maintenance from reactive to predictive, minimizing rework costs.

By integrating digital twins with AI and LLMs, organizations can significantly improve decision-making, risk mitigation, and asset performance, setting a new standard for operational excellence in remote and challenging environments.



Siddharth Setia is General Manager APAC – Digital Energy, Sid leads Business Growth and Strategy in APAC prioritizing in Australia, New-Zealand, India & Japan. Sid joined Kongsberg Digital earlier this year after having spent 15+ years with fortune 500 Japanese Trading conglomerate Sumitomo, where he led a variety of roles in Supply Chain, Field Operations, Strategic Account Head and Digital Transformation along with regional BD Advisor for new technology investments division. Sid is a Mechanical Engineer Graduate (India) with a Post-Grad in Petroleum Engineering from Curtin University, Australia.

AGENDA

WEDNESDAY, 11 Dec

TIME	ACTIVITY	VENUE
08:30 - 17:30	Registration	360.4 Foyer
08:30 - 09:30		
09:30 - 10:30	Keynote Speech 3	360.4.031
10:30 - 11:00	Coffee Break	360.4 Foyer
11:00 - 12:00	Keynote Speech 4	360.4.031
12:00 - 13:30	Lunch	360.4 Foyer
13:30 - 15:00	Oral Presentation 7, 8,9 Industry Forum-3	
	Special Session on AI in Marine Science	360.4.020
	Power Electronics and Power Systems	360.4.021
	Special Session on Control Theory and Its Applications for Intelligent Mechatronic Systems	360.4.022
	Industry Forum-3 on Quantum Computing and AI	360.4.031
15:00 - 15:30	Coffee Break	360.4 Foyer
15:30 - 17:00	Oral Presentation 10, 11,12 Industry Forum-4	
	Topics in Modeling, Control, and Optimization of Complex Systems and Complex Data	360.4.020
	Intelligent Perception and Control of Unmanned Systems & Joint Model for Robotics and Autonomous Systems	360.4.021
	Special Session on Modeling, Estimation and Control for Robot Systems	360.4.022
	Industry Forum-4 on Quantum Computing and AI	360.4.031
17:25 - 17:30	Buses Departing to Kings Park (Gala Dinner Venue)	
18:00 - 19:00	Arriving at Kings Park, sightseeing and taking photos for koalas	
19:00 - 21:30	Conference Gala Dinner	Fraser's Restaurant, Kings Park
21:30	Buses Departing to Murdoch	

Keynote Speech 3



Zhihong Man

Professor, Swinburne University of Technology, Australia

Further Study of Lateral Dynamics of Road Vehicles

Abstract: In this talk, the lateral dynamics of road vehicles (LDRVs) is further studied from the view point of vehicle informatics. It is seen that the LDRVs is first decoupled in s-domain and the vehicle slip angle is proved to be directly observed or extracted from the yaw rate measurements. A new framework of parameter estimation methodology with the steady state information of yaw rate is then proposed, to accurately estimate the parameters of LDRVs in any fundamental period of sinusoidal steering angle input. Our new findings in this work will play a very important role of developing next generation of state estimation, parameter identification, soft-sensing, stability control and fault diagnosis of intelligent road vehicles. The simulation results are demonstrated to show the advantages and effectiveness of the new research results for LDRVs.

Bio: Zhihong received his B.E. degree from Shanghai Jiaotong University, China, in 1982, M.Sc degree from Chinese Academy of Sciences in 1987, and PhD degree from the University of Melbourne, Australia, in 1994. From 1994 to 1996, Zhihong was the Lecturer in the Department of Computer and Communication Engineering at Edith Cowan University, Australia. From 1996 to 2001, he was the Lecturer and then Senior Lecturer in the School of Engineering at The University of Tasmania, Australia. From 2002 to 2007, he was the Associate Professor of Computer Engineering at Nanyang Technological University, Singapore. From 2007 to 2008, he was with Monash University Sunway Campus, served as the Professor and Head of Electrical and Computer Systems Engineering and the Chair of the Monash Sunway Campus Research Committee. Zhihong is currently the Professor of Engineering in the School of Science, Computing and Engineering Technologies at Swinburne University of Technology, Melbourne, Australia.

Zhihong's research interests are in nonlinear control, signal processing, robotics, neural networks, engineering optimization and vehicle dynamics & control. He has published more than 300 research papers in refereed international journals and refereed international conferences proceedings, and his research results have widely cited more than 18600 times by the researchers from many countries. Since 1994, Zhihong has been involved in many international conferences in control, robotics, signal processing, neural networks and industrial electronics as the General Chair, Program Committee Chair, Track Chair, Session Chair, and the International Advisory Committee and Technical Committees member.

Keynote Speech 4



Vanessa Van Beek

Australian Security Lead, Avanade, Australia

Cybersecurity in the Age of AI

Abstract: In the rapidly evolving landscape of cybersecurity, generative AI presents both unprecedented challenges and transformative opportunities. As adversaries leverage AI for more sophisticated attacks, defenders must also harness AI's potential to protect organizations at the speed and scale of modern threats. This session examines the pivotal role of Generative AI-capabilities to deliver insights and elevate security operations.

This session will explore the realities of today's Security Operations Centres (SOCs), where analysts face mounting pressure to detect and respond to threats, manage incidents, and maintain a secure environment—all while navigating the complexities of training, knowledge management, and stakeholder communication. Generative AI offers a compelling solution to many of these challenges by automating repetitive tasks, enhancing threat intelligence, and enabling rapid incident response. A highlight of the session is a demonstration showcasing the application of generative AI in cybersecurity. Using a phishing incident scenario, we will illustrate how natural language prompts and AI-guided workflows can accelerate threat detection, response, and reporting.

We will also address pressing concerns about the security and privacy of data used by AI tools, emphasizing the importance of transparency, governance, and ethical practices. Join us to explore the intersection of artificial intelligence, machine learning, and cybersecurity.

Bio: Vanessa is an accomplished cyber security leader with deep industry experience. She has experience leading multi-disciplinary teams, embedding robust security into digital transformation. Vanessa's background includes Security Operations, Incident Management, Risk Governance and Solution Design. Vanessa is an advocate for continuous learning and knowledge sharing within the cyber security community seeing this as critical to staying ahead of emerging threats. Vanessa has spoken at conferences in Australia and has written for Australian Information Security Association (AISA) SecureGov and Cyber Australia publications.

She has 30 years of industry experience, coupled with a Law degree, Master of Business Administration, and a post-graduate diploma in Psychology, which guides her understanding of Technology, Risk, Strategy, and Culture. Her professional qualifications include CISM, CIPM and she is a graduate of the Cyber Leadership Institute. Vanessa is also a faculty member of the Cyber Leadership Institute and delivers training on Security Operations Leadership. Vanessa is also an adjunct lecturer at Murdoch University in the field of AI and Cybersecurity.

Her experiences have shaped to know crises are inevitable, and preparing to respond requires disciplined operational procedures, responsive leading-edge technology and a culture of teamwork and continuous

learning. In October 2024 she was awarded Leadership Award for CSO30 20 for her people-first philosophy in fostering a security-conscious culture and mentoring of emerging leaders in security. Vanessa also accepted the Cyber Security Champion Award at the 2024 Australian Women in Security Awards in Sydney.

She currently leads the Australian Cyber Security capability at Avanade leveraging the power of Accenture and Microsoft ecosystem. She leads the Australian team providing security services to protecting information, critical infrastructure, applications and key business processes from cyber threats. Most recently Vanessa led security operations and platform engineering and architecture at Kinetic IT.

Oral Presentations

13:30-15:00 | Wednesday, 11 DEC

Special Session on AI in Marine Science

Chairs: Yun Zhang, Herbert Ho-Ching Lu

Venue: 360.4.020

Time	Paper ID	Title & Authors
13:30 - 13:45	167	Enhancing Underwater Image Clarity through Phase Information Extraction and Processing <i>Xiuhan Liu (Ocean University of China, China)</i> <i>Zhaorui Gu (Ocean University of China, China)</i> <i>Wang Guoyu (Ocean University of China, China)</i> <i>Bing Zheng (Ocean University of China, China)</i> <i>Haiyong Zheng (Ocean University of China, China)</i>
13:45 - 14:00	39	Simplified MPC for Battery and Supercapacitor Hybrid System <i>Ujjal Manandhar (University of Western Australia, Australia)</i> <i>Xinan Zhang (University of Western Australia, Australia)</i> <i>Steward Qie (University of Western Australia, Australia)</i> <i>Herbert Ho-Ching Lu (University of Western Australia, Australia)</i> <i>Tyrone Fernando (University of Western Australia, Australia)</i>
14:00 - 14:15	51	Model Reference Adaptive Vibration Control for Floating Wind Turbine Using Neural Network-based Observer of Wind and Wave Force <i>Yun Zhang (Qingdao University of Science and Technology, China)</i> <i>Yandong Zhao (Qingdao University of Science and Technology, China)</i> <i>Yilong Wang (Qingdao University of Science and Technology, China)</i> <i>Baolin Zhang (Qingdao University of Science and Technology, China)</i>
14:15 - 14:30	92	A Deep learning Model for Predicting Dissolved Oxygen in Intensive Aquaculture Water <i>Wenkai Xu (China Agricultural University, China)</i> <i>Jianan Yang (China Agricultural University, China)</i> <i>Daoliang Li (China Agricultural University, China)</i>
14:30 - 14:45	116	OUC-MOI-ID: A Benchmark Dataset for Marine Organism Individual Identification <i>Qinyue Zhang (Ocean University of China, China)</i> <i>Zhensheng Shi (Ocean University of China, China)</i> <i>Naizhe Sun (Ocean University of China, China)</i> <i>Yangfan Wang (Ocean University of China, China)</i> <i>Bing Zheng (Ocean University of China, China)</i> <i>Haiyong Zheng (Ocean University of China, China)</i>
14:45 - 15:00	166	Non-destructive Detection of Sea Cucumber Saponins and Other Nutrients based on Hyperspectral Imaging and Ensemble Learning <i>Juan Li (Qingdao Agricultural University, China)</i> <i>Hao Deng (The University of Western Australia, Australia)</i> <i>Zifan Lin (The University of Western Australia, Australia)</i> <i>Xinan Zhang (University of Western Australia, Australia)</i> <i>Herbert Ho-Ching Lu (The University of Western Australia, Australia)</i> <i>Tyrone Fernando (The University of Western Australia, Australia)</i>

Power Electronics and Power Systems

Chairs: Xiaohan Fang, Xuan Li

Venue: 360.4.021

Time	Paper ID	Title & Authors
13:30 - 13:45	129	A Multi-level Interleaved Wide Range DC-DC Converter for Electric Vehicle Charging in DC Microgrids <i>Hao Deng (The University of Western Australia, Australia)</i> <i>Zifan Lin (The University of Western Australia, Australia)</i> <i>Xinan Zhang (University of Western Australia, Australia)</i> <i>Herbert Ho-Ching Lu (The University of Western Australia, Australia)</i> <i>Tyrone Fernando (The University of Western Australia, Australia)</i>
13:45 - 14:00	162	Improved Multi-scale Adaptive Extended Kalman Filter for Joint Estimation of Battery State of Charge and Capacity <i>Qiang Chi (Anhui university, China)</i> <i>Xiaohan Fang (Anhui University, China)</i> <i>Yuan Fan (Anhui University, China)</i>
14:00 - 14:15	53	Differential Algebraic Neural Networks based Transient Behaviour Prediction of Single-phase Grid-tied Inverters <i>Canjun Yuan (South China University of Technology, China)</i> <i>Zhicong Huang (South China University of Technology, China)</i>
14:15 - 14:30	60	Computer-aided Accurate Modeling for S-S Bidirectional-inductive-power-transfer Converters <i>Fei Xu (Hebei University of Technology, China)</i>
14:30 - 14:45	68	Imitation Learning based Model Predictive Control for Hybrid Active Power Filter <i>Cheng Gong (University of Macau, China)</i> <i>Chi-Seng Lam (University of Macau, China)</i>
14:45 - 15:00	96	Generalized Regression Forecasting of Typical Load Based on User Load Clustering <i>Xu Yaxin (WuHan Digital Engineering Institute, China)</i> <i>Linlin Pang (WuHan Digital Engineering Institute, China)</i> <i>Junwen He (China University of Geosciences (Wuhan), China)</i> <i>Xuan Li (China University of Geosciences (Wuhan), China)</i>
15:00 - 15:15	57	Ultrasonic evaluation of the effect of pulse discharge on the performance of lithium-ion batteries <i>Yuhang Liu (Southwest Jiaotong University, China)</i> <i>Zhaoyang Zhao (Southwest Jiaotong University, China)</i>

Special Session on Control Theory and Its Applications for Intelligent Mechatronic Systems

Chairs: Dan Wang, Jiankun Sun

Venue: 360.4.022

Time	Paper ID	Title & Authors
13:30 - 13:45	161	Adaptive Disturbance Rejection Control of PMSM Based on Filtering Adaptive Extended State Observer and Super-twisting Algorithm <i>Lai Wei (Dalian Maritime University, China)</i> <i>Dan Wang (Dalian Maritime University, China)</i>
13:45 - 14:00	11	A Current-constrained Finite-time Disturbance Rejection Control Scheme for Buck Converter <i>Xiaoduo Zhang (Chongqing University of Posts and Telecommunications, China)</i> <i>Zhize Zhang (Chongqing University of Posts and Telecommunications, China)</i> <i>Jiankun Sun (Huazhong University of Science and Technology, China)</i> <i>Yunda Yan (University College London, UK)</i> <i>Xiangyu Wang (Southeast University, China)</i> <i>Xianlun Tang (Chongqing University of Posts and Telecommunications, China)</i>

		<i>Huiming Wang (Chongqing University of Posts and Telecommunications, China)</i>
14:00 - 14:15	165	<p>Sampled-data Safety-critical Control of Nonlinear Systems with Input Delay</p> <p><i>Jiankun Sun (Huazhong University of Science and Technology, China)</i> <i>Huiming Wang (Chongqing University of Posts and Telecommunications, China)</i> <i>Xiangyu Wang (Southeast University, China)</i> <i>Yunda Yan (UCL, UK)</i> <i>Tiancheng Zhou (Huazhong University of Science and Technology, China)</i> <i>Xiaoduo Zhang (Chongqing University of Posts and Telecommunications, China)</i></p>
14:15 - 14:30	107	<p>Granger Causality based Sparse MLP for Flow Interruption Root Cause Diagnosis in Tobacco Manufacturing</p> <p><i>QingYuan Zheng (Southeast university, China)</i> <i>Zuo Wang (Southeast University, China)</i> <i>Cheng Qian (Southeast University, China)</i></p>
14:30 - 14:45	111	<p>A Bidirectional Iterative FABRIK-based Algorithm for Solving Null-space Motion of Continuum Robots</p> <p><i>Pingan Niu (Hefei University of Technology, China)</i> <i>Yunzhi Huang (Hefei University of Technology, China)</i> <i>Liang Han (Hefei University of Technology, China)</i> <i>Houde Liu (Tsinghua University, China)</i></p>
14:45 - 15:00	56	<p>Spatio-temporal Signal Evaluation of Robots Trajectories based on Signal Temporal Logic</p> <p><i>Song Liu (Jianghuai Advance Technology Center, China)</i> <i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>He Wang (Jianghuai Advance Technology Center, China)</i> <i>Xiaojun Zhu (Jianghuai Advance Technology Center, China)</i> <i>Gen Chen (Jianghuai Advance Technology Center, China)</i> <i>Yan Pan (Jianghuai Advance Technology Center, China)</i></p>
15:00 - 15:15	32	<p>Improved Control for Fractional-order and Non-minimum Phase Integrating Plants Using a Fractional IMC and SP Structure</p> <p><i>Anjana Ranjan (University of South Pacific, Fiji)</i> <i>Utkal Mehta (University of South Pacific, Fiji)</i> <i>Sheikh Izzal Azid (Murdoch University, Australia)</i></p>

Industry Forum 3: Quantum Computing and AI

13:30-15:00 | WEDNESDAY, 11 DEC, Room 360.4.031

The Current QAI/QML Landscape

Abstract: Artificial Intelligence and Machine Learning techniques are now integral to many fields and many production workflows. The current explosion in the application of these techniques is due to not just new algorithms but the availability of hardware capable of quickly multiplying matrices that lies at the heart of these approaches, namely high performance xPUs (like GPUs). Despite this renaissance, there are inherent limitations to current techniques where the energy cost of training large models on GPUs can be significant. Quantum computers and quantum machine learning offer a promising approach to address these technological hurdles by efficiently learning complex data patterns. We will give an overview of the current Quantum AI landscape, the current quantum computing technologies available, and the present limitations and future outlook for this fast evolving, cutting edge field.



Pascal Elahi is a high-performance and quantum computing expert, leading the Quantum Supercomputing Research Group at the Pawsey Supercomputing Research Centre. During his PhD in Astrophysics he developed an extensive track record of developing astronomical software for high-performance computing (HPC) systems. He works closely with the Australian Astronomical community running precursor radio telescopes to the upcoming SKA-Low radio telescope, the world's largest low frequency telescope. Pascal uses his expertise to help not only astronomers but researchers across various scientific fields scale their workflows to supercomputing systems and accelerate their science, such as assisting in the deployment ML and AI workflows for clinical health applications on supercomputing systems. His current focus is at the intersection of

Quantum Computing and Supercomputing, looking to integrate these technologies and grow the Quantum Computing community in Australia.

Oral Presentations

15:30-17:00 | Wednesday, 11 DEC

Modeling, Control, and Optimization of Complex Systems and Complex Data

Chairs: Jie Tian, Guolin Hu

Venue: 360.4.020

Time	Paper ID	Title & Authors
15:30 - 15:45	80	Traffic Pattern-driven Spatial-temporal Graph Contrastive Learning Framework for Traffic Forecasting <i>Hao Lee (University of Jinan, China)</i>
15:45 - 16:00	86	MSCNN-Att: Multi-scale CNN with Attention for Skin Lesion Classification <i>Yang Lian (University of Jinan, China)</i>
16:00 - 16:15	119	Data Augmentation-based Multiple Classifier Surrogate-assisted Evolutionary Algorithm for Expensive Many-objective Optimization Problems <i>Yuyao Zhang (Shandong Jianzhu University, China)</i> <i>Jie Tian (Shandong Women's University, China)</i> <i>Xinfeng Liu (Shandong Jianzhu University, China)</i> <i>Xiaoxu Zhang (University of Jinan, China)</i> <i>Chen Wu (Taiyuan University of Science and Technology, China)</i> <i>Ke Yang (Shandong Jianzhu University, China)</i>
16:15 - 16:30	138	Finite-time Annular Domain Stability and Stabilization of Stochastic Systems with Semi-Markovian Switching <i>Guolin Hu (Qilu University of Technology (Shandong Academy of Sciences), China)</i> <i>Zhengxiang Pan (Qilu University of Technology (Shandong Academy of Sciences), China)</i> <i>Baolong Zhu (Qilu University of Technology (Shandong Academy of Sciences), China)</i> <i>Zhiguo Yan (Qilu University of Technology, China)</i>
16:30 - 16:45	9	Optimizing Triple Exponentially Weighted Moving Average Controller Using TD3 Algorithm in the Semiconductor Manufacturing Process <i>Biao Jin (Anhui University, China)</i> <i>Tianhong Pan (Anhui University, China)</i> <i>Jiaqiang Tian (Anhui University, China)</i> <i>Shan Chen (Jiangsu University, China)</i>
16:45 - 17:00	12	Assessment of Achievable Renewable Energy Penetration Coefficient for Islanded Genset+Wind Farm Microgrids <i>Oleg Yakimenko (Naval Postgraduate School, USA)</i>

Intelligent Perception and Control of Unmanned Systems & Joint Model for Robotics and Autonomous Systems

Chairs: Chao Guo, Wutian Duan

Venue: 360.4.021

Time	Paper ID	Title & Authors
15:30 - 15:45	114	XFeat-VINS: Integrating Efficient Feature Extraction with Visual-inertial State Estimation for Robust Localization and Mapping <i>Xiangyang Chen (Jianghuai Advance Technology Center, China)</i> <i>Bangguo Wei (Jianghuai Advance Technology Center, China)</i> <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>Houde Liu (Tsinghua University, China)</i>

15:45 - 16:00	118	A Fast and Robust Local Descriptor for 3D Point Cloud Registration <i>Chao Guo (Jianghuai Advance Technology Center, China)</i> <i>Bangguo Wei (Jianghuai Advance Technology Center, China)</i> <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>Houde Liu (Tsinghua University, China)</i>
16:00 - 16:15	103	Deep Reinforcement Learning based Robust Adaptive Control of Hypersonic Flight Vehicles <i>Muhang Yu (Northwestern Polytechnical University, China)</i> <i>Xia Wang (Shandong University, China)</i> <i>Yanbin Chen (Northwestern Polytechnical University, China)</i> <i>Xiaolei Qu (Northwestern Polytechnical University, China)</i> <i>Bin Xu (Northwestern Polytechnical University, China)</i>
16:15 - 16:30	95	An Improved YOLOv8 Algorithm for Apple Object Recognition and Localization in Complex Environment <i>Wutian Duan (Xi'an Technological University, China)</i> <i>Lin Li (Xi'an Technological University, China)</i> <i>Chaobo Chen (Xi'an Technological University, China)</i> <i>Rong Zhang (Xi'an Technological University, China)</i>
16:30 - 16:45	87	A Time-delay Approach for Stabilization of Linear Systems with Unknown Control Direction <i>Gaofeng Pan (Zhejiang University, China)</i> <i>Yang Zhu (Zhejiang University, China)</i> <i>Zhengguang Wu (Zhejiang University, China)</i>
16:45 - 17:00	67	Understanding and Rethinking LiDAR-inertial Odometry <i>Hongqian Huang (Xi'an Jiaotong University, China)</i> <i>Meng Zhang (Xi'an Jiaotong University, China)</i> <i>Chengshuai Wu (Xi'an Jiaotong University, China)</i> <i>Bo Fan (Xi'an Jiaotong University, China)</i> <i>Jianchen Hu (Xi'an Jiaotong University, China)</i>
17:00 - 17:15	93	Anthropomorphic Grasping Approach for the Upper Limbs of a Humanoid Robot <i>Tianyu Liu (Jianghuai Advance Technology Center, China)</i> <i>Yingmei Tan (Jianghuai Advance Technology Center, China)</i> <i>Houde Liu (Tsinghua University, China)</i>

Special Session on Modeling, Estimation and Control for Robot Systems
Chairs: Chao Ma, Linqi Ye
Venue: 360.4.022

Time	Paper ID	Title & Authors
15:30 - 15:45	157	Sensorless Fractional-order PI Control of High Power Propulsion PMSM based on Fast Terminal Sliding Mode Observer <i>Sheikh Azid (Murdoch University, Australia)</i>
15:45 - 16:00	38	Robust Control of Quadrotor with Online Unknown Disturbances Rejection Approach via Machine Learning <i>Sheikh Azid (Murdoch University, Australia)</i>
16:00 - 16:15	143	Adaptive Sliding Mode Control for Lower Limb Rehabilitation Robot System with Uncertainty <i>Hao Sun (Hefei University of Technology, China)</i> <i>Xin Wang (Hefei University of Technology, China)</i> <i>Chao Ma (Hefei University of Technology, China)</i>
16:15 - 16:30	109	Error Analysis and Kinematic Calibration of Quaternion Joint Continuum Robot <i>Lei He (Hefei University of Technology, China)</i>

		<p><i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Yunzhi Huang (Hefei University of Technology, China)</i> <i>Liang Han (Hefei University of Technology, China)</i></p> <p>Design of Cable-driven Continuum Robots with Linkage Quaternion Joint</p>
16:30 - 16:45	112	<p><i>Yu Guo (Hefei University of Technology, China)</i> <i>Yunzhi Huang (Hefei University of Technology, China)</i> <i>Liang Han (Hefei University of Technology, China)</i> <i>Wenfu Xu (Harbin Institute of Technology, China)</i></p> <p>Cooperative Formation Control of USVs and UAVs based on Reinforcement Learning</p>
16:45 - 17:00	122	<p><i>Ting Wu (Shanghai University, China)</i> <i>Linqi Ye (Shanghai University, China)</i> <i>Xianglong Li (Beijing University of Chemical Technology, China)</i> <i>Yan Peng (Shanghai University, China)</i></p> <p>Research on Attitude Adaptive Control of High Ground Gap Plant Protection Machine (HGPM) Based on BP Neural Network PID</p>
17:00 - 17:15	134	<p><i>Zengbin Cai (Anhui Agricultural University, China)</i> <i>Liqing Chen (Anhui Agricultural University, China)</i> <i>Ling Wan (Anhui Agricultural University, China)</i></p>

Industry Forum 4: Quantum Computing and AI

15:30-17:00 | WEDNESDAY, 11 DEC, Room 360.4.031

The Current QAI/QML Landscape

Abstract: In this talk, practical challenges in integrating quantum computing with optimization and machine learning will be addressed and several interesting examples will be detailedly introduced and elaborated.



Casey Myers is a Senior Lecturer in Quantum Computing at the University of Western Australia and a Quantum Supercomputing Researcher at the Pawsey Supercomputing Research Centre. He is a respected expert in quantum algorithms and the theory of quantum systems. He has over 15 years experience working in the quantum technologies sector, as both a researcher in the deep tech industry and an academic, pioneering quantum algorithms for both optical and solid state architectures. He has taught extensively in physics, mathematics, and computer science, and has worked in the banking and geosciences industries, developing techniques for various computationally demanding applications. a Senior Corporate Finance Analyst working at Western Power. He is an energy professional with experience working in electricity networks, retail and generation. Miles has worked for Perth Energy, Collgar Wind farm, Western Power and is currently leading the Whole of System Plan for the Energy Transformation Implementation Unit.



Edric Matwiejew has expertise in quantum algorithms and software development for the high-performance simulation of quantum algorithms. His research focuses on the design of near-term algorithms to address practical challenges in optimization and machine learning. He holds a PhD in Computational Physics from the University of Western Australia, where he is a member of the Quantum Information Simulation and Algorithms research hub. Edric has published in high-impact journals such as the Journal of Computational Science and Quantum, and has presented at international conferences, including ISC and IEEE Quantum Week.

AGENDA

THURSDAY, 12 Dec		
TIME	ACTIVITY	VENUE
08:30 - 17:30	Registration	360.4 Foyer
08:30 - 09:30		
09:30 - 10:30	Keynote Speech 5	360.4.031
10:30 - 11:00	Coffee Break	360.4 Foyer
11:00 - 12:00	Keynote Speech 6	360.4.031
12:00 - 13:30	Lunch	360.4 Foyer
	Oral Presentations 13, 14, 15	
13:30 - 15:00	Special Session on Advanced Control of Euler-Lagrange Systems	360.4.021
	Special Session on Robust Control and Adaptive Optimization of Complex Dynamical Systems	360.4.022
	Special Session on Security Control, Optimization and Games of Intelligent Networked Systems with Its Applications in Advanced Robotics	360.4.031
15:00 - 15:30	Coffee Break	360.4 Foyer
	Oral Presentations 16, 17, 18	
15:30 - 17:15	Special Session on Sliding Mode Control of Nonlinear Systems-I	360.4.021
	Special Session on Sliding Mode Control of Nonlinear Systems-II and Modeling, Perception and Locomotion of Humanoid Robots	360.4.022
	Modeling, Control and Optimisation of Nonlinear Systems with Applications	360.4.031
17:30 - 18:30	Closing Ceremony	360.4.031

Keynote Speech 5



Yongsheng Gao

Professor, Griffith University, Brisbane, Australia
Director of ARC Industrial Transformation Research Hub for Driving Farming Productivity and Disease Prevention

Very Similar Object Recognition with Few Examples

Abstract: Artificial intelligence and machine learning has achieved remarkable performance in extensive vision tasks such as object classification and detection. Such superior performances, however, heavily rely on a very large scale of labeled data for training, which in practice is often expensive and infeasible to obtain. Similar object recognition (fine-grained visual categorization) and very similar object recognition (ultra-fine-grained visual categorization) remains challenging open problems in the research community. This talk will introduce our effort towards bridging this gap, i.e., enabling image classification of very similar objects and when only few examples are available. Some recent works such as ultra-fine-grained visual categorization beyond human performance, CNNs and vision transformers for very similar object recognition, retinal blood vessel analysis will be discussed.

Bio: Professor Yongsheng Gao is the Director of Australian Research Council (ARC) Industrial Transformation Research Hub for Driving Farming Productivity and Disease Prevention. He was a member of College of Experts, Australian Research Council, and Director of Institute for Integrated and Intelligent Systems, Griffith University. He made significant contributions to both fundamental theories and applied research that has solved important industrial problems, and continually publishes in the prestigious journals and conferences in his discipline, including *IEEE Transactions on Pattern Analysis and Machine Intelligence*, *International Journal of Computer Vision*, *IEEE Transactions on Image Processing*, *IEEE Transactions on Neural Network and Learning Systems*, *IEEE Transactions on Medical Imaging*, *IEEE Transactions on Circuits and Systems for Video Technology*, *Pattern Recognition*, *IEEE Transactions on Geoscience and Remote Sensing*, *IEEE Transactions on Information Forensics and Security*, The International Conference on Computer Vision, International Joint Conference on Artificial Intelligence, The AAAI Conference on Artificial Intelligence, IEEE International Conference on Computer Vision and Pattern Recognition. As a Chief Investigator, he has been working on projects in Australia, Singapore, Germany, and China in the areas of smart farming, environmental informatics, image analysis, computer vision, pattern recognition, medical imaging, and face recognition. He was also employed as a consultant by Panasonic Singapore Laboratories Pte Ltd working on the face recognition standard in MPEG-7. His researches were reported in the media in Australia and Singapore, including *The Australian*, *The Courier Mail*, *The Sydney Morning Herald*, and *The Straits Times (Singapore)*.

Keynote Speech 6



Renu Kannu

Business Partnerships Lead, Australian Automation and Robotics Precinct (AARP), Perth, Australia

Leveraging the Australian Automation and Robotics Precinct: The role of innovation Infrastructure in supporting companies working in robotics, automation and zero emissions technologies to test, validate and accelerate their technology development

Abstract: The AARP is a 51-hectare site that has been made available by DevelopmentWA, and is being operated by CORE Innovation Hub. The Precinct includes multiple test beds that can accommodate a range of vehicles, equipment, field robots, drones and other technologies. The AARP is Australia's largest test, R&D, demonstration and training ground - for emerging automation and robotics systems and equipment, remote operations and zero emissions technology. CORE is establishing the AARP as a world-class facility that is dynamic, collaborative, accessible and global.

In addition to the physical test bed environment, the recently completed AARP Headquarters is a collaborative facility equipped with co-working space, meeting rooms and offices, a control room and training facilities, technical labs, exhibition areas and full amenities. The AARP caters to startups, small and medium-sized businesses, mid-tier miners and Tier 1 operators - across sectors including mining, resources and energy, construction, agriculture, manufacturing, defence and space.

Bio: Renu is responsible for igniting a thriving innovation community in Perth and across the broader ecosystem. Her superpowers include project management, stakeholder engagement, strategic partnerships and growth strategies. Renu's industry expertise is at the intersection of the energy, resources, space and defence sectors, with domain specialities in robotics, automation and greentech. She has well established networks in the global market having lived and worked in Australia and Europe.

Oral Presentations

13:30-15:00 | THURSDAY, 12 Dec

Special Session on Advanced Control of Euler-Lagrange Systems

Chairs: Xiaozheng Jin, Haijiao Yang

Venue: 360.4.021

Time	Paper ID	Title & Authors
13:30-13:45	19	Horizontal Plane Trajectory Tracking of Underwater Vehicle based on Exponential Backstepping and Continuous Sliding Mode Control <i>Dan Wang (Shenyang University, China); Haolin Li (Shenyang University, China); Xiaozheng Jin (Qilu University of Technology (Shandong Academy of Sciences), China)</i>
13:45-14:00	44	Adaptive NN-based Secure Control for Disturbed Euler-Lagrange Systems with DoS Attacks <i>Shaoyu Lv (Anhui University of Technology, China); Bingheng Yan (Qilu University of Technology (Shandong Academy of Sciences), China)</i>
14:00-14:15	45	Distributed Adaptive Fixed-time Hierarchical Sliding Mode Control for High-order Nonlinear Multi-agent Systems <i>An Liu (Anhui University, China) Haijiao Yang (Anhui University, China) Libai Xiang (Anhui University, China)</i>
14:15-14:30	125	Fuzzy Hybrid Observer-based Fault Estimation for Euler-Lagrange Systems with Aperiodic Measurements <i>Jingjing Yan (AVIC Shenyang Aircraft Corporation, China) Jialu Yin (AECC Shenyang Engine Research Institute, China) Zhuo Jiang (AVIC Shenyang Aircraft Design and Research Institute, China) Chao Deng (Nanjing University of Posts and Telecommunications, China)</i>
14:30-14:45	126	Adaptive Neural Network-based Anti-disturbance Formation Control of Multi-agent Systems <i>Yuhan Hou (Qilu University of Technology, China); Xiaozheng Jin (Qilu University of Technology (Shandong Academy of Sciences), China)</i>
14:45-15:00	128	Adaptive Pinning Synchronization of Dynamical Complex Networks with Negative Weights and Multiple Sizes of Delays <i>Dan Wang (Shenyang University, China) Xiaozheng Jin (Qilu University of Technology (Shandong Academy of Sciences), China)</i>

Special Session on Robust Control and Adaptive Optimization of Complex Dynamical Systems

Chairs: Lei Chen, Chengcheng Ren

Venue: 360.4.022

Time	Paper ID	Title & Authors
13:30-13:45	23	Neuroadaptive Quantized Dynamic Surface Control for Uncertain Nonstrict-feedback Nonlinear Systems with Output Constraints <i>Penghao Chen (Jiangnan University, China) Xiaoli Luan (Jiangnan University, China) Fei Liu (Jiangnan University, China)</i>
13:45-14:00	40	Feedforward-feedback Event-triggered Model Predictive Control for Intelligent Vehicles based on Proximal Policy Optimization <i>Minyan Jin (Shanghai University, China) Qing Sun (Shanghai University, China)</i>

14:00-14:15	6	Finite-region H_∞ Filtering for 2-D Markov Jump Systems: The FM Model Case <i>Jiankang Fang (Anhui University, China)</i> <i>Shuping He (Anhui University, China)</i> <i>Chengcheng Ren (Anhui University, China)</i> <i>Tao Yu (Anhui University, China)</i>
14:15-14:30	148	Rheological Properties Prediction of Carbon Fiber Spinning Solution based on Physics-informed Gaussian Process Regression <i>Guanghao Cao (Donghua University, China)</i> <i>Lei Chen (Donghua University, China)</i> <i>Haoyan Dong (Donghua University, China)</i> <i>Kuangrong Hao (Donghua University, China)</i>
14:30-14:45	159	Design and Heat Transfer Optimization of Finned Multi-tubular Metal Hydride Tank <i>Djafar Chabane (UTBM, France)</i> <i>Alaeddine ZEREG (UTBM, France)</i> <i>Ali Mohammadi (University of South Pacific, Fiji)</i> <i>Sheikh Azid (Murdoch University, Australia)</i> <i>Nadhir LEBAAL (UTBM, France)</i>
14:45-15:00	7	Finite-region Dissipative Control 2D Markov Jump Systems: The FM Model Case <i>Jiabao Wei (Anhui University, China)</i> <i>Chengcheng Ren (Anhui University, China)</i> <i>Shuping He (Anhui University, China)</i>

Special Session on Security Control, Optimization and Games of Intelligent Networked Systems with Its Applications in Advanced Robotics

Chairs: Hel Li, Xin Wang

Venue: 360.4.031

Time	Paper ID	Title & Authors
13:30-13:45	36	New Approach to H_∞ Dynamic Output Feedback Control of Singular Fractional-order Systems <i>He Li (Shenyang Aerospace University, China)</i> <i>Minghui Wei (Shenyang Aerospace University, China)</i> <i>Shuo Liu (Shenyang Aerospace University, China)</i> <i>Shanze Wang (Shenyang Aerospace University, China)</i>
13:45-14:00	101	From NL2SQL to NL2Code: Exploring a New Paradigm for Natural Language to Programming Code Generation <i>Lihe Tang (NARI Technology Co., Ltd, China)</i> <i>Zhuqing Hu (NARI Group Corporation, China)</i> <i>Yitian Liu (NARI Group Corporation, China)</i>
14:00-14:15	124	Distributed Hybrid Observer Design for Large-scalar Interconnected Systems under Intermittent Measurements <i>Jingjing Yan (AVIC Shenyang Aircraft Corporation, China)</i> <i>Hongwei Deng (AECC Shenyang Engine Research Institute, China)</i> <i>Yan Guo (Representative Office of Equipment Department of Shenyang, China)</i> <i>Chao Deng (Nanjing University of Posts and Telecommunications, China)</i>
14:15-14:30	149	ADP-based Distributed Learning Optimal Control for Linear Multi-agent Systems with Actuator Faults <i>Sijin Shi (Heilongjiang University, China)</i> <i>Meng Cui (Heilongjiang University, China)</i> <i>Jing Ma (Heilongjiang University, China)</i> <i>Xin Wang (Heilongjiang University, China)</i>
14:30-14:45	150	Distributed Fault Estimation for Multi-agent Systems under a Random Switching Topology

14:45-15:00

	<i>Chunlei Zhang (Heilongjiang University, China)</i> <i>Xin Wang (Heilongjiang University, China)</i> <i>Xiaona Yang (Heilongjiang University, China)</i> <i>Xian Zhang (Heilongjiang University, China)</i>
17	Event-triggering Control for Stochastic Cyber-physical Systems with Deception Attacks <i>Jiawei Huang (Nanjing University of Posts and Telecommunications, China)</i>

Oral Presentations

15:30-17:00 | THURSDAY, 12 DEC

Special Session on Sliding Mode Control of Nonlinear Systems and Its Applications

Chairs: Jinlin Sun, Yan Yan

Venue: 360.4.021

Time	Paper ID	Title & Authors
15:30 - 15:45	21	Third-order Super-twisting Sliding Mode Observer-based Robust Model Predictive Direct Speed Control for PMSM Drives <i>Yiqing Ma (Jiangsu University, China)</i> <i>Shihong Ding (Jiangsu University, China)</i> <i>Keqi Mei (Jiangsu University, China)</i> <i>Jinlin Sun (Jiangsu University, China)</i>
15:45-16:00	33	Observer-based Consensus of Positive Markov Jump Multi-agent Systems <i>Zhentai Duan (Hainan University, China)</i> <i>Linyan Han (Hainan University, China)</i> <i>Wei Xing (Hainan University, China)</i> <i>Junfeng Zhang (Hainan University, China)</i>
16:00-16:15	69	Event-triggered Sliding Mode Formation Control for Unmanned Surface Vehicles via Quantized Communication <i>Yan Yan (Dalian Maritime University, China)</i> <i>Huizhu Wu (Dalian Maritime University, China)</i> <i>Yanqing Hou (Dalian Maritime University, China)</i> <i>Shuanghe Yu (Dalian Maritime University, China)</i>
16:15-16:30	117	Adaptive Generalized Super-twisting Control for Robot Manipulators <i>Xixi He (Shanghai University of Electric Power, China)</i> <i>Jianliang Mao (Shanghai University of Electric Power, China)</i> <i>Long Xu (Shanghai University of Electric Power, China)</i> <i>Chuanlin Zhang (Shanghai University of Electric Power, China)</i>
16:30-16:45	169	Adaptive Sliding Mode Controller based on Predefined-time Disturbance Observer for PMSM System <i>Long Chen (Hangzhou Dianzi University, China)</i> <i>Meizi Zhang (Hangzhou Dianzi University, China)</i>
16:45-17:00	171	Position Tracking Strategy of PMSM based on Fixed-time Integrating Sliding Mode <i>Mingliang Wang (Hangzhou Dianzi University, China)</i> <i>Bin Yan (Hangzhou Dianzi University, China)</i> <i>Long Chen (Hangzhou Dianzi University, China)</i>

Special Session on Sliding Mode Control of Nonlinear Systems and Modeling, Perception and Locomotion of Humanoid Robots

Chairs: Wei Ji, Yan Pan

Venue: 360.4.022

Time	Paper ID	Title & Authors
15:30 - 15:45	172	A Novel Integral Predefined-time Sliding Mode Control for PMSM <i>Qiming Wang (Hangzhou Dianzi University, China)</i> <i>Long Chen (Hangzhou Dianzi University, China)</i>
15:45-16:00	13	An Improved Nonsingular Fast Terminal Sliding Mode Controller for PMSM Drive System <i>Kaiyang Wu (Jiangsu university, China)</i> <i>Xin Wang (Jiangsu University, China)</i>

		<i>Bo Xu (Jiangsu University, China)</i> <i>Wei Ji (Jiangsu University, China)</i> <i>Shihong Ding (Jiangsu University, China)</i> <i>Yongqi Jiang (Zhejiang Zhenghao Refractory Materials Co. Ltd, China)</i> <i>Yonggui Zha (Zhejiang Zhenghao Refractory Materials Co. Ltd, China)</i>
16:00-16:15	28	Robust Control of Lower Limb Rehabilitation Exoskeleton Robot Using Fractional-order Sliding Mode <i>Zhe Sun (Zhejiang University of Technology, China)</i> <i>Xun Zhou (Zhejiang University of Technology, China)</i> <i>Yuan Zhou (Zhejiang University of Technology, China)</i> <i>Feng Liu (Ningbo Tech University, China)</i> <i>Bo Chen (Zhejiang University of Technology, China)</i>
16:15-16:30	127	A Hierarchical Motion Planning Framework for Reactive Cooperative Operation of Dual-mobile Manipulators <i>Rongxiu Zhu (Hefei University of Technology, China)</i> <i>Liang Han (Hefei University of Technology, China)</i> <i>Lei Yan (Harbin Institute of Technology, China)</i> <i>Yunzhi Huang (Hefei University of Technology, China)</i> <i>Kang Peng (Jianghuai Advance Technology Center, China)</i>
16:30-16:45	52	Trajectory Prediction for Robots with Control Mechanism-guided Parameter Reinforcement Learning <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>He Wang (Jianghuai Advance Technology Center, China)</i> <i>Xiaojun Zhu (Jianghuai Advance Technology Center, China)</i> <i>Geng Chen (Jianghuai Advance Technology Center, China)</i> <i>Yan Pan (Jianghuai Advance Technology Center, China)</i>
16:45-17:00	54	Multiple Attribute Trajectory State Evaluation for Robots based on Data Augmentation <i>Xiaojun Zhu (Jianghuai Advance Technology Center, China)</i> <i>Lunfei Liang (Harbin Institute of Technology, China)</i> <i>Song Liu (Jianghuai Advance Technology Center, China)</i> <i>Bin Lan (Jianghuai Advance Technology Center, China)</i> <i>Yan Pan (Jianghuai Advance Technology Center, China)</i>

Modeling, Control and Optimisation of Nonlinear Systems with Applications

Chairs: Tianhong Pan, Thach Ngoc Dinh

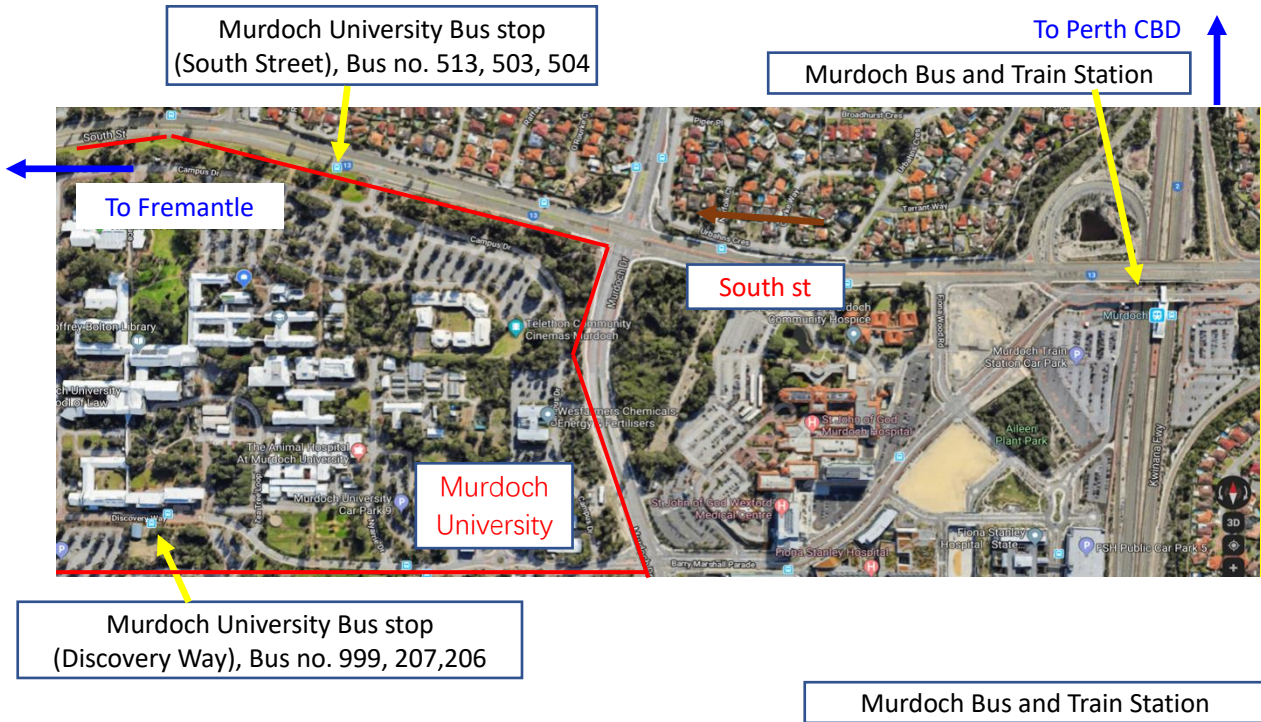
Venue: 360.4.031

Time	Paper ID	Title & Authors
15:30 - 15:45	25	Optimization Analysis of Flow Field of Cleaning Machine Air Duct based on Fluent Parameter Simulation <i>Ruizhuo Feng (Anhui Agricultural University, China)</i> <i>Kuan Qin (Anhui Agricultural University, China)</i>
15:45 - 16:00	98	Fault Detection for Rub-Impact of Turbopump Rotors based on Nonlinear Interval Observers <i>Hongru Jiang (Northwestern Polytechnical University, China)</i> <i>Yue Guo (Northwestern Polytechnical University, China)</i> <i>Quan-Yong Fan (Northwestern Polytechnical University, China)</i>
16:00 - 16:15	18	STLagGCN: A Spatial-temporal Lagged Graph Convolution Network for Traffic Forecasting <i>Jinghang Zhao (University of Jinan, China)</i> <i>Shiyuan Han (Shandong Women's University, China)</i>
16:15 - 16:30	20	MSFCAN: Multi-scale Feature and Context Aggregation Network for LiDAR Segmentation

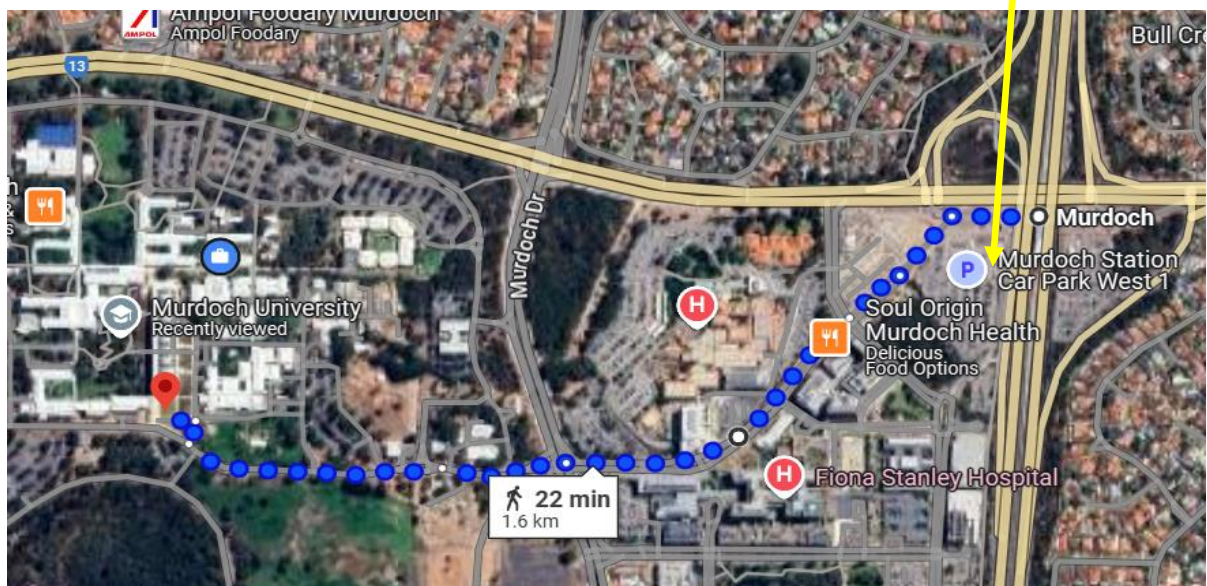
		<i>Caiyun Shan (University of Jinan, China)</i>
16:30 - 16:45	22	Interval Observer for Battery and Motor Circuit Model of Electric Vehicles <i>Thach Ngoc Dinh (Conservatoire National des Arts et Métiers, France)</i> <i>Wissam Khennoune (Conservatoire National des Arts et Métiers, France)</i> <i>Amélie Lambert (Conservatoire National des Arts et Métiers, France)</i> <i>Mathieu Moze (Conservatoire National des Arts et Métiers, France)</i>
16:45 - 17:00	77	Data-driven Compensation-based Backstepping Sliding Mode Heading Control for Unmanned Sailboats <i>Chen-Ming Li (Qingdao university of science and technology, China)</i> <i>Bao-Lin Zhang (Qingdao university of science and technology, China)</i> <i>Yan Ji (Qingdao university of science and technology, China)</i> <i>Wei Zhang (Qingdao university of science and technology, China)</i> <i>Bo Yin (Ocean University of China, China)</i>

Conference Site (Boola Katitjin, Building 360)

Take Train or Bus

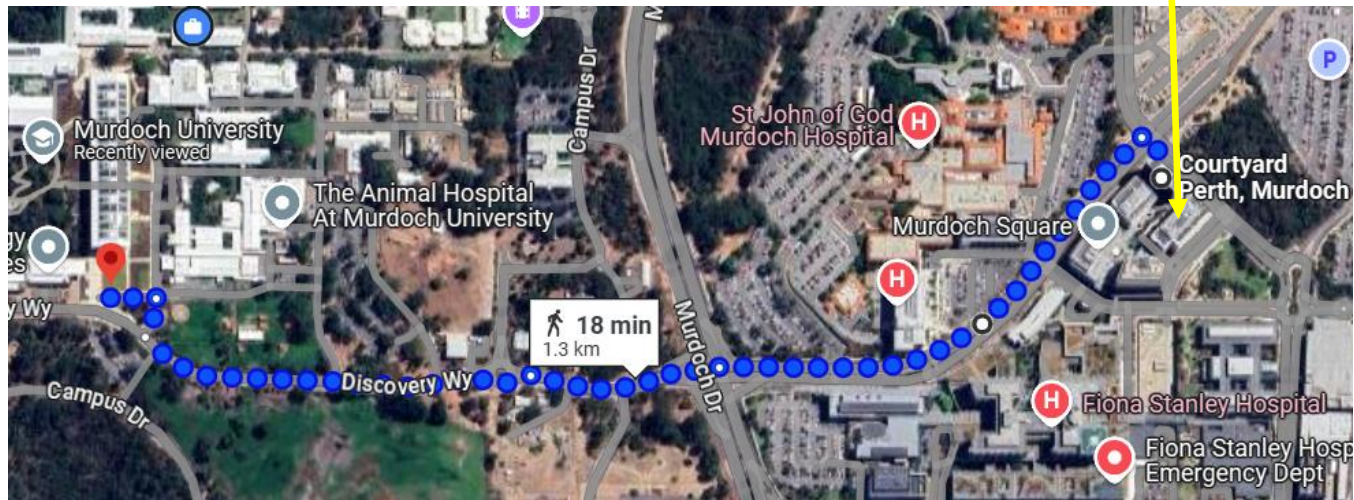


Walk From/to Murdoch Train or Bus Station to Boola Katitjin

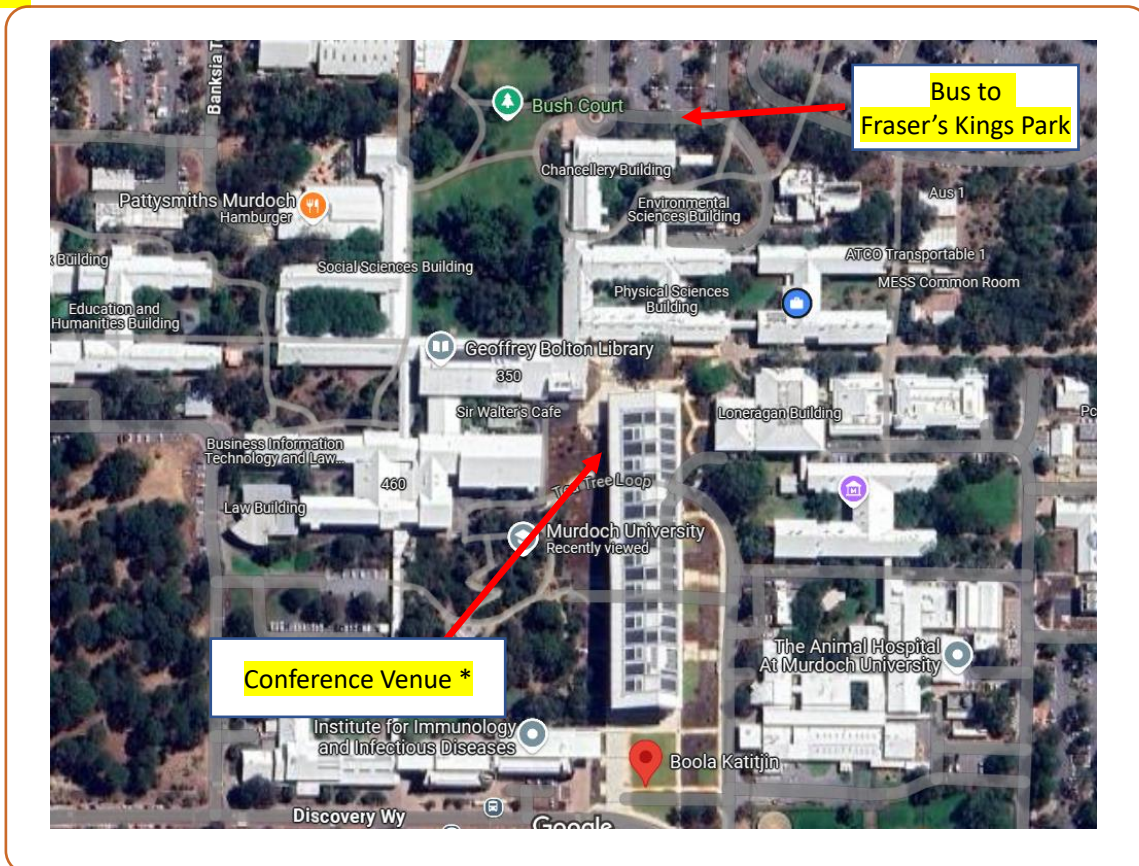


Walk From/to Courtyard Hotel (Murdoch) to Boola Katitjin

Courtyard Hotel



Zoomed Area



*Conference venue: Registration desk, welcome reception, lunch, coffee break, oral presentation, etc.

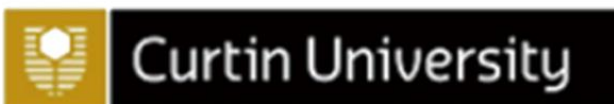
Organised by



Sponsored by



Supported by





1st International Conference on Advanced Robotics, Control, and Artificial Intelligence

ARCAI 2024

9 - 12 December 2024

Perth, Australia



 **ARCAI 2024**

PERTH, AUSTRALIA DEC. 9-12, 2024

MU **Murdoch
University**