



中关村国际会展
ZGC FORUM & EXHIBITION



中关村论坛
2025 ZGC FORUM

系列活动
Regular Activities



BAS
北京国际学术交流季
BEIJING INTERNATIONAL ACADEMIC SEASON

IFAC HMS 2025

The 16th IFAC Symposium on Analysis, Design and Evaluation of
Human-Machine Systems

Nov 18-21, 2025, Beijing, China

CONFERENCE PROGRAM

Sponsor

International Federation of Automatic Control, IFAC

Co-Sponsors

The International Federation of Operational Research Societies, IFORS
CAST UN Consultative Committee on Artificial Intelligence Capacity-Building

Hosts

Chinese Association of Automation, CAA
Institute of Automation, Chinese Academy of Sciences, CASIA
University of Shanghai for Science and Technology, USST





**16TH IFAC SYMPOSIUM ON ANALYSIS, DESIGN AND EVALUATION OF
HUMAN-MACHINE SYSTEMS (IFAC HMS 2025)**

Welcome Message

On behalf of the organizing committee, it is with great pleasure that we welcome you to the 16th IFAC Symposium on Analysis, Design, and Evaluation of Human-Machine Systems (IFAC HMS 2025). This premier event is held under the auspices of the International Federation of Automatic Control (IFAC), the world's foremost organization in the field of automatic control. We are proud to co-organize this symposium with the Chinese Association of Automation (CAA), the Institute of Automation, Chinese Academy of Sciences (CASIA), and the University of Shanghai for Science and Technology (USST). This gathering truly stands as a flagship event in the global human-machine systems research community.

We are honored to host you in Beijing, a city where millennia of rich history and vibrant culture converge with modern technological innovation and academic vitality. From the majesty of the Great Wall to the elegance of the Forbidden City, Beijing stands as a global hub for scientific research, education, and technological advancement. Here, in this dynamic city, we gather for four days (November 18th to 21st, 2025) to connect with peers, share insights, and transcend the boundaries of geography and discipline.

This symposium is dedicated to the frontiers of human-machine systems research, covering the full spectrum of analysis, design, and evaluation. It serves as a leading platform for showcasing the latest scientific breakthroughs, from advancements in brain-computer interfaces and AI-driven perception to the intricate control of cooperative multi-agent systems and wearable robotics. These innovations are finding critical applications in domains such as rehabilitation, intelligent vehicles, and diagnostics for neurodegenerative diseases. Through a diverse program of high-level academic activities, including keynote speeches from world-renowned experts, in-depth paper presentations, and interactive workshops, we aim to facilitate profound exchanges, spark innovative ideas, and foster collaborative partnerships. We firmly believe that the cross-cultural and interdisciplinary dialogue here will inspire new research directions, forge lasting collaborations, and make significant contributions to the advancement of human-machine systems.

Once again, we extend our warmest welcome to each of you. We hope your time in Beijing is filled not only with academic enrichment and inspiring interactions but also with wonderful, lasting memories. We look forward to embarking on this intellectual journey with you, exploring the frontiers of knowledge and shaping the future of human-machine systems together.

Best wishes



NOC Chair
Zeng-Guang Hou

Institute of Automation, Chinese Academy of Sciences



IPC Chair
Sören Hohmann

Karlsruhe Institute of Technology, Campus Süd



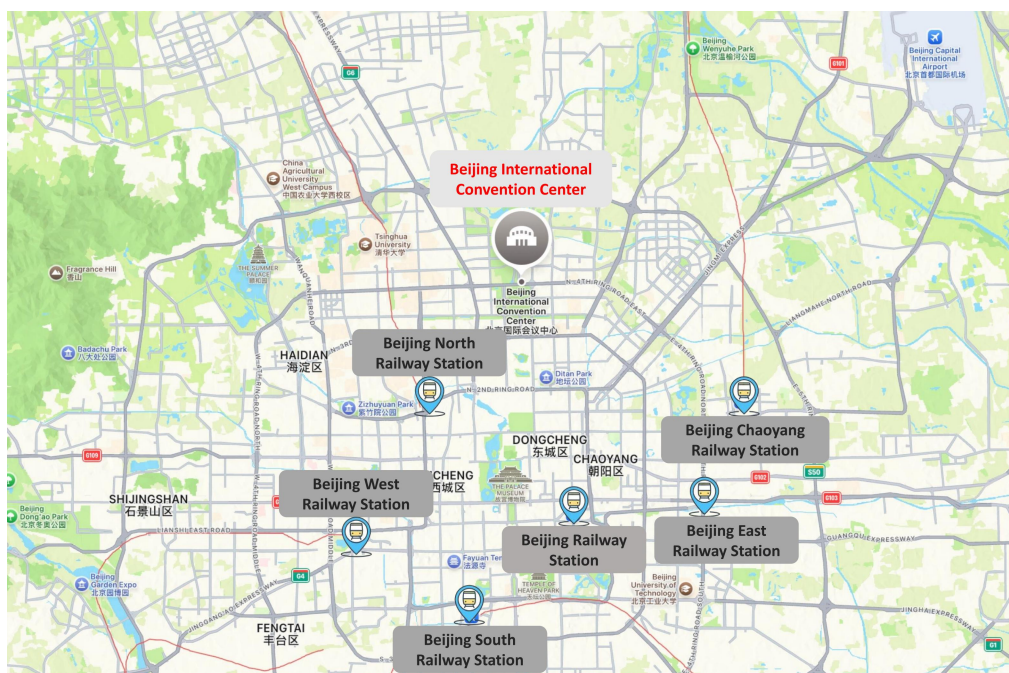
CONTENTS

Participation Guidelines	P01
Committee	P05
Program at a Glance	P07
Plenary Talks	P10
Panel Discussion	P19
Keynote Sessions	P22
Invited Sessions & Regular Sessions	P62
Author Index	P85
Keyword Index	P92
Industrial Sponsors	P94
Organization Information	P99

Participation Guidelines

Conference Venue

Welcome to Beijing! Our conference will be held at the renowned Beijing International Convention Center (BICC), with the official delegate hotel, the Beijing Continental Grand Hotel (BCGH), conveniently located as part of the same complex.

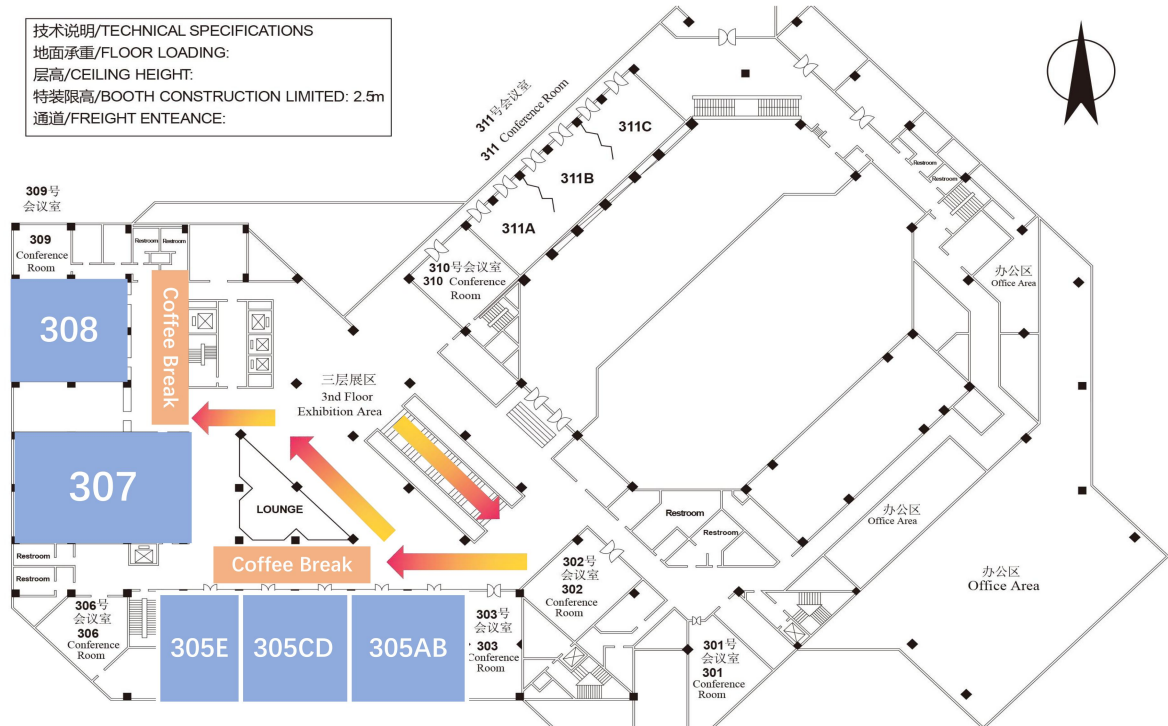


- Beijing Capital International Airport: About 24 km, 36 minutes drive.
- Beijing North Railway Station: About 11 km, 19 minutes drive.
- Beijing Railway Station: About 14 km, 32 minutes drive.
- Beijing South Railway Station: About 20 km, 43 minutes drive.
- Beijing Daxing International Airport: About 68 km, 150 minutes drive.
- Beijing Chaoyang Railway Station: About 13 km, 21 minutes drive.
- Beijing East Railway Station: About 17 km, 31 minutes drive.
- Beijing West Railway Station: About 18 km, 34 minutes drive.

Participation Guidelines

On-Site Participation Guidelines

Meeting Space Overview (3F)



Meeting Room

Beijing International Convention Center (BICC)

2F (Convention Hall NO.2)

3F (305E, 305CD, 305AB, 307, 308)

Lunch Place

Beijing Continental Grand Hotel (BCGH), 2F Grand Ballroom

Participation Guidelines

Online Participation Guidelines

Meeting Name	Meeting ID	Passcode
IFAC HMS 2025 (2F, Convention Hall No.2)	893 7094 7685	2025112F
IFAC HMS 2025-Room 1 (307)	875 8091 6208	3F3070
IFAC HMS 2025-Room 2 (305CD)	847 3768 6044	3F305C
IFAC HMS 2025-Room 3 (305E)	835 9294 2805	3F305E
IFAC HMS 2025-Room 4 (305AB)	842 3539 6876	3F305A
IFAC HMS 2025-Room 5 (308)	876 4993 3416	3F3080

Conference Information



Conference Program



Cloud Album

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Zeng-Guang Hou	Institute of Automation, Chinese Academy of Sciences
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Frederic Vanderhaegen	The Université Polytechnique Hauts-de-France
Balint Varga	Karlsruhe Institute of Technology
Cong Wang	Shandong University
Jonathan Zhang	Tsinghua University

Program at a Glance

Nov 17, (Monday)

14:00-20:00	Registration	BICC, 1F
18:30-20:30	Welcome Reception	Beijing Continental Grand Hotel 2F Grand Ballroom

Nov 18, (Tuesday)

Opening Ceremony & Plenary Talk Chair: Zeng-Guang Hou, Institute of Automation, Chinese Academy of Sciences

08:00-18:00	Registration	BICC, 1F
08:00-18:00	Exhibition	BICC, 2F
08:30-09:00	Opening Ceremony	
09:00-09:45	Plenary Talk 1: Lei Guo, Beihang University	2F, Convention Hall No.2
09:45-10:30	Plenary Talk 2: Frederic Vanderhaegen, The Université PolytechniqueHauts-de-France	
10:30-10:45	Coffee Break	2F, Hall
10:45-11:30	Plenary Talk 3: Yildiray Yildiz, Bilkent University	2F, Convention Hall No.2
11:30-13:30	Lunch	Beijing Continental Grand Hotel 2F Grand Ballroom
13:30-15:30	TuSeA-Keynote Session A: Editors-in-Chief Forum	Room1: 3F, 307
	Paper Selection Session TuSeA-Session-A1: Young Author Prize Evaluation Session	Room 2: 3F, 305CD
	Invited Session TuSeA-Session-A2: Task Assignment, Path Planning, and Control for Multiple Autonomous Robots	Room 3: 3F, 305E
	Invited Session TuSeA-Session-A3: Design, Perception, and Control of Wearable Robots	Room 4: 3F, 305AB
	Invited Session TuSeA-Session-A4: AI-Based Image Perception and Intelligent Recognition	Room 5: 3F, 308
15:30-16:00	Coffee Break	3F, Hall
16:00-18:00	TuSeB-Keynote Session B: Frontiers in Human-Computer Interaction and Intelligent Systems	Room1: 3F, 307
	Paper Selection Session TuSeB-Session-B1: Best Paper Award Evaluation Session	Room 2: 3F, 305CD
	Regular Session TuSeB-Session-B2: Biomedical Signal Analysis for Motor Function Assessment and Restoration	Room 3: 3F, 305E
	Regular Session TuSeB-Session-B3: Design of Human-Machine Systems for Driving, Assistance, and Rehabilitation	Room 4: 3F, 305AB
	Regular Session TuSeB-Session-B4: Machine Learning in Vision and Recognition with Human-Computer Interaction	Room 5: 3F, 308
18:00-20:00	Dinner	Beijing Continental Grand Hotel 2F Grand Ballroom

Program at a Glance

Nov 19, (Wednesday)

Plenary Talk Chair: Frederic Vanderhaegen, The Université Polytechnique Hauts-de-France

08:00-18:00	Registration	BICC, 1F
08:00-18:00	Exhibition	BICC, 2F
08:00-08:45	Plenary Talk 4: Kyoungchul Kong, Korea Advanced Institute of Science and Technology	2F, Convention Hall No.2
08:45-09:30	Plenary Talk 5: Guang-Ren Duan, Harbin Institute of Technology	
09:30-09:45	Coffee Break	2F, Hall
09:45-10:30	Plenary Talk 6: Pramod P Khargonekar, University of California	2F, Convention Hall No.2
10:30-11:30	Panel Discussion: Human-Machine Co-evolution in the AI Age	
11:30-13:30	Lunch	Beijing Continental Grand Hotel 2F Grand Ballroom
13:30-15:30	WeSeA-Keynote Session A: Optimization and Control of Autonomous Intelligent Systems	Room1: 3F, 307
	Invited Session WeSeA-Session-A1: Adaptive Cooperative and Haptic Shared Control Systems	Room 2: 3F, 305CD
	Invited Session WeSeA-Session-A2: Modeling and Control Theory of Complex Systems	Room 3: 3F, 305E
	Invited Session WeSeA-Session-A3: Robotic Tactile Sensing and Interaction	Room 4: 3F, 305AB
	Invited Session WeSeA-Session-A4: Learning, Control and Applications of Robots	Room 5: 3F, 308
15:30-16:00	Coffee Break	3F, Hall
16:00-18:00	WeSeB-Keynote Session B: Innovative Applications of Intelligent Robots	Room1: 3F, 307
	Regular Session WeSeB-Session-B1: Advanced Control and Path Planning in Autonomous Systems	Room 2: 3F, 305CD
	Regular Session WeSeB-Session-B2: Model-Based Design and Analysis for Robotic Systems	Room 3: 3F, 305E
	Regular Session WeSeB-Session-B3: Perception, Prediction, and Safety in Autonomous Systems	Room 4: 3F, 305AB
19:00-22:00	Regular Session WeSeB-Session-B4: Advanced Modeling and Control for Mechatronic Systems with Human-Machine Collaboration	Room 5: 3F, 308
	Banquet and Awards	2F, Convention Hall No.2

Program at a Glance

Nov 20, (Thursday)

Plenary Talk Chair: Jianhua Zhang, Oslo Metropolitan University

08:00-18:00	Registration	BICC, 1F
08:00-18:00	Exhibition	BICC, 2F
09:00-09:45	Plenary Talk 7: Shane Xie, University of Leeds	2F, Convention Hall No.2
09:45-10:30	Plenary Talk 8: MengChu Zhou, New Jersey institute of Technology	
10:30-10:45	Coffee Break	2F, Hall
10:45-11:30	Plenary Talk 9: Jennie Si, Arizona State University	2F, Convention Hall No.2
11:30-13:30	Lunch	Beijing Continental Grand Hotel 2F Grand Ballroom
13:30-15:30	ThSeA-Keynote Session A: Advanced Control Theory and Embodied Intelligence	Room1: 3F, 307
	Invited Session ThSeA-Session-A1: Advancing Human-Machine Systems through Brain-Computer Interfaces	Room 2: 3F, 305CD
	Regular Session ThSeA-Session-A2: Neurophysiological Signal Processing and Human Movement Analysis	Room 3: 3F, 305E
	Regular Session ThSeA-Session-A3: Human-Robot Collaboration and Human-AI Interaction Systems	Room 4: 3F, 305AB
	Regular Session ThSeA-Session-A4: Intelligent Decision Support and Fault Diagnosis Systems	Room 5: 3F, 308
15:30-16:00	Coffee Break	3F, Hall
16:00-18:00	ThSeB-Keynote Session B: Artificial Intelligence and Intelligent Computing	Room1: 3F, 307
	Invited Session ThSeB-Session-B1: Human Performance and Cognitive Modeling in AI-Enabled Human-Machine Systems	Room 2: 3F, 305CD
	Regular Session ThSeB-Session-B2: Decoding and Control Methods in Brain-Computer Interaction	Room 3: 3F, 305E
	Regular Session ThSeB-Session-B3: Cognitive State Analysis and Human Performance Evaluation	Room 4: 3F, 305AB

Nov 21, (Friday)

08:00-18:00	Social Events	/
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Plenary Talk 1

Bionic Intelligent Control Technology of Unmanned Systems

Location: 2F, Convention Hall No.2 Time: Nov 18, (Tuesday), 09:00-09:45



Lei Guo

Beihang University

Abstract

The technical challenge of the unmanned system lies in the application barrier of "preset task, ideal environments, and fixed modes". The accurate, reliable, and autonomous control in "extremely dangerous (dangerous, extreme, special, and harsh) environments is of utmost importance. In the presence of disturbances and uncertainties, the intelligence of the biological and unmanned systems is considered as survivability under strong constraints. Based on the refined anti-disturbance control theory, this presentation includes the research framework of the bionic intelligent control theory and technology of unmanned systems, especially under disturbance and uncertainty environments. This presentation also discusses the multidisciplinary fields of bionic science, intelligent science, and control science from the perspectives of methodology, cybernetics, and behavior theories. Simultaneously, the underlying concept of bionic control technology of unmanned systems such as safety control, green control and evolution control is presented. In addition, some new research progress of bionic intelligent technology is introduced.

Biography

Professor Lei Guo was born in Qufu, China, in 1966. He received the B.S. degree and the M.S. degree from Qufu Normal University, in 1988 and 1991, respectively, and the Ph.D. degree from Southeast University, Nanjing, China, in 1997. Currently, he is a Distinguish Professor and Director of the Space Intelligent Control Research Center at Beihang University, Beijing, China.

He is an Academician of the Chinese Academy of Sciences (CAS), a Fellow of IEEE, IET, Chinese Association of Automation (CAA), and China Association of Inventions (CAI). He is the Director of the Navigation, Guidance and Control Committee of the CAA, the leader of both the Innovation Team of the Ministry of Education and of the Ministry of Science and Technology of China. His research interests include anti-disturbance control theory and applications, autonomous navigation and control technology of unmanned systems. He has published more than 480 papers, 7 monographs, and has more than 180 authorized invention patents. He was the recipient of the National Science Fund for Distinguished Young Scholars (2009), the National Nature Science Awards (2013), National Technology Invention Awards (2018), National Pioneer Innovation Award (2023) of China. He also obtained the Gold Medal of International Exhibition of Inventions of Geneva, Nuremberg and Turkey for the studies on bio-inspired navigation sensor, compound-eye-inspired navigation systems and biomimetic flying robots, respectively.

Plenary Talk 2

Responsible Human-AI Symbiosis: Dream or Reality?

Location: 2F, Convention Hall No.2 Time: Nov 18, (Tuesday), 09:45-10:30



Frederic Vanderhaegen

The Université Polytechnique
Hauts-de-France

Abstract

Artificial intelligence (AI) can be defined as any technical support with a minimum level of intelligence, capable of perceiving, interpreting, evaluating, or controlling situations or their evolution, learning from them, or creating solutions to deal with new situations. The concept of Responsible Artificial Intelligence (RAI) has produced different reports over the world in order to define features that an Artificial Intelligence based tool has to respect. However, it is an abusive wording because it is rather related to the responsibility of the designer or user of such system. Moreover, paradigms about Industry 5.0 or Operator 5.0 emphasize the importance of the human and organizational factors by focusing on human well-being, the symbiosis between humans and technical systems and the resilience of socio-technical systems.

The talk will show that both concepts, i.e. RAI and symbiosis are linked. It will present different ambitious features for RAI like transparency, accountability, inclusiveness, resilience or privacy. The expectations behind the concept of symbiosis are the benefits brought by the use of AI based tool. However, several examples show that sometimes such safety systems can lead to unsafe situations. Therefore, different ways of research are suggested and discussed in order to make humans and RAI evolve positively by considering human supported by RAI and RAI supported by human.

Biography

F. Vanderhaegen has a doctorate on Human and Industrial Automation. He was researcher at the National French Scientific Research Center (C.N.R.S.) from 1995 to 2005. He is Professor at the High School of Engineering on Applied sciences (INSA) of the Université Polytechnique Hauts-de-France (in Valenciennes, France) since 2005. He was the head of the Human-Machine Systems research team of the Laboratory of Industrial and Human Automation control, Mechanical engineering and Computer Science from 2004 to 2014. He co-chairs the Technical Committee on Human-Machine Systems of the International Federation on Automatic Control. He chairs the Research Group on Integrated Automation and Human-Machine systems (GRAISyHM). He co-chairs the research pole on Human Factor, Cognitive Engineering and Social Sciences (HORTENS) of the European Railway Research Network of Excellence (EURNEX) and his is co-editor-in-chief of Cognition Technology & Work journal. He is chairing several national and international projects (e.g., European projects from FP5, FP6, FP7, H2020; National projects with the National Research Agency) and conferences (e.g. IFAC/IFIP/IFORS/IEA symposia on Human-Machine Systems; International Conference on Mobility, Artificial Intelligence & Health; International Conference on Responsible Artificial Intelligence & Data Science; National Conference on Ergonomics & Artificial Intelligence, etc.). He is a member of the International Chair on Data Science and Explainable Artificial Intelligence. He is on the list of Stanford University World's Top 2% Scientist. His current research topics relate to human reliability, cooperation, learning, artificial intelligence, resilience engineering, human-systems inclusion and human-machine systems.

Plenary Talk 3

Keeping Humans Relevant and Safe: Designing AI for Collaboration, Not Replacement

Location: 2F, Convention Hall No.2 Time: Nov 18, (Tuesday), 10:45-11:30



Yildiray Yildiz

Bilkent University

Abstract

AI is accelerating faster than our ability to predict its impacts, raising legitimate concerns about human relevance, safety, and agency. An effective way to address the uncertainty created by the unprecedented pace of AI progress is to adopt a direction that puts humans at the center of the design process. This necessity places the field of Cyber-Physical-Human Systems (CPHS) at the forefront. CPHS integrate the physical system, the cyber layer (sensing, computation, control, communication), and the human element into a single system, with human well-being as the top priority.

To achieve high-performing, safe, and beneficial-to-human CPHS, we first need reliable mathematical human models. In the first part of my talk, I will present validated human models that capture attention and memory dynamics, adaptation, and strategic interaction with other intelligent agents. These models are grounded in rigorous control theory, game theory, and well-established cognitive psychology principles. In the second part, I will explain how these models are used to design human-AI collaboration mechanisms that are high performing and safe by design. The overall goal is clear: AI that collaborates with humans instead of replacing them to improve system performance and advance human well-being.

Biography

Yildiray Yildiz is an Associate Professor of Mechanical Engineering at Bilkent University and Director of the Systems Laboratory. He received the B.S. degree (valedictorian) in Mechanical Engineering from Middle East Technical University (Türkiye) in 2002; the M.S. degree in Mechatronics Engineering from Sabanci University (Türkiye) in 2004; and the Ph.D. degree in Mechanical Engineering with a Mathematics minor from the Massachusetts Institute of Technology (MIT), in 2009. He held Postdoctoral Associate (2009-2010) and Associate Scientist (2010-2014) positions at NASA Ames Research Center.

His research spans the theory and applications of system dynamics and control, with emphasis on human-machine interactions, adaptive control, reinforcement learning and game theory, and engineering applications in the aerospace and automotive domains. He is the recipient of the ASME Best Student Paper in Conference Award (2008), a NASA Group Achievement Award for outstanding technology development (2012), the Turkish Science Academy Young Scientist Award (2017), the Science Academy, Türkiye's Young Scientist.

Plenary Talk 4

Toward Seamless Physical Human–Robot Integration: Advances in Wearable Robotics

Location: 2F, Convention Hall No.2 Time: Nov 19, (Wednesday), 08:00-08:45



Kyoungchul Kong

Korea Advanced Institute of
Science and Technology

Abstract

As robots become increasingly integrated into human life, methods for physical human–robot interaction have advanced significantly. In wearable robotics, where the human and robot are mechanically coupled, the requirements for safety, comfort, and responsiveness are particularly stringent because users continuously perceive the interaction forces. These interactions extend beyond joint torque assistance and also include rehabilitation training, haptic feedback, and power augmentation for load-bearing tasks.

To meet such demands, compact yet highly capable systems are emerging. Modern microprocessors are replacing traditional control architectures by embedding real-time motion control algorithms such as nonlinearity compensation, trajectory generation, and multi-loop feedback directly into motor drivers, which reduces dependence on high-performance computers.

At the same time, artificial intelligence is increasingly integrated into control frameworks to bridge the simulation-to-reality gap, thereby improving adaptability and efficiency. This plenary talk will discuss recent advances in hardware and software architectures that enable sophisticated physical human–robot interaction, with a focus on wearable robotics. Practical examples will illustrate how these developments are transforming design, control, and user experience.

Biography

Prof. Kyoungchul (KC) Kong received his B.Eng. degree (summa cum laude) in mechanical engineering, a B.S. degree in physics in 2004, and an M.S. degree in mechanical engineering in 2006 from Sogang University, Seoul, Korea, and a Ph.D. degree in mechanical engineering from the University of California at Berkeley, CA, USA, in 2009.

In 2011, he joined the Department of Mechanical Engineering, Sogang University, as an assistant professor. He is currently a professor of the Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology (KAIST). He is a founder and the chairman (formerly CEO) of Angel Robotics, a spin-off company for productizing wearable robots, which is KOSDAQ listed.

Prof. Kong received the Best Innovation Award from the President of Korea in 2017, the Commendation by the Minister of Commerce, Industry and Energy in 2017, the Gold Medals of Cybathlon 2020 and 2024, the KAISTian of the year in 2025, and many others.

Plenary Talk 5

Fully Actuated System Approach: A New Framework for Dynamical System Control

Location: 2F, Convention Hall No.2 Time: Nov 19, (Wednesday), 08:45-09:30



Guang-Ren Duan

Harbin Institute of Technology

Abstract

It is well-known that physical fully actuated systems (FASs) are a perfect type of systems in the sense that their controllers can be easily designed and the resulted closed-loop systems can often be made globally constant linear. A non-FAS is a system that is either a physical under-actuated system (UAS) or a system that cannot be classified into a FAS or UAS. If, by any chance, a non-FAS can be converted into a FAS, then the control design of all non-FASs can be systematically solved. However, under the traditional definitions and physical restrictions, this goal is not practical and in general not achievable. Fortunately, a recently significant achievement on the discovery of the mathematically generalized FAS model of dynamical systems made an important milestone toward this goal. Although a non-FAS cannot be converted into a physical FAS, it can often be converted into a mathematically generalized FAS. Moreover, like a physical FAS, the control of a mathematically generalized FAS can also be easily realized. Such facts and logic naturally motivate the so-called FAS approach that solves control systems design based on generalized FAS models. In this talk, the backgrounds and the development of the FAS approach are briefly outlined, with an emphasis laid on sub-FAS and unidirectionally connected FAS models, sub-stabilization theory and the FAS approach for strict-feedback systems and nonholonomic systems, together with some practical applications.

Biography

Guang-Ren Duan is Fellow of CAA, IEEE, IFAC and IET, and Academician of the Chinese Academy of Sciences. He received his Ph.D. in Control Science and Engineering from Harbin Institute of Technology (HIT), Harbin, P. R. China, in 1989. After a two-year post-doctoral experience at the same university, he became professor of control systems theory at HIT in 1991. He visited the University of Hull, the University of Sheffield, and also the Queen's University of Belfast, UK, from December 1996 to October 2002. He is the founder and presently the Director of the Center for Control Theory and Guidance Technology at HIT. In 2021, he also established the automation faculty at the Southern University of Science and Technology (SUSTech), Shenzhen, China, and is presently serving as the dean for the School of Automation and Intelligent Manufacturing at SUSTech.

He is the author and co-author of five books and over 600 SCI-indexed publications. His research interests include both linear and nonlinear control, and their applications in spacecraft, robotics. He founded the TC on Fully Actuated System Approach, IEEE SMC Society, and has been general chairs for several international conferences including the 23rd IFAC Symposium on Automatic Control in Aerospace, and has been invited to give plenary talks at more than 40 international conferences, including IFAC TDS 2021, IEEE ARM 2020, IEEE ICRA 2021, IEEE IECON 2023, SICE-ICASE 2006, SICE 2014, CCC 2021, and CAC 2024. He is ranked No.1 in the subfield of Industry Engineering and Automation in the Elsevier-Stanford "World's Top 2% Scientists" program by Single Recent Year Scientific Impact (2025).

Plenary Talk 6

Human-Machine Collaboration in the AI Era: Vision and Future Directions

Location: 2F, Convention Hall No.2 Time: Nov 19, (Wednesday), 09:45-10:30



Pramod P Khargonekar

University of California

Abstract

The principal goal of this talk is to articulate a vision of the future of human-machine collaboration in the era of intelligent machines. In many application domains, machine learning and artificial intelligence techniques are transforming cyber-physical systems. These include manufacturing, robotics, and transportation. In the last three years, in addition to the more traditional analytic and predictive machine learning, newer generative AI techniques are playing a much more prominent role. In this talk, I will begin with a description of the key emerging concepts that are central to the notion of intelligent machines: physical AI, cognitive cyber-physical systems, and autonomous systems and inter-relationships between these. This will be followed by a detailed discussion of automation and autonomy from the perspective of human-machine collaboration. I will then discuss how we can draw on ideas from cognitive science and neuroscience for new directions to enable human-machine collaboration as machines embody increasing levels of autonomy and intelligence.

Biography

Pramod Khargonekar was Chair of the Department of Electrical Engineering and Computer Science from 1997 to 2001 and held the position of Claude E. Shannon Professor of Engineering Science at the University of Michigan. From 2001 to 2009, he was Dean of the College of Engineering and Eckis Professor of Electrical and Computer Engineering at the University of Florida till 2016. After serving briefly as Deputy Director of Technology at ARPA-E in 2012-13, he served the head of the Directorate of Engineering at the National Science Foundation from 2013 till June 2016. He was Vice Chancellor for Research and Distinguished Professor of Electrical Engineering and Computer Science at the University of California, Irvine, from 2016 to 2025, where is currently Distinguished Professor of Electrical Engineering and Computer Science. He has received numerous honors and awards including IEEE Control Systems Award, IEEE Baker Prize, IEEE Control Systems Society Bode Lecture Prize, IEEE Control Systems Society Axelby Award, NSF Presidential Young Investigator Award, AACC Eckman Award, Distinguished Alumni and Distinguished Service Awards from IIT Bombay, and Inaugural Hall-of-Fame Inductee, Electrical and Computer Engineering Department, University of Florida. He is a Fellow of IEEE, IFAC, and AAAS.

Plenary Talk 7

Advanced Robotics for Effective Stroke Rehabilitation Treatment in Home Environment

Location: 2F, Convention Hall No.2 Time: Nov 20, (Thursday), 09:00-09:45



Shane Xie

University of Leeds

Abstract

Stroke and neurological diseases have significant impact on our society, robotic technologies have shown potential for delivering effective care and presented many opportunities for the healthcare industry. The talk will cover the recent development of robotics for stroke rehabilitation, the research gaps and the need for new technologies in neuroscience, robotics and artificial intelligence. The talk will introduce a EPSRC-funded project on intelligent reconfigurable exoskeletons tailored to meet patients' needs, deliver effective diagnosis and personalised treatment, and monitored remotely by rehabilitation therapists. Examples of some of the current ongoing research work at the Leeds Centre for Assistive/Rehabilitation Robotics will be presented including pneumatic Peano muscle, DEA, soft exoskeleton, bilateral robot, neuromuscular and brain computer interfaces. The focus is on the enabling technologies for those whose strength and coordination have been affected by amputation, stroke, spinal cord injury, cerebral palsy and ageing.

Biography

Prof Shane (Sheng Q) Xie, Ph.D., FRSNZ, FEngNZ, FIEEE, FASME, FIMechE and FAAIA, is the Chair of Robotics and Autonomous Systems and Director of the Rehabilitation Robotics Lab at the University of Leeds, and he was the Director of the Rehabilitation and Medical Robotics Centre at the University of Auckland, New Zealand (NZ, 2002-2016). He has >30 years of research experience in healthcare robotics and exoskeletons. He has published > 500 refereed papers and 8 books in rehabilitation exoskeleton design and control, neuromuscular modelling, and advanced human-robot interaction. He has supervised >15 postdocs, 100 PhDs and 80 MEs in his team with funding of >£30M from five countries since 2003. His team has invented three award-winning rehabilitation exoskeletons. He is an expert in control of exoskeletons, i.e. impedance control, adaptive control, sliding mode control, and iterative learning control strategies. He has received many distinguished awards including the New Zealand Science Challenge Award, the David Bensted Fellowship Award, and the AMP Invention Award. He is an elected Fellow of Royal Society of New Zealand, Fellow of Engineering New Zealand, Fellow of IEEE, ASME, IMechE and AAIA. He was the Technical Editor for IEEE/ASME Transaction on Mechatronics, Associate Editor for Mechatronics Elsevier and Editorial member of many top journals in Mechatronics and Robotics.

Plenary Talk 8

Cross-Frequency Coupling Modeling: Unlocking Neural Oscillation Dynamics for EEG-based Brain-machine systems

Location: 2F, Convention Hall No.2 Time: Nov 20, (Thursday), 09:45-10:30



MengChu Zhou

New Jersey Institute of
Technology

Abstract

Cross-Frequency Coupling (CFC) occurring in the simultaneously active components of neural oscillations allows populations of neurons to interact and thus enables high-level cognitive functions. However, the complex and dynamic nature of CFC makes its quantification challenging. This talk introduces a novel CFC model and answers how it can be used to enhance decoding performance of EEG-based brain-computer interface (BCIs) in an efficient manner. We model rhythmic EEG oscillations as the sum of CFC components, thus capturing dynamic interactions associated with frequency bands, time, and spatial location. Our proposed model is verified in motor imagery paradigms and achieves a significant improvement in classification accuracy over the state-of-the-art methods. Our proposed method provides interpretable metrics that link oscillatory patterns to cognitive states, offering new insights into how multi-scale neural dynamics support action planning, motor control, and cognitive modulation. The talk will conclude with our perspectives on integrating CFC modeling into real-time, closed-loop Brain-machine systems for neurorehabilitation and cognitive augmentation.

Biography

MengChu Zhou received his B.S. degree in Control Engineering from Nanjing University of Science and Technology, Nanjing, China in 1983, M.S. degree in Automatic Control from Beijing Institute of Technology, Beijing, China in 1986, and Ph. D. degree in Computer and Systems Engineering from Rensselaer Polytechnic Institute, Troy, NY in 1990. He joined the Department of Electrical and Computer Engineering, New Jersey Institute of Technology in 1990, and is now a Distinguished Professor. His interests are in intelligent automation/transportation, robotics, Petri nets, Internet of Things, edge/cloud computing, and big data analytics. He has over 1400 publications including 17 books, over 900 journal papers including over 700 IEEE Transactions papers, 31 patents and 32 book-chapters. Dr. Zhou is presently Senior Editor of IEEE Transactions on Intelligent Transportation Systems, and Associate Editor of Research, IEEE Transactions on Industrial Informatics, IEEE Internet of Things Journal, and Frontiers of Information Technology & Electronic Engineering. He served as Editor-in-Chief of IEEE/CAA Journal of Automatica Sinica. He is founding Chair/Co-chair of Technical Committee on AI-based Smart Manufacturing Systems and Technical Committee on Humanized Crowd Computing of IEEE Systems, Man, and Cybernetics Society (SMC), Technical Committee on Semiconductor Manufacturing Automation of IEEE Robotics and Automation Society (RAS). He is a recipient of Franklin V. Taylor Memorial Award, Norbert Wiener Award and Lotfi A. Zadeh Pioneer Award from IEEE SMC Society, Excellence in Research Prize and Medal from NJIT, Humboldt Research Award for US Senior Scientists from Alexander von Humboldt Foundation, and Edison Patent Award from the Research & Development Council of New Jersey. He is Fellow of IEEE, International Federation of Automatic Control (IFAC), American Association for the Advancement of Science (AAAS), Chinese Association of Automation (CAA) and National Academy of Inventors (NAI).

Plenary Talk 9

Reinforcement Learning Control of Wearable Robots: From Theory to Human Experiments

Location: 2F, Convention Hall No.2 Time: Nov 20, (Thursday), 10:45-11:30



Jennie Si

Arizona State University

Abstract

While reinforcement learning (RL) has achieved remarkable success in simulation-intensive applications, its potential to advance control theory and effectively address real-world physical control problems remains to be fully realized before widespread deployment. This talk focuses on a class of challenges arising from human wearable robots, which operate in direct, continuous physical contact with the human body. Due to strong dynamic coupling with human biomechanics, voluntary control, and neuromuscular variability, this human–robot interaction introduces pronounced non-stationarity and stringent safety constraints. As a result, wearable robots require continuous co-adaptation between the user and the device, where learning must account for online personalization and adaptive human–robot coordination. These challenges make wearable robot control considerably more complex than that of non-wearable robots, which typically optimize for task success without considering an adaptive human partner.

In this talk, I will present theoretical RL frameworks designed to enable effective and efficient offline-to-online RL control, addressing key design challenges including data inefficiency, solution bias and variance, and safety considerations in the context of personalized wearable robot control. I will also showcase experimental results from human studies, demonstrating successful RL controller designs tailored to specific application domains, including robotic prostheses, exoskeletons, and soft exosuits.

Biography

Dr. Jennie Si received the B.S. and M.S. degrees from Tsinghua University, Beijing, China, and the Ph.D. degree from the University of Notre Dame, Notre Dame, IN, USA. She has been a faculty member in the School of Electrical, Computer and Energy Engineering at Arizona State University, Tempe, AZ since 1991. Her research focuses on reinforcement learning control utilizing tools from optimal control theory, reinforcement learning and neural networks. Her recent work also involves optimal adaptive control of wearable robots.

One of her early contributions, direct Heuristic Dynamic Programming (dHDP), laid the groundwork for modern actor–critic methods. It learns the critic (Q-function) and actor (policy) directly from data, without a system model as in general adaptive critic design methods, enabling gradient-based control in continuous action spaces. Modern algorithms such as DDPG, TD3, and SAC extend the core principle of dHDP with replay buffers, target networks, twin critics, and entropy regularization to handle real-world, complex, and high-dimensional robotic control.

Dr. Si was a recipient of the NSF/White House Presidential Faculty Fellow Award in 1995 and the Motorola Engineering Excellence Award in the same year. She is a Distinguished Lecturer of the IEEE Computational Intelligence Society and an IEEE Fellow. She consulted for Intel, Arizona Public Service, and Medtronic. She has served on several professional organizations' executive boards and international conference committees. She was an Advisor to the NSF Social Behavioral and Economical Directory. She served on several proposal review panels. She is a past Associate Editor of the IEEE Transactions on Automatic Control, the IEEE Transactions on Semiconductor Manufacturing, the IEEE Transactions on Neural Networks and Learning Systems, and a past Action Editor of Neural Networks. She is a current Senior Editor of the IEEE Transactions on Neural Networks and Learning Systems.

Panel Discussion

Human-Machine Co-evolution in the AI Age

Location: 2F, Convention Hall No.2

Time: Nov 19, (Wednesday), 10:30-11:30



Jianhua Zhang, Oslo Metropolitan University

Biography

Jianhua Zhang is currently Professor in AI at Department of Computer Science, Oslo Metropolitan University, Norway. He received his PhD from Ruhr University Bochum, Germany and did postdoctoral research at the University of Sheffield, UK. Dr Zhang's recent research interests encompass bio-inspired AI and machine learning, cognitive human-machine systems, intelligent systems and control, biomedical signal processing, and neurocomputing. In those areas he has published 4 books, 13 book chapters, and more than 200 peer-reviewed journal and conference papers. Dr Zhang served as Chair of IFAC (International Federation of Automatic Control) Technical Committee on Human-Machine Systems (2017-2023) and Vice Chair of IEEE Norway Section (2019-2023). He currently serves as a Co-Chair of IFAC Technical Committee on Human-Machine Systems (2023-) and Vice Chair of IEEE CIS (Computational Intelligence Society) Norway Chapter (2019-). He was chair or invited speaker for several international conferences of IFAC and IEEE. For more details, check the webpage: <https://www.oslomet.no/en/about/employee/jianhuaz/>.



Takayuki Hirose, Japan Manned Space Systems Corporation / Kyoto University

Biography

Takayuki Hirose received his Ph.D. degree in Mechanical Engineering from Kyoto University, Japan, in 2020. He is currently a researcher at the Japan Manned Space Systems Corporation (JAMSS), a junior associate professor at the Center for Interdisciplinary Studies of Law and Policy at Kyoto University, and a Co-Chair of IFAC TC 4.1 on Human-Machine Systems. His research interests focus on the safety and resilience of complex socio-technical systems, particularly those involving human-machine interaction as well as organizational and environmental factors.



Takahiro Wada, Nara Institute of Science and Technology

Biography

Takahiro Wada received the Ph.D. degree in Robotics from Ritsumeikan University, Japan, in 1999. He is currently a Professor at Nara Institute of Science and Technology (NAIST), Japan, and leads the Human Robotics Laboratory. His research interests include human motion perception and modeling, motion sickness, physical human-robot interaction, and haptic shared control. He previously served as a Co-Chair of the IEEE SMC Technical Committee on Shared Control and is currently a Co-Chair of the IFAC TC 4.1 on Human-Machine Systems.

Panel Discussion

Human-Machine Co-evolution in the AI Age

Location: 2F, Convention Hall No.2

Time: Nov 19, (Wednesday), 10:30-11:30



Frederic Vanderhaegen, The Université Polytechnique Hauts-de-France

Biography

F. Vanderhaegen has a doctorate on Human and Industrial Automation. He was researcher at the National French Scientific Research Center (C.N.R.S.) from 1995 to 2005. He is Professor at the High School of Engineering on Applied sciences (INSA) of the Université Polytechnique Hauts-de-France (in Valenciennes, France) since 2005. He was the head of the Human-Machine Systems research team of the Laboratory of Industrial and Human Automation control, Mechanical engineering and Computer Science from 2004 to 2014. He co-chairs the Technical Committee on Human-Machine Systems of the International Federation on Automatic Control. He chairs the Research Group on Integrated Automation and Human-Machine systems (GRAISyHM). He co-chairs the research pole on Human Factor, Cognitive Engineering and Social Sciences (HORTENS) of the European Railway Research Network of Excellence (EURNEX) and his is co-editor-in-chief of Cognition Technology & Work journal. He is chairing several national and international projects (e.g., European projects from FP5, FP6, FP7, H2020; National projects with the National Research Agency) and conferences (e.g. IFAC/IFIP/IFORS/IEA symposia on Human-Machine Systems; International Conference on Mobility, Artificial Intelligence & Health; International Conference on Responsible Artificial Intelligence & Data Science; National Conference on Ergonomics & Artificial Intelligence, etc.), He is a member of the International Chair on Data Science and Explainable Artificial Intelligence. He is on the list of Stanford University World's Top 2% Scientist. His current research topics relate to human reliability, cooperation, learning, artificial intelligence, resilience engineering, human-systems inclusion and human-machine systems.



Pramod P Khargonekar, University of California

Biography

Pramod Khargonekar was Chair of the Department of Electrical Engineering and Computer Science from 1997 to 2001 and held the position of Claude E. Shannon Professor of Engineering Science at the University of Michigan. From 2001 to 2009, he was Dean of the College of Engineering and Eckis Professor of Electrical and Computer Engineering at the University of Florida till 2016. After serving briefly as Deputy Director of Technology at ARPA-E in 2012-13, he served the head of the Directorate of Engineering at the National Science Foundation from 2013 till June 2016. He was Vice Chancellor for Research and Distinguished Professor of Electrical Engineering and Computer Science at the University of California, Irvine, from 2016 to 2025, where is currently Distinguished Professor of Electrical Engineering and Computer Science. He has received numerous honors and awards including IEEE Control Systems Award, IEEE Baker Prize, IEEE Control Systems Society Bode Lecture Prize, IEEE Control Systems Society Axelby Award, NSF Presidential Young Investigator Award, AACC Eckman Award, Distinguished Alumni and Distinguished Service Awards from IIT Bombay, and Inaugural Hall-of-Fame Inductee, Electrical and Computer Engineering Department, University of Florida. He is a Fellow of IEEE, IFAC, and AAAS.

Panel Discussion

Human-Machine Co-evolution in the AI Age

Location: 2F, Convention Hall No.2

Time: Nov 19, (Wednesday), 10:30-11:30



Zhaoxiang Zhang, Institute of Automation, Chinese Academy of Sciences

Biography

Dr. Zhaoxiang Zhang received his BSc degree in Department of Electronic Science and Technology from University of Science and Technology of China, and the PhD degree in Pattern Recognition and Intelligent Systems from the Institute of Automation, Chinese Academy of Sciences in 2004 and 2009, respectively. From 2009 to 2015, he worked as a Lecturer, Associate Professor, and later the deputy director of Department of Computer Application Technology at the Beihang University. Since July 2015, Dr. Zhang has joined the Institute of Automation, Chinese Academy of Sciences, where he is currently a professor. His major research interests include pattern recognition, computer vision and machine learning. Recently, he specifically focuses on deep learning models, biologically-inspired visual computing and human-like learning, and their applications on human analysis and scene understanding. He has published more than 200 papers in international journals and conferences, including reputable international journals such as IEEE TPAMI, IJCV, JMLR, IEEE TIP, IEEE TCSVT, and top-level international conferences like CVPR, ICCV, NIPS, ECCV, ICLR, AAAI, IJCAI and ACM MM. He has won the best paper awards in several conferences and championships in international competitions and his research has won the 'Technical Innovation Award of the Chinese Association of Artificial Intelligence'. He has served as the PC Chair or area chair of many international conferences like CVPR, ICCV, AAAI, IJCAI, ACM MM, ICPR and BICS. He is serving or has served as associate editor of reputable international journals like IEEE T-PAMI, IJCV, IEEE T-CSVT, IEEE T-BIOM, Pattern Recognition and NeuroComputing.



Xiang Li, Tsinghua University

Biography

Xiang Li is an Associate Professor with the Department of Automation, Tsinghua University. His research interests include robotic dexterous manipulation and human-robot collaboration. He has published three monographs distributed by Springer and Elsevier and authored over 100 papers. He has been the Associate Editor of IJRR since 2024 and the Associate Editor of TRO since 2025. He received the IROS Best Application Paper Finalist in 2017, the ICRA Best Medical Robotics Paper Finalist in 2024, and the RAL Outstanding Associate Editor in 2025. He led the team and won the first place at 2024 ICRA Robotic Grasping and Manipulation Challenge – in-hand track and also the Most Elegant Solution across all the tracks.

TuSeA-Keynote Session A

Editors-in-Chief Forum

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 13:30-15:30

Session Chair: Wei Wang, Beihang University

13:30-13:50	Speaker 1: Haibin Duan, Beihang University Speech Title: Aim & Do—The Growth Journey of the Guidance, Navigation, and Control Journal
13:50-14:10	Speaker 2: Huajin Tang, Zhejiang University Speech Title: Introduction to IEEE Trans. on Cognitive and Developmental Systems
14:10-14:30	Speaker 3: Qinglai Wei, Institute of Automation, Chinese Academy of Sciences Speech Title: Reflections on International Journal Development and Paper Submission
14:30-14:50	Speaker 4: Dongrui Wu, Huazhong University of Science and Technology Speech Title: IEEE Trans. on Fuzzy Systems Status Update
14:50-15:10	Speaker 5: Zhixin Liu, Academy of Mathematics and Systems Science, Chinese Academy of Sciences Speech Title: An Overview and Vision of Control Theory and Technology
15:10-15:30	Speaker 6: Min Jiang, Xiamen University Speech Title: IEEE Computational Intelligence Magazine: From Results to Insight

Keynote Speakers

Editors-in-Chief Forum



Haibin Duan
Beihang University

Title

Aim & Do—The Growth Journey of the Guidance, Navigation, and Control Journal

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 13:30-13:50

Abstract

Guidance, Navigation, and Control (GNC) is a key frontier discipline supporting various major strategies. As the first high-quality international academic journal closely related to this field, Guidance, Navigation, and Control journal is building an international platform for this classic field. This report mainly focused on the Guidance, Navigation, and Control's development history, operational experience, and current development status, analyzing the inherent connection between the innovative development of the GNC field and the efficient dissemination of the journal, also discuss the key points for writing high-level papers in the GNC field.

Biography

Haibin Duan is currently a professor with the National Key Laboratory of Aircraft Integrated Flight Control, School of Automation Science and Electrical Engineering, Beihang University (BUAA), Beijing, China. He is a Fellow of Chinese Association of Automation (CAA).

He received the National Science Fund for Distinguished Young Scholars of China in 2014. He was also enrolled in the Chang Jiang Scholars Program of China in 2018, Scientific and Technological Innovation Leading Talent of "Ten Thousand Plan"-National High Level Talents Special Support Plan in 2017, and Top-Notch Young Talents Program of China in 2012, Program for New Century Excellent Talents in University of China in 2010, and Beijing NOVA Program in 2007.

He is the director of Technical Committee on Guidance Navigation and Control (TCGNC), Chinese Society of Aeronautics and Astronautics (CSAA), and the director of Technical Committee on Unmanned Aerial Systems Autonomous Control (TCUASAC), Chinese Association of Automation (CAA). He is the Editor-in-Chief of Guidance, Navigation and Control, Associate Editor of the IEEE Transactions on Cybernetics, and IEEE Transactions on Circuits and Systems I: Regular Paper. He has authored or coauthored more than 90 publications and 5 monographs. His current research interests are bio-inspired intelligence, and unmanned systems swarm autonomous control.

Keynote Speakers

Editors-in-Chief Forum



Huajin Tang
Zhejiang University

Title

Introduction to IEEE Trans. on Cognitive and Developmental Systems

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 13:50-14:10

Abstract

This talk introduces the positioning and scope of the IEEE TCDS journal from the Editor-in-Chief's perspective. TCDS as categorized in the citation report, primarily focuses on the three major fields: Computer Science-Artificial Intelligence, Neuroscience, and Robotics. It places a particular emphasis on cognitive and growth systems, highlighting its distinctive characteristics and academic positioning. Based on the perspective of the Editor-in-Chief of IEEE TCDS, this talk will provide an in-depth analysis of the journal's acceptance criteria, peer review standards, and submission recommendations for authors.

Biography

Huajin Tang received the Ph.D. degree from the National University of Singapore in 2005. He was an R&D Engineer with STMicroelectronics, Singapore from 2004 to 2006. From 2006, he was a Postdoc with Queensland Brain Institute, University of Queensland, Australia. From 2008-2015 he was the Lab Head of Robotic Cognition at the Institute for Infocomm Research (A*STAR) Singapore. Currently he is a Professor with College of Computer Science and Technology, Zhejiang University. He has received the 2016 Outstanding IEEE TNNLS Award and 2019 Outstanding IEEE CIM Paper Award., 2023 Neural Networks Best Paper Award、2024 APNNS Outstanding Achievement Award Prof. Tang is EIC for IEEE Trans. on Cognitive and Developmental Systems (TCDS), and a Board of Governor member of International Neural Networks Society (INNS) .

Keynote Speakers

Editors-in-Chief Forum



Qinglai Wei

Institute of Automation, Chinese Academy of Sciences

Title

Reflections on International Journal Development and Paper Submission

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 14:10-14:30

Abstract

This talk is to share the experience in international journal development and paper submission in the fields of artificial intelligence, systems science, and control engineering. Drawing from extensive editorial experience, including serving as senior editor/associate editor-in-chief of four journals, some insights will be shared on peer review management and points for paper submission. Practical strategies will be illustrated using the case studies from IEEE/CAA Journal of Automatica Sinica, IEEE Transactions on Systems, Man, and Cybernetics-Systems, and Neurocomputing, offering valuable guidance for researchers committed to advancing scholarly publishing.

Biography

Qinglai Wei received the B.S. degree in automation and the Ph.D. degree in control theory and control engineering from Northeastern University, Shenyang, China, in 2002 and 2009, respectively. From 2009 to 2011, he was a Postdoctoral Fellow with the State Key Laboratory of Management and Control for Complex Systems, Institute of Automation, Chinese Academy of Sciences, Beijing, China, where he is currently a Professor with the Institute of Automation. He has authored four books, and published over 80 international journal articles. His research interests include adaptive dynamic programming, neural networks-based control, optimal control, nonlinear systems, and their industrial applications.

Prof. Wei was a recipient of the IEEE/CAA Journal of Automatica sinica Best Paper Award, the IEEE System, Man, and Cybernetics Society Andrew P. Sage Best Transactions Paper Award, the IEEE Transactions on Neural Networks and Learning Systems Outstanding Paper Award, the Outstanding Paper Award of Acta Automatica Sinica, and the Zhang Siying Outstanding Paper Award of the Chinese Control and Decision Conference. He was also a recipient of the Shuang-Chuang Talents in Jiangsu Province, China, and the Young Researcher Award of Asia-Pacific Neural Network Society. He has been the Vice President of the IEEE Computational Intelligence Society's Beijing Chapter since 2022. He was the General Co-Chair of the 2019 Symposium of Parallel Intelligence, the Invited Session Chair of the IEEE 8th Data Driven Control and Learning Systems Conference, the Special Sessions Chair of the 25th International Conference on Neural Information Processing, the Program Co-Chair of the 24th International Conference on Neural Information Processing, and the Registration Chair of the 12th World Congress on Intelligent Control and Automation and the 2014 IEEE World Congress on Computational Intelligence. He was a Guest Editor for several international journals. He is an Associate Editor-in-Chief/the Deputy Editor-in-Chief of the IEEE/CAA Journal of Automatica Sinica, Neurocomputing, and Acta Automatica Sinica. He is also an Associate Editor of IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Consumer Electronics, IEEE Transactions on Cognitive and Developmental Systems, IEEE Transactions on Systems, Man, and Cybernetics: Systems, and Optimal Control Applications and Methods.

Keynote Speakers

Editors-in-Chief Forum



Dongrui Wu

Huazhong University of Science and Technology

Title

IEEE Trans. on Fuzzy Systems Status Update

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 14:30-14:50

Abstract

This talk will introduce the scope and status of IEEE Transactions on Fuzzy Systems.

Biography

Dongrui Wu (IEEE Fellow) received a B.E in Automatic Control from the University of Science and Technology of China, Hefei, China, in 2003, an M.Eng in Electrical and Computer Engineering from the National University of Singapore in 2006, and a PhD in Electrical Engineering from the University of Southern California, Los Angeles, CA, in 2009. He is now Professor and Vice Dean of School of Artificial Intelligence and Automation, Huazhong University of Science and Technology, Wuhan, China. His research interests include brain-computer interface, machine learning, computational intelligence, and affective computing. He has more than 200 publications (17000+ Google Scholar citations; h=67), with 8 outstanding paper awards. His team won National Champion of the China Brain-Computer Interface Competition three times (2021/2022/2024). He is the Editor-in-Chief of IEEE Transactions on Fuzzy Systems.

Keynote Speakers

Editors-in-Chief Forum



Zhixin Liu

Academy of Mathematics and Systems Science, Chinese Academy of Sciences

Title

An Overview and Vision of Control Theory and Technology

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 14:50-15:10

Abstract

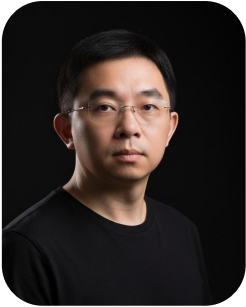
In this talk, we begin with an overview of the journal's founding mission to bridge theoretical advances and technological innovations. It highlights key milestones and showcases seminal contributions at the control theory and practice. Building on this foundation, the talk provides a detailed look at the current landscape of CTT. Finally, we will outline the journal's future vision, with a focus on emerging frontiers such as AI-driven control, autonomous systems, and cyber-physical security.

Biography

Zhixin Liu received the B.S. degree in mathematics from Shandong University in 2002, and the Ph.D. degree in control theory from Academy of Mathematics and Systems Science (AMSS), Chinese Academy of Sciences (CAS) in 2007. She is currently a professor of AMSS, CAS. She had visiting positions with the KTH Royal Institute of Technology, Sweden, University of New South Wales, Australia, and University of Maryland, College Park, USA. She serves as the Deputy Editors-in-Chief for Control Theory and Technology and Journal of Systems Science and Mathematical Sciences, and Associate Editor for journals such as Science China Information Sciences and IEEE Control Systems Letters. She is a coauthor of the SIGEST Paper in SIREV in 2014, and won the First Prize in Natural Sciences by Chinese Association of Automation (CAA), and the Young Scientist Award by CAA. Her current research interests include multiagent systems, distributed control, and distributed estimation and filtering.

Keynote Speakers

Editors-in-Chief Forum



Min Jiang

Xiamen University

Title

IEEE Computational Intelligence Magazine: From Results to Insight

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 15:10-15:30

Abstract

In the age of foundation models and ever-growing benchmarks, our community is exceptionally good at producing results. What we increasingly lack is a shared space for insight – a place where we step back from numbers and ask what these advances really mean for computational intelligence.

In this talk, I will introduce the role of the IEEE Computational Intelligence Magazine (CIM) as that space, and share my vision as its incoming Editor-in-Chief. Positioned alongside, but fundamentally different from, the IEEE Transactions journals, CIM is not a venue for another incremental algorithm. It is a magazine for ideas: for surveys that organize a field, perspectives that challenge assumptions, and application stories that turn complex systems into understandable principles.

I will discuss how CIM aims to move our community “from results to insight” in three ways: by translating technical progress into concepts that a broader CI audience can use; by highlighting cross-disciplinary themes such as AI-for-Science and trustworthy intelligent systems; and by creating new opportunities for researchers – especially younger colleagues – to shape the narrative of where CI is heading.

My hope is that after this session, you will not only understand what CIM stands for, but also feel inspired to make your own ideas part of its story.

Biography

Min Jiang is a Professor in the Department of Artificial Intelligence at Xiamen University, China. He will serve as the Editor-in-Chief of the IEEE Computational Intelligence Magazine starting from January 2026.

His research lies in computational intelligence, evolutionary optimization, and neuro-symbolic learning, with a particular focus on dynamic multi-objective optimization, multiphysics simulation and optimization, and efficient numerical methods for partial differential equations.

Prof. Jiang is especially interested in integrating learning-based and evolutionary techniques with physics-based modeling for complex scientific and engineering problems. He has published extensively in top journals and conferences, including IEEE Transactions on Evolutionary Computation, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Cybernetics, NeurIPS, AAAI, and IJCAI.

He also actively serves the research community and is the General Chair of MIND 2025, an international conference on machine intelligence and nature-inspired computing.

TuSeB-Keynote Session B

Frontiers in Human-Computer Interaction and Intelligent Systems

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 16:00-18:00

Session Chair: Shuangyi Wang, Institute of Automation, Chinese Academy of Sciences

16:00-16:20	Speaker 1: Aiguo Song, Southeast University Speech Title: Power Inspection Teleoperation Robot Technology and Applications
16:20-16:40	Speaker 2: Feiqi Deng, South China University of Technology Speech Title: Stabilization of Nonlinear Systems by Noise
16:40-17:00	Speaker 3: Xuguang Lan, Xi'an Jiaotong University Speech Title: Reflections on the Boundaries and Challenges of Embodied Intelligence
17:00-17:20	Speaker 4: Min Liu, Hunan University Speech Title: Intelligent SurgicalRobot Multimodal Perception
17:20-17:40	Speaker 5: Hong Cheng, University of Electronic Science and Technology of China Speech Title: Modeling, Learning and Cooperation for Human-Robot Systems
17:40-18:00	Speaker 6: Yongsheng Ou, Dalian University of Technology Speech Title: Research on Complex Skill Learning Methods for Embodied Intelligent Robots

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Aiguo Song
Southeast University

Title
Power Inspection Teleoperation Robot Technology and Applications

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 16:00-16:20

Abstract

Electric power inspection robots are crucial for ensuring the safe operation of energy facilities in the electric power system. Due to the complexity of the environments in which electric power facilities are located and the diversity of inspection tasks, electric power inspection robots face challenges such as difficult access to complex scenes, visual perception difficulties caused by complex working conditions, and the difficulty in completing uncertain and variable inspection tasks. This report analyzes the key technologies of electric power inspection robots, introduces the research work of the presenter's team, and discusses the applications of the core technological achievements in the inspection and maintenance of the electric power systems.

Biography

Prof. Song received the Ph.D degree in Measurement and Control from Southeast University, China in 1996. From 1996 to 1998, he was a post-doctor and associate researcher with the Intelligent Information Processing Laboratory, Southeast University. From 1998 to 2000, He was an associate Professor with the School of Instrument Science and Engineering, Southeast University. From 2000 to 2004, he was the Director of the Robot Sensor and Control Lab, Southeast University. From 2004 to 2020, he was the Dean and Professor with the School of Instrument Science and Engineering, Southeast University. He is currently the Chief Professor of the Southeast University and the Director of Robot Sensor and Control Laboratory, Southeast University. His interests concentrate on robot force/tactile sensors, teleoperation robot, power inspection robot, medicine robot and rehabilitation robot. He has published more than 400 peer reviewed journal papers, and 300+ papers have been indexed by SCIE, and Google Scholar cited time is 15000+. He received the best paper award more than 20 times. He is a member of Chinese Instrument and Control Association, IEEE senior member, Chair of IEEE Nanjing Section Robotics and Automation Society Chapter. He has served as Chair or Co-Chair of 60+ International Conference/Symposium. He was recipient of the China National Science Fund for Distinguished Young Scholars, and recipient of the second prize of the National Scientific and Technological Progress in 2017.

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Feiqi Deng

South China University of Technology

Title

Stabilization of Nonlinear Systems by Noise

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 16:20-16:40

Abstract

In this talk, a new type stability theorems for stochastic systems and its application to stochastic stabilization are introduced. Firstly, a new type of stability theorem for stochastic systems is introduced. Based on this stability theorem and its corollaries, stochastic stabilization and destabilization

by noise are further investigated. In the work, the local Lipschitz condition is weakened to the generalized local Lipschitz condition. The commonly used linear growth condition or one-side linear growth condition is weakened to the generalized one-side linear growth condition, which is local, variable and nonlinear, admits nearly arbitrary variability in the time and real nonlinearity in the state. As an application, a simple and direct design method is proposed for finding a noise strength $g(t;x)$ so that the added noise $g(t;x)dB(t)$ stabilizes an unstable stochastic system or destabilizes a stable one. A numerical example is presented at the end of the note to illustrate the usage and efficiency of the proposed design method of the note. Related development will be introduced.

Biography

Feiqi Deng received the Ph.D. degree in control theory and control engineering from South China University of Technology, Guangzhou, in June 1997. Since October 1999, he has been a professor with South China University of Technology. He is currently a senior member of IEEE, a fellow of CAA, a member of Technical Committee on Control Theory (TCCT), and now he is serving as the chair of the IEEE CSS Guangzhou Chapter, the director of the TCCT Technical Committee on Stochastic System Control, the vice editor-in-chief of Journal of South China University of Technology, and associated editor of Mathematical Modeling and Control etc. His main research interests include stability, stabilization and Control of complex systems, including time delay systems and stochastic systems etc. E-mail: aufqdeng@scut.edu.cn.

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Xuguang Lan
Xi'an Jiaotong University

Title

Reflections on the Boundaries and Challenges of Embodied Intelligence

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 16:40-17:00

Abstract

This talk provides a concise overview of the concept and current state of embodied intelligence, whose core principle lies in the natural interaction and co-evolution among robots, the physical environment, humans, and other robots. It highlights recent advances and key challenges in robotic behavioral intelligence within the physical world and critically examines the boundaries of embodied intelligence. Building on this, the talk proposes a self-evolving framework for embodied intelligence centered on an integrated “Perceive–Learn–Imagine–Act–Feedback” loop, aiming to enable more efficient and flexible designs of embodied intelligent systems. Specifically, we present methods for autonomous robotic operation and continual learning in unstructured environments based on visual commonsense reasoning through environment interaction. By integrating large multimodal models into human–robot interaction, our approach empowers robots to perform visual commonsense reasoning and execute autonomous tasks in dynamic, unstructured settings. Furthermore, the talk introduces world-model-driven bootstrapped model predictive control and imagination-guided decision-making using large models for multi-robot autonomous collaboration (robot–robot interaction).

Biography

Xuguang Lan is a Professor at the School of Artificial Intelligence. His research focuses on computer vision, robot learning, multi-agent games, and human–robot symbiotic collaboration.

Prof. Lan currently serves as Chair of the Committee on Symbiotic Robotics, Chinese Association of Automation (CAA); Council Member and Deputy Secretary-General of the Chinese Cognitive Science Society; Vice Chair of the Technical Committee on Cognitive Systems and Information Processing, Chinese Association for Artificial Intelligence (CAAI); and Vice Chair of the Technical Committee on Modeling and Simulation of Intelligent Unmanned Systems, Chinese Society for Simulation.

He has published over 100 papers in top-tier journals and conferences such as IEEE Transactions and ICML/ICLR/RSS, holds more than 30 authorized Chinese invention patents, and has co-authored one edited book. His research outcomes have been successfully applied in aerospace and aviation domains, earning him the CAA Award for Scientific and Technological Progress (First Prize) and the National Teaching Achievement Award (First Prize).

Prof. Lan serves on the editorial boards of international journals including IEEE Transactions on Neural Networks and Learning Systems etc. He has held leadership roles in major conferences, including Co-Program Chair of IEEE CYBER 2019 and ICIRA 2021, and General Chair of IEEE RCAR 2023 and ICIRA 2024. He is a Senior Member of IEEE.

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Min Liu

Hunan University

Title

Intelligent Surgical Robot Multimodal Perception

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 17:00-17:20

Abstract

The breakthrough and comprehensive intelligent transformation and upgrading of core technologies in high-end medical equipment such as surgical robots is a major national strategic task aimed at the forefront of world technology, major national needs, and people's lives and health. It provides decisive guarantee and strong support for breaking the technological monopoly of high-end digital medical equipment in Europe and America. The existing surgical robots lack an effective multimodal surgical target collaborative perception system, which seriously restricts their promotion and application in emergency response to major national emergencies such as national defense security and epidemic disasters. In response to the challenging issues mentioned above, this lecture provides an in-depth introduction to the basic principles and key methods of multimodal perception of surgical robots from preoperative, intraoperative to postoperative, and showcases some of the progress our team has made so far, providing important guarantees for reducing medical accidents in China.

Biography

Liu Min, a secondary professor at Hunan University and Party Committee Secretary of the School of Artificial Intelligence and Robotics, is a recipient of the National Science Fund for Distinguished Young Scholars and a Youth Yangtze River Scholar of the Ministry of Education. She serves as the lead scientist for the National Key R&D Program and a core member of the Innovative Research Group under the National Natural Science Foundation of China. Holding a bachelor's degree from Peking University and a Ph.D. from the University of California, Riverside, she is Vice Chairman of the Hunan Automation Society, Director of the Key Laboratory of Advanced Manufacturing Vision Inspection and Control Technology in the Machinery Industry, and Deputy Director of the Youth Working Committee of the China Image Graphics Association. She has led two National Key R&D Program projects and one key project under the National Natural Science Foundation of China. As the first or corresponding author, she has published over 50 papers in IEEE transactions and received five provincial and ministerial-level scientific awards.

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Hong Cheng

University of Electronic Science and Technology of China

Title

Modeling, Learning and Cooperation for Human-Robot Systems

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 17:20-17:40

Abstract

This presentation mainly focuses on the system modeling and learning of human-robot dynamical system in rehabilitation scenarios. The human-robot modeling methods are first introduced to achieve precise mathematical expression and precise modeling for the dynamic behavior of complex rehabilitation robot system, providing a basis for the design and control for the human-robot system. Then, the learning of human-robot system is given, which consists of perception learning, cognition learning and action learning. The dynamic learning method is applied to help the rehabilitation robot customize action execution based on human's immediate responses and operation needs, thereby optimizing the task performances. On this basis, several human-robot cooperation control strategies are introduced, which helps to ensure performances and comfort of the system.

Biography

Hong Cheng is a full professor at School of Mechanical and Electrical Engineering, University of Electronic Science and Technology of China. He was awarded the "Leading Talent in Science and Technology Innovation of National Ten Thousand Plan" in 2018. He is a Director of Center for Robotics, and Engineering Research Center of Human-Robot Intelligent Technologies and Systems. He is the dean of School of Mechanical and Electrical Engineering, the vice dean Artificial Intelligence Research Institute. He is a Honorary Chairman of Intelligent Rehabilitation Committee of Chinese Rehabilitation Medicine Association, and Ethics Committee of University of Electronic Science and Technology. His research interests include: artificial intelligence and robotics.

Keynote Speakers

Frontiers in Human-Computer Interaction and Intelligent Systems



Yongsheng Ou

Dalian University of Technology

Title

Research on Complex Skill Learning Methods for Embodied Intelligent Robots

Location: Room1: 3F, 307 Time: Nov 18, (Tuesday), 17:40-18:00

Abstract

Currently, most robots still have significant gaps in their mechanisms, perception, and control capabilities compared to humans, making it difficult for them to adapt to changing scenarios or tasks. In comparison, humans are more adept at processing missing, contradictory, or ambiguous information. Therefore, human-robot and environment integration is an important approach to addressing the lack of intelligence in robots. For complex scenarios, in-depth exploration of the theoretical and practical issues of robots under "human-in-the-loop" conditions is necessary, focusing on methods such as multi-modal perception, knowledge reasoning, and precise compliant control for robots. The main research contents include: (1) human operation intention understanding and behavior prediction in dynamic unstructured environment; (2) efficient migration and generalization technology of robot collaboration skills driven by knowledge reasoning; and (3) Human-machine collaborative compliance force control based on multi-mode information fusion.

Biography

Ou Yongsheng, professor in Dalian University of Technology. In 2011, he received the support of the 100 Talents Program of the Chinese Academy of Sciences, and was selected into the National "Ten Thousand Talents Program" in 2020. Experts of the 13th Five-Year Key Intelligent Robot Group of the Ministry of Science and Technology, key project evaluation expert of Natural Science Fund Committee, and evaluation expert of national Science and Technology Award plan. He has undertaken many national projects, such as key projects of the National Natural Science Foundation of China, national major research plan projects, and the 863 project of the Ministry of Science and Technology. His research won the 2016 Wu Wenjun Artificial Intelligence Technology Progress Award (ranked first), the 2018 Shenzhen Municipal Science and Technology Progress Award (ranked first), and the 2020 Guangdong Provincial Technology Invention Award (ranked first).

WeSeA-Keynote Session A

Optimization and Control of Autonomous Intelligent Systems

Location: Room1: 3F, 307 Time: Nov 19, (Wendesday), 13:30-15:30

Session Chair: Zhong Yin, University of Shanghai for Science and Technology

13:30-13:50	Speaker 1: Roymond Tong, The Chinese University of Hong Kong Speech Title: Intention-driven Soft Robotic Rehabilitation
13:50-14:10	Speaker 2: Lining Sun, Soochow University Speech Title: Multidisciplinary Integration Driving Innovation in Robotic Technology
14:10-14:30	Speaker 3: Changchun Hua, Yanshan University Speech Title: Intelligent Perception, Teleoperation, and Autonomous Control for Construction Machinery Systems system
14:30-14:50	Speaker 4: Li Chai, Zhejiang University Speech Title: Momentum-accelerated Average Consensus of Multi-agent Systems
14:50-15:10	Speaker 5: Zhaohui Jiang, Central South University Speech Title: Multi-modal Image Fusion Method Under Multi-source Degradation Interference
15: 10-15:30	Speaker 6: Bai-gen Cai, Beijing Jiaotong University Speech Title: Key Technologies and Application of Trustworthy Train Positioning based on BeiDou Navigation Satellite System (BDS) and Multi-sensor Fusion

Keynote Speakers

Optimization and Control of Autonomous Intelligent Systems



Raymond Tong

The Chinese University of Hong Kong

Title

Intention-driven Soft Robotic Rehabilitation

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 13:30-13:50

Abstract

The global challenge of ageing populations and rising stroke incidence demands innovative, scalable neurorehabilitation solutions. This presentation will explore the journey of developing and internationalizing smart robotic systems designed to meet this need. We will focus on a therapeutic technology: soft, biomimetic ExoMuscle sleeve and soft robotic fingers. These technologies moves beyond rigid exoskeletons by utilizing artificial muscles to provide active, multi-directional assistance for stroke survivors.

Clinical trial results demonstrate the system's significant impact on neurorehabilitation. In a controlled study involving subacute stroke patients, the BCI/EMG driven platform produced significant improvements in motor function recovery together with soft robotic systems.

Biography

Professor Raymond Tong is a Professor and Founding Chairman of the Department of Biomedical Engineering at The Chinese University of Hong Kong (CUHK). A recognized leader in rehabilitation engineering, he was elected as a Fellow of the American Institute for Medical and Biological Engineering (AIMBE) in 2022.

His research is dedicated to developing intelligent robotic systems for post-stroke rehabilitation and elder care. Professor Tong's team has created groundbreaking inventions, including the "Hand of Hope" rehabilitation robot—the first Hong Kong invention to win the Grand Prize at the Geneva International Exhibition of Inventions—and novel artificial muscles that have earned gold medals at the Nuremberg, Geneva and Silicon Valley International Invention Festivals. With a strong record of translating laboratory research into globally applicable solutions, his work exemplifies the innovation and international impact of intelligent systems technology in shaping the future of healthcare.

Keynote Speakers

Optimization and Control of Autonomous Intelligent Systems



Lining Sun
Soochow University

Title
Multidisciplinary Integration Driving Innovation in Robotic Technology

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 13:50-14:10

Abstract

Intelligent robots are experiencing explosive growth, emerging as a pivotal form of new quality productive forces and a key engine for the digital economy. This progress is fueled by the deep integration of artificial intelligence, the industrial internet, and big data, leading to breakthroughs in bionic structures, miniaturization, bio-electro-mechanical integration, and intelligent perception. This report focuses on the core theme of multidisciplinary integration driving innovation in robotic technology. It will showcase cutting-edge application achievements across industrial, medical, and micro-nano manufacturing fields. Furthermore, the report delves into strategic insights for building an open and collaborative industrial ecosystem. The ultimate goal is to leverage scientific and technological innovation to continuously enhance new quality productive forces, thereby injecting robust momentum into the modernization of our industrial systems.

Biography

Prof. Lining Sun, Dean of the School of Mechanical and Electrical Engineering at Soochow University and recipient of China's top academic honors—including the National Science Fund for Distinguished Young Scholars, Changjiang Distinguished Professorship, Ho Leung Ho Lee Prize, National Innovation Medal, and Leading Talent of the National High-Level Talents Program—has pioneered transformative research in advanced robotics spanning industrial, micro/nano, and medical domains. His quantified impact encompasses 236 SCI papers, 188 invention patents, 5 monographs, eight provincial/ministerial awards, and two second-class national awards (principal investigator).

Keynote Speakers

Optimization and Control of Autonomous Intelligent Systems



Changchun Hua
Yanshan University

Title

Intelligent Perception, Teleoperation, and Autonomous Control for Construction Machinery Systems system

Location: Room1: 3F, 307 Time: Nov 19, (Wendesday), 14:10-14:30

Abstract

Construction machinery forms a critical component of the equipment manufacturing industry and is extensively employed in resource extraction, industrial production, construction, and emergency rescue. This presentation first examines intelligent perception technologies for construction machinery systems, and proposes a human-machine interactive remote monocular-binocular adaptive tracking perception method. It then addresses the challenge of achieving highprecision teleoperation control under complex network conditions and demanding operational environments, and develops a highperformance master-slave control strategy. Finally, it explores perceptiondriven autonomous control for both singlemachine operations and coordinated multimachine systems, culminating in the development of an assisted autonomous singlemachine operation platform and an efficient multimachine collaborative framework.

Biography

Changchun Hua is a recipient of the National Science Fund for Distinguished Young Scholars, a Distinguished Professor of the Changjiang Scholars Program, the Young and middle-aged leading talents in science and technology innovation, Ministry of Science and Technology, the leader of the National Key R&D Program of China. He is a CAA/ IEEE Fellow. His research focuses on control and applications of nonlinear dynamical systems and the analysis and design of networked control systems. He has authored three English monographs and published over 300 SCI-indexed papers, which have been cited more than 10,000 times. He serves on the editorial boards of international journals including IEEE Transactions on Cybernetics, IEEE Transactions on Circuits and Systems II, and the International Journal of Control, Automation and Systems. He has received one Second Prize of National Natural Science Award of China and six first prizes from provincial/ministerial levels.

Keynote Speakers

Optimization and Control of Autonomous Intelligent Systems



Li Chai
Zhejiang University

Title
Momentum-accelerated Average Consensus of Multi-agent Systems

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 14:30-14:50

Abstract

Previous researches have shown that adding local memory can accelerate the consensus. It is natural to ask questions like what is the fastest rate achievable by the M -tap memory acceleration, and what are the corresponding control parameters. This talk introduces a set of effective and previously unused techniques to analyze the convergence rate of accelerated consensus with M -tap memory of local nodes and to design the control protocols. These effective techniques, including the Kharitonov stability theorem, the Routh stability criterion and the robust stability margin, have led to the following new results: 1) the direct link between the convergence rate and the control parameters; 2) explicit formulas of the optimal convergence rate and the corresponding optimal control parameters for $M \leq 2$ on a given graph; 3) the optimal worst-case convergence rate and the corresponding optimal control parameters for the memory $M \geq 1$ on a set of uncertain graphs. We show that the acceleration with the memory $M = 1$ provides the optimal convergence rate in the sense of worst-case performance. Several numerical examples are given to demonstrate the validity and performance of the theoretical results.

Biography

Li Chai received the BS degree in applied mathematics and the MS degree in control science and engineering from Zhejiang University, China, in 1994 and 1997, respectively, and the PhD degree in electrical engineering from the Hong Kong University of Science and Technology, Hong Kong, in 2002. From 2002 to 2007, he was at Hangzhou Dianzi University, China. He worked as a professor at Wuhan University of Science and Technology, China from 2008 to 2021. In 2022, he joined Zhejiang University, China, where he is currently a Qishi professor at the College of Control Science and Engineering. He has been a postdoctoral researcher or visiting scholar at Monash University, Australia, Newcastle University, Australia and Harvard University, USA. His research interests include distributed optimization, filter banks, graph signal processing, and networked control systems.

Professor Chai is the recipient of the Distinguished Young Scholar of the National Science Foundation of China. He has published over 100 fully refereed papers in prestigious journals and leading conferences. He has served as the associate editor of IEEE Transactions on Circuit and Systems II: Express Briefs, Control and Decision and Journal of Image and Graphs.

Keynote Speakers

Optimization and Control of Autonomous Intelligent Systems



Zhaohui Jiang

Central South University

Title

Multi-modal Image Fusion Method Under Multi-source Degradation Interference

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 14:50-15:10

Abstract

In complex environments, multi-source degradation such as illumination variations, haze, noise, and spatial misalignment severely limit the fusion quality of multi-modal images. To address this issue, the study focuses on the fusion problem under degraded conditions and proposes a detail-aware fusion strategy, a multi-exposure fusion method based on random walk, and a two-stage registration-fusion framework using diffusion models. Experimental results show that the proposed methods can effectively recover image details, suppress noise interference under various degradation conditions, and significantly improve the performance of subsequent detection and recognition tasks, providing new solutions for multi-modal visual fusion in complex environments.

Biography

Zhaohui Jiang, professor and doctoral supervisor at Central South University, Distinguished Professor of the Ministry of Education's "Changjiang Scholars Program", Leading Talents in Science and Technology Innovation of Hunan Province, and young scientist of the Chinese Association of Automation. He currently serves as the dean of the Department of Automation Science and Technology, focusing on teaching and research in intelligent measurement and perception, image processing, and pattern recognition. He is also a director of the China Society of Image and Graphics, vice chairman of the Application Professional Committee of the Chinese Association of Automation, and vice president of the Hunan Automation Society. He has presided over 20 projects, including the National Major Scientific Research Equipment of China, Industrial Internet Innovation and Development Project of the Ministry of Industry and Information Technology, General Program of the National Natural Science Foundation of China, and university-enterprise cooperation projects. He has published 1 monograph and over 100 academic papers, obtained 70 national invention patents, and received 5 special and first prizes in science and technology from provincial, ministerial, and national societies, as well as the individual award of the 13th invention and entrepreneurship award.

Keynote Speakers**Optimization and Control of Autonomous Intelligent Systems****Bai-gen Cai**

Beijing Jiaotong University

Title**Key Technologies and Application of Trustworthy Train Positioning based on BeiDou Navigation Satellite System (BDS) and Multi-sensor Fusion**

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 15:10-15:30

Abstract

In modern railway systems, the train operation control system plays a significant role in ensuring the safety, efficiency and environmental effect of the trains. However, existing train control systems like CTCS level 2 and level 3, under the Chinese Train Control System (CTCS) framework, may suffer from the train/infrastructure cooperation mode, with which the operation of the train control system may have to rely on track-side facilities, like Balises, track circuit, and the axle counter. The advanced next-generation train control systems, both in Europe and China, are designed to take advantages of new technologies and practices, where the satellite-based positioning by GPS, Galileo and BeiDou Navigation Satellite System (BDS) has been highly investigated. However, a train positioning solution only using the satellite navigation may fail to fulfil the critical safety requirement of the train control system, due to the signal unavailability, potential faults/failures, multi-path effect and the signal interference. Therefore, trustworthy train positioning using BDS and assistance sensors is of great necessity to realize “fail-safe” determination of the train’s running state and enable different location-based applications.

In this presentation, the architecture of an advanced train positioning system based on the integration of BDS with other assistant sensors is proposed, which enables the holographic perception of the train’s operational status over ordinary running state variables. Key technologies and applications based on multi-sensor-fusion-enabled trustworthy train positioning are introduced as follows.

- 1) Under a redundant Location Determination System (LDS) architecture that is compatible to the on-board train control system, the state estimation solution for multi-sensor integrated train positioning is investigated using the Bayesian filtering algorithm and specific fault tolerant strategies.
- 2) The automatic trackmap generation solution is presented considering the multi-resolution characteristics of the railway tracks. The design and development of a specific map-tool-chain is introduced with field tests and implementations in Qinghai-Tibet Railway.
- 3) The Train Integrity Monitoring (TIM) technique based on the real-time evaluation of the train length is investigated. With the integration of BDS, the novel safe End-of-Train (EoT) system architecture is designed and realized.

By utilizing the key technologies, the novel train control system has been developed. Both the simulation and field test illustrate the capability and advantages of the presented solution, which indicate great potentials in many other related applications in future intelligent railway systems.

Biography

Bai-gen Cai received the B.Sc., M.Sc. and Ph.D. degrees in Beijing Jiaotong University in 1987, 1990, and 2010, respectively. Since 1990, he has been a faculty member at School of Electronic and Information Engineering, Beijing Jiaotong University. He was a Visiting Scholar with the Ohio State University from 1998 to 1999. He is currently a professor and the Dean of the School of Automation and Intelligence, Beijing Jiaotong University. He is the leader of Laboratory of Satellite Navigation for Railway in Beijing Jiaotong University. His research interests include satellite-based positioning & navigation, multi-sensor information fusion, intelligent transportation system, intelligent traffic control, network and information security, and system modeling and simulation. He has published more than 180 books, book chapters and research papers in those areas. He holds several national and international cooperation research and development projects. Prof. Cai is CAA (Chinese Association of Automation) fellow, IEEE senior member, and IRSE (Institute of Railway Signal Engineers) member. He holds the position as technical committee member of Chinese Association of Automation on Process Control and Industrial Control System Information. He is also the technical committee member on Institute of Railway Signal Engineers China Section, and Communication and Signaling Chapter of China Railway Society. He won the National Prize for Progress in Science and Technology in 2017, Beijing Technological Invention Award in 2023 and 2024, and the first prize of Science and Technology Award of China Railway Society in 2014, 2019 and 2020.

WeSeB-Keynote Session B

Innovative Applications of Intelligent Robots

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 16:00-18:00

Session Chair: Long Cheng, University of Chinese Academy of Sciences

16:00-16:20	Speaker 1: Lianqing Liu, Shenyang Institute of Automation, Chinese Academy of Sciences Speech Title: Intelligence and Implementation Methods for Biosyncretic Robots
16:20-16:40	Speaker 2: Noman Naseer, Air University Pakistan Speech Title: Neurorobotics and Brain-computer Interface for Rehabilitation
16:40-17:00	Speaker 3: Badong Chen, Xi'an Jiaotong University Speech Title: Information Theoretic Learning
17:00-17:20	Speaker 4: Honggui Han, Beijing University of Technology Speech Title: Intelligent Scheduling Methods and Technologies for Large-scale Recycling of Waste Electronic Products
17:20-17:40	Speaker 5: Wei He, Beijing Information Science and Technology University Speech Title: Fundamental Research and Prospects of Bionic Flapping-Wing Robots
17:40-18:00	Speaker 6: Yanlong Zhao, Academy of Mathematics and Systems Science, Chinese Academy of Sciences Speech Title: Optimal Identification and Adaptive Control of Set-Valued Systems

Keynote Speakers

Innovative Applications of Intelligent Robots



Lianqing Liu

Shenyang Institute of Automation, Chinese Academy of Sciences

Title

Intelligence and Implementation Methods for Biosyncretic Robots

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 16:00-16:20

Abstract

Silicon-based machine intelligence exhibits advantages in computation and storage, yet faces challenges including difficult data acquisition and a lack of learning and generalization capabilities. Carbon-based biological intelligence, conversely, demonstrates strengths in autonomous learning, reasoning, and associative thinking. Therefore, developing a novel biosyncretic intelligence through the interaction and fusion of silicon-based and carbon-based intelligence—achieving complementary advantages between the two—represents a viable approach to overcoming current bottlenecks in robotic intelligence development. There are two pathways to implementing biosyncretic robot intelligence: One is a bottom-up approach that employs in vitro biological neural networks as the substrate, facilitates information exchange with robots via bio-electromechanical interfaces, and functionally remodels the biological network based on the robot's behavior feedback, thereby engendering robot intelligence with biological characteristics. The other is a top-down approach that constructs animal-robot fusion systems based on brain-machine interfaces, achieves bio-electromechanical intelligence fusion through bidirectional information and behavioral interactions, forms a biosyncretic robot intelligence, and consequently realizes behavioral enhancement of brain-machine intelligence integrated robotic systems.

Biography

Lianqing Liu is a Professor at Shenyang Institute of Automation, Chinese Academy of Sciences. Currently his research interests include Biosyncretic systems, Micro/Nanorobotics, Intelligent control. He has published over 100 peer reviewed international journal papers and led more than 20 funded research projects as Principal Investigator. He was awarded the Early Career Award by the IEEE Robotics and Automation Society in 2011, Outstanding Young Scientist of Chinese Academy of Sciences in 2014, Rising Star Award of 3M-Nano Society in 2015, Talent Young Scholar Funds of NSFC in 2015, National Program for support of Top-Notch Young Professionals in 2015, Xiongyoulun Outstanding Youth Award in 2018, Distinguished Young Scholar Funds of NSFC in 2019, Xplore Prize in 2024. He is the winner of Best Student/Conference paper Award for ICRA, IROS, ROBIO, ICIRA, IEEE-NEMS, IEEE-CYBER, IEEE-NANOMED and IEEE-3M-NANO. He has been elected as the vice president of IEEE Robotics and Automation Society for the term of 2018-2019, served as a member of long range planning committee of RAS.

Keynote Speakers

Innovative Applications of Intelligent Robots



Noman Naseer

Air University, Islamabad

Title

Neurorobotics and Brain-computer Interface for Rehabilitation

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 16:20-16:40

Abstract

Neurorobotics is the combined study of neuroscience, robotics and artificially intelligent systems. It can be used to provide a means of communication for people suffering from severe motor disabilities or with limb amputation. This talk with focus on development of electromyography (EMG)-based control of prosthetic arm and electroencephalography (EEG)-based control of external devices including a wheelchair for rehabilitation of mobility in paralyzed individuals. Details of a recently developed functional near-infrared spectroscopy (fNIRS) system for brain-imaging and its application for brain-computer interface will be presented. Some recent works done at Neuroimaging Research Group at Air University, Islamabad will be presented as well.

Biography

Dr. Noman Naseer is a Senior Member of IEEE and serves as the Chairman of the Department of Mechatronics and Biomedical Engineering at Air University, Islamabad. He is also the Vice President of the IEEE Robotics and Automation Society, Pakistan. Additionally, Dr. Naseer is the founding Director of the Neuroimaging Research Group at Air University, Islamabad. Dr. Naseer has authored 2 books and over 150 peer-reviewed papers, garnering approximately 5,000 citations worldwide. He serves as a reviewer for more than 100 journals and is an Associate Editor for 5 journals. Dr. Naseer has secured research and travel grants totaling over \$1,000,000. Notably, he is a recipient of the prestigious Bill and Melinda Gates Foundation Award. For three consecutive years, his name has been included in the directory of productive scientists in Pakistan. Dr. Naseer's current research interests encompass Neurorobotics, Neurorehabilitation and Machine Learning.

Keynote Speakers

Innovative Applications of Intelligent Robots



Badong Chen

Xi'an Jiaotong University

Title

Information Theoretic Learning

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 16:40-17:00

Abstract

Information theory has attracted increasing attention in the fields of machine learning and signal processing in recent years. Novel information theoretic approaches have been proposed for different learning problems, such as supervised learning with the minimum error entropy (MEE) criterion, and representation learning with the information bottleneck (IB) principle. This talk introduces the basic principles and algorithms of information theoretic learning (ITL), and discusses the applications in different fields such as brain inspired computing, brain computer interfaces and brain disease diagnosis.

Biography

Badong Chen received the Ph.D. degree in Computer Science and Technology from Tsinghua University, Beijing, China, in 2008. He is currently a professor with the Institute of Artificial Intelligence and Robotics, Xi'an Jiaotong University, Xi'an, China. His research interests are in machine learning, artificial intelligence, brain computer interfaces and robotics. He has authored or coauthored over 300 articles in various journals and conference proceedings (with 18000+ citations in Google Scholar), and has won the 2022 Outstanding Paper Award of IEEE Transactions on Cognitive and Developmental Systems. Dr. Chen has served as a Member of the Machine Learning for Signal Processing Technical Committee of the IEEE Signal Processing Society, and serves (or has served) as an Associate Editor for several journals including IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Cognitive and Developmental Systems, IEEE Transactions on Circuits and Systems for Video Technology. He has served as a PC or SPC Member for prestigious conferences including UAI, IJCAI and AAAI, and served as a General Co-Chair of 2022 IEEE International Workshop on Machine Learning for Signal Processing.

Keynote Speakers

Innovative Applications of Intelligent Robots



Honggui Han

Beijing University of Technology

Title

Intelligent Scheduling Methods and Technologies for Large-scale Recycling of Waste Electronic Products

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 17:00-17:20

Abstract

To address challenges such as the low recycling rate and high operating costs of waste electronic products, the project team conducted years of dedicated research and proposed a precise identification method for classifying and grading waste electronic products, developed a multi-level dynamic scheduling model for recycling paths and created a large-scale, intelligent, and secure recycling platform to achieve the efficient and cost-effective recycling of waste electronic products.

Biography

Han Honggui is a professor and doctoral supervisor at Beijing University of Technology, specializing in intelligent optimization and control of complex systems. He has been selected for prestigious programs, including the National Natural Science Foundation of China Distinguished Young Scholars Fund and Excellent Young Scholars Fund. His academic record has been published over 100 academic papers, authored five books, and obtained more than 80 authorized patents in China and the United States. Additionally, he has led or contributed to the development of over ten national, industry, and local standards. His significant contributions have earned him honors such as the Second Class Prize of the National Award for Science and Technology Progress and the China Youth Science and Technology Award. Currently, he is the director of the Digital Community Ministry of Education Engineering Research Center and the Computational Intelligence and Intelligent Systems Beijing Key Laboratory. He also serves as an editorial board member for SCIENCE CHINA Technological Sciences and IEEE Transactions on Cybernetics.

Keynote Speakers

Innovative Applications of Intelligent Robots



Wei He

Beijing Information Science and Technology University

Title

Fundamental Research and Prospects of Bionic Flapping-Wing Robots

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 17:20-17:40

Abstract

Flapping-wing robots are a class of aircraft inspired by the flight mechanisms of insects and birds. Compared to conventional fixed-wing and rotary-wing aircraft, they offer advantages such as light weight, high efficiency, strong maneuverability, low energy consumption, and enhanced safety, making them a pivotal focus in the development of bionic robotics. The flight principles of bionic flapping-wing robots are highly complex, which complicates structural design and aerodynamic analysis, thereby affecting the execution of tasks such as autonomous flight, visual perception, and swarm collaboration. This report will investigate key technologies in bionic flapping-wing robots, covering flight mechanism analysis, structural design optimization, visual perception systems, flight control systems, and efficient bionic swarm coordination. It will also introduce several flapping-wing robot prototypes and experimental platforms developed by our team, and conclude with prospects for future research in this field.

Biography

Wei He is currently working as a professor in School of Automation and Institute of Artificial Intelligence, Beijing Information Science and Technology University. He is a Fellow of IEEE, AAIA and CAA. He has co-authored 5 books and published over 400 international journal and conference papers. He is a highly cited researcher by Clarivate Analytics. From 2016, he has been the Chair of IEEE SMC Society Beijing Capital Region Chapter. From 2018, he has been the Chair of IEEE SMC Technical Committee on Autonomous Bionic Robotic Aircraft. He is serving as the Senior Editor of IEEE Transactions on Systems, Man, and Cybernetics: Systems. He was served/is serving as Associate Editor of IEEE Transactions on Robotics, IEEE Transactions on Neural Networks and Learning Systems, IEEE Transactions on Control Systems Technology, IEEE/ASME Transactions on Mechatronics, IEEE Transactions on Automation Science and Engineering, SCIENCE CHINA Information Sciences, IEEE/CAA Journal of Automatica Sinica, etc. His current research interests include robotics and intelligent control systems.

Keynote Speakers

Innovative Applications of Intelligent Robots



Yanlong Zhao

Academy of Mathematics and Systems Science, Chinese Academy of Science

Title

Optimal Identification and Adaptive Control of Set-Valued Systems

Location: Room1: 3F, 307 Time: Nov 19, (Wednesday), 17:40-18:00

Abstract

This report begins with the identification of set-valued systems and clarifies the essential differences and inherent challenges between parameter identification based on set-valued data and classical parameter identification. We establish a characterization of the maximal identifiability achievable from set-valued data and present a set-valued optimal identification algorithm that attains this maximal capability, together with its supporting theoretical results. The connection and distinction between this framework and neural-network-based identification are also discussed. Furthermore, the methodology is extended to the consensus control of general multi-agent systems, where a consensus control strategy is developed that operates with only one-bit communication between sensors per update. This provides a viable solution for achieving consensus tasks under extremely constrained communication conditions.

Biography

Professor Yanlong Zhao received the B.S. degree in mathematics from Shandong University, Jinan, China, in 2002, and the Ph.D. degree in systems theory from the Academy of Mathematics and Systems Science (AMSS), Chinese Academy of Sciences (CAS), Beijing, China, in 2007. Since 2007, he has been with the AMSS, CAS, where he is currently a full Professor and a Vice Director of State Key Laboratory of Mathematical Sciences. His research interests include the identification and control of quantized systems, information theory and modelling of financial systems. Yanlong Zhao was awarded the Second Prize of the State Natural Science Award of China in 2015. He has been a Deputy Editor-in-Chief of Journal of Systems Science and Complexity, an Associate Editor for Automatica, SIAM Journal on Control and Optimization, and IEEE Transactions on Systems, Man and Cybernetics: Systems. He served as a Vice-President of Asian Control Association and a Vice-President of IEEE CSS Beijing Chapter, and is now a Vice-President and Fellow of the Chinese Association of Automation (CAA) and the Chair of Technical Committee on Control Theory, CAA.

ThSeA-Keynote Session A

Advanced Control Theory and Embodied Intelligence

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 13:30-15:30

Session Chair: Chen Chen, Institute of Automation, Chinese Academy of Sciences

13:30-13:50	Speaker 1: Shengyuan Xu, Nanjing University of Science and Technology Speech Title: Recent Developments on the Stability of Time-Delay Systems
13:50-14:10	Speaker 2: Xinyu Liu, Dalian University of Technology/University of Toronto Speech Title: Robotic Micro and Nanomanipulation: Technologies and Applications
14:10-14:30	Speaker 3: Ming Jiang, University of Technology Sydney Speech Title: Collaborative Perception and Data Interaction in Trusted Spaces
14:30-14:50	Speaker 4: Umar Shahbaz Khan, National University of Sciences and Technology, Pakistan Speech Title: Adaptive Human-Machine Systems for Assistive Technologies: Research Highlights from the National Center of Robotics and Automation (NCRA)
14:50-15:10	Speaker 5: Ningbo Yu, Nankai University Speech Title: Control of Flexible Medical Robots Under Complex Dynamics, Hysteresis and Uncertainties

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Shengyuan Xu

Nanjing University of Science and Technology

Title

Recent Developments on the Stability of Time-Delay Systems

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 13:30-13:50

Abstract

Time-delay systems have been widely investigated in the past decades due to their extensive applications in various engineering systems such as nuclear reactors, long transmission lines in pneumatic systems, rolling mills, and manufacturing processes. The study of stability analysis of time-delay systems is of both practical and theoretical importance. Usually, stability conditions for time-delay systems can be classified into two types: delay-dependent and delay-independent stability conditions. Delay-dependent stability conditions are less conservative especially in the case when the time delay is small. In the literature, various approaches have been proposed to obtain delay-dependent stability conditions; a great number of delay-dependent stability results have been obtained accordingly. In this talk, we will present recent developments on the study of the delay-dependent stability of time-delay systems. Future possible directions on the improvement of stability results are also briefly discussed.

Biography

Shengyuan Xu received his B.Sc. degree from the Hangzhou Normal University, China in 1990, M.Sc. degree from the Qufu Normal University, China in 1996, and Ph.D. degree from the Nanjing University of Science and Technology, China in 1999. From November 1999 to May 2000 he was a Research Associate in the Department of Mechanical Engineering at the University of Hong Kong, Hong Kong. From December 2000 to November 2001, and December 2001 to September 2002, he was a Postdoctoral Researcher in CESAME at the Université catholique de Louvain, Belgium, and the Department of Electrical and Computer Engineering at the University of Alberta, Canada, respectively. Since November 2002, he has joined the School of Automation at the Nanjing University of Science and Technology as a professor.

Prof. Xu was a recipient of the National Excellent Doctoral Dissertation Award in the year 2002 from the Ministry of Education of China. He obtained a grant from the National Science Foundation of China (NSFC) for Distinguished Young Scholars in the year 2006. He was awarded a Cheung Kong Professorship in the year 2008 from the Ministry of Education of China. He is the Principal Investigator of a project supported by the NSFC for Innovative Research Groups, and a winner of the second prize of the National Natural Science Award in the year 2019.

Prof. Xu is a Subject Editor of the Journal of the Franklin Institute, and an Associate Editor of the IEEE Transactions on Cybernetics. His current research interests include robust filtering and control, singular systems, time-delay systems, neural networks, multidimensional systems, nonlinear systems and multi-agent systems.

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Xinyu Liu

Dalian University of Technology/University of Toronto

Title

Robotic Micro and Nanomanipulation: Technologies and Applications

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 13:50-14:10

Abstract

Robotic micro and nanomanipulation represents a new category of enabling technologies for applications in the fields of advanced manufacturing, life sciences, and medicine. With an overarching theme of manipulating micro and nanoscale materials/structures and characterizing/modulating their multi-physical properties, our team has invited a series robotic micro and nanomanipulation techniques, and developed advanced robotic systems to realize a variety of novel applications. This talk will summarize our recent progress along this line, and also outlook the future trends of the field.

Biography

Xinyu Liu is a Professor at Dalian University of Technology, also the Percy Edward Hart Professor of Mechanical and Industrial Engineering at the University of Toronto (U of T). Prior to joining U of T, he was an Associate Professor and the Canada Research Chair in Microfluidics and BioMEMS in the Department of Mechanical Engineering at McGill University. At U of T, his research activities primarily focus micro/nano robotics and soft robotics. He received many international and national research awards, including 10 best paper awards at major engineering and biomedical conferences. He serves as the Corresponding Chair of the IEEE Robotics and Automation Society Technical Committee for Micro and Nano Robotics and Automation, a Senior Editor of IEEE Trans. Automation Science and Engineering and IEEE Robotics & Automation Letters, an Editor of Microsystems & Nanoengineering, and an Advisory Editor of Research. He is a Fellow of the Canadian Academy of Engineering, an elected Member of the European Academy of Sciences and Arts, and a Fellow of ASME and CSME.

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Ming Jiang

University of Technology Sydney

Title

Collaborative Perception and Data Interaction in Trusted Spaces

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 14:10-14:30

Abstract

This research focuses on the construction of trusted spaces and the development of secure, collaborative, and perceptual technologies for edge-intelligent systems. Targeting uncrewed platforms and in-vehicle systems across multiple scenarios, the study addresses key challenges in trustworthy data fusion, human-machine interfaces, secure communication protocols, and cross-domain collaboration among vehicle–road–air terminals.

Biography

Dr. Ming Jiang (PhD, Professor, PhD/Master Supervisor, SM'IEEE) has over 20 years of research & teaching experience in Australia and served as an adjunct professor at the University of Technology Sydney and a permanent faculty member. He holds a bachelor degree from Northeast University (Automation Control) and a postgraduate degree from Northwestern Polytechnic University (Automatic Control), and earned his PhD in Communication Engineering and Network Security from University of Technology Sydney (UTS) in 2008. He later received the UNSW Vice-Chancellor's Distinguished Postdoctoral Fellowship for four years postdoctoral research.

His research focuses on artificial intelligence, human–machine interfaces, quantum information processing, image analysis, and network security. He has made internationally recognized contributions in anomaly detection, misinformation governance, and smart city data analytics, advancing AI applications in complex systems and blockchain frameworks.

He has published over 220 SCI/EI-indexed papers, including around 150 in Q1–Q2 journals, holds five China–Australia patents, and led 12 major research projects worth about 17 million RMB.

Professional Roles:

- Founding Member, Adaptive Programming and Responsible Learning (ADPRL) China Expert Committee
- President, Australian Low-Altitude Economy Alliance
- Reviewer, National Natural Science Foundation of China (NSFC)
- Associate Editor, Knowledge-Based Systems (SCI Tier 1 Journal)

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Umar Shahbaz Khan

National University of Sciences and Technology, Pakistan

Title

Adaptive Human-Machine Systems for Assistive Technologies: Research Highlights from the National Center of Robotics and Automation (NCRA)

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 14:30-14:50

Abstract

In this plenary talk, Prof. Umar Shahbaz Khan will present a unified vision of assistive human machine systems spanning neural, cognitive, and robotic modalities, along with representative research from his group and collaborators at NCRA. The talk is structured in three major parts:

- 1.Enhanced SSVEP-based BCI: Subject-Dependent and Subject-Independent Classification.
- 2.Scene Scribe: Agentic Visual Assistance via Vision–Language Models.
- 3.Robotic Prosthetic Upper Limb: Toward Intention-Driven Control.

Biography

Dr. Umar Shahbaz Khan did his bachelors in mechatronics engineering from National University of Sciences and Technology, Pakistan in 2005. He completed his PhD in electrical engineering and electronics from University of Liverpool, UK. Currently he is working as a Tenured Professor at the department of mechatronics engineering, National University of Sciences and Technology and his research interests include Image processing, embedded systems, prosthesis, Robotics and Automation. He is also the Director of the National Centre of Robotics and Automation which is a 12.69 million USD Project. He has acquired over 14 Million USD from various grants. He has filed 1 trademark, 3 copyrights, 22 design patents and 1 utility patent out of which 3 have been granted. He is co-founder of two spinoffs and has over 100 publications. He has been awarded best teacher and best community service teacher award by NUST in 2022 and 2023 respectively. He is also the member of various panels at Pakistan Engineering council, Higher Education Commission, Ministry of Science and Technology, Ministry of Aviation and Ministry of Planning Development and Special Initiatives. He has also served as the co-opted member of Pakistan Engineering Council national curriculum development committee for Mechatronics Engineering. He has been awarded the President's pride of performance civil award on 23rd March 2024 for his notable contributions.

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Ningbo Yu
Nankai University

Title

Control of Flexible Medical Robots Under Complex Dynamics, Hysteresis and Uncertainties

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 14:50-15:10

Abstract

Flexible medical robots such as endoscopic systems operate under complex dynamics, hysteresis, and uncertainties. We introduce a cohesive framework of data-driven estimation and advanced control to address these challenges. Our approach leverages Koopman-based linearization, active error bounding and set-membership filters to characterize system behavior. These estimations then inform adaptive and robust controllers designed to compensate for actuation hysteresis and parametric variations. Experimental validations demonstrate substantial improvements in tracking accuracy and robustness.

Biography

Dr. Ningbo Yu is a Professor in the College of Artificial Intelligence at Nankai University, and an Adjunct Professor at the Shenzhen Loop Area Institute. His research is dedicated to advancing medical robotics and trusted behavior intelligence. Dr. Yu obtained his BEng from Tianjin University, MPhil from HKUST, and PhD from ETH Zurich. He has authored 100+ peer-reviewed papers and 20+ patents, and received 20+ awards for research papers and competitions. He serves on boards and committees of multiple journals and conferences in both engineering and medicine.

ThSeB-Keynote Session B

Artificial Intelligence and Intelligent Computing

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 16:00-18:00

Session Chair: Xiaohu Zhou, Institute of Automation, Chinese Academy of Sciences

16:00-16:20	Speaker 1: Yongchun Fang, Nankai University Speech Title: Modeling and Nonlinear Control for Quadrotor Transportation Systems
16:20-16:40	Speaker 2: Guangming Xie, Peking University Speech Title: Biomimetic Underwater Robot
16:40-17:00	Speaker 3: Hao Liu, Shenyang Institute of Automation, Chinese Academy of Sciences Speech Title: Augmented Sensing and Autonomous Control of Flexible Surgical Robots
17:00-17:20	Speaker 4: Qining Wang, Peking University Speech Title: Human-Robot Coupled System Dynamics and Motion Control
17:20-17:40	Speaker 5:Maobin Lv, Beijing Institute of Technology Speech Title: Distributed State Estimation for Jointly Observable Linear Systems

Keynote Speakers

Artificial Intelligence and Intelligent Computing



Yongchun Fang
Nankai University

Title

Modeling and Nonlinear Control for Quadrotor Transportation Systems

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 16:00-16:20

Abstract

This talk discusses the recent research results on the dynamics analysis and modeling, motion planning, and nonlinear control of the quadrotor transportation systems. Specifically, a precise model is first set up for the “twofold” underactuated aerial transportation system after careful analysis. Then, for various application-oriented scenarios, some motion planning techniques are introduced to construct suitable trajectories in consideration of state and control constraints. For the given trajectories, nonlinear control algorithms are designed to achieve satisfactory performance, as supported by numerous experimental results and practical applications.

Biography

Yongchun Fang received the B.S. degree in electrical engineering and the M.S. degree in control theory and application, both from Zhejiang University, P. R. China, in 1996 and 1999, respectively, and the Ph.D. degree of electrical engineering from Clemson University in 2002.

From 2002 to 2003, Dr. Fang was a postdoctoral research fellow at the Mechanical and Aerospace Engineering Department, Cornell University. Since 2003, Dr. Fang has been a professor at the Institute of Robotics and Automatic Information System, Nankai University, Tianjin, P. R. China.

Dr. Fang’s research interests include underactuated systems control, visual servoing, AFM-based nano-manipulation, and so on.

Dr. Fang is a recipient of the China National Funds for Distinguished Young Scientists, and he won the First Prize of Wu Wenjun Natural Science of Artificial Intelligence in 2017.

Keynote Speakers

Advanced Control Theory and Embodied Intelligence



Guangming Xie
Peking University

Title
Biomimetic Underwater Robot

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 16:20-16:40

Abstract

Biomimetic underwater robots hold immense potential for a wide range of applications in ocean exploration and development. This presentation provides an overview of the research progress made by Professor Guangming Xie of Peking University in this field. It covers motion bionics and learning-based control, perception bionics, communication bionics, gripper bionics, swarm behavior bionics, as well as potential applications of biomimetic underwater robots.

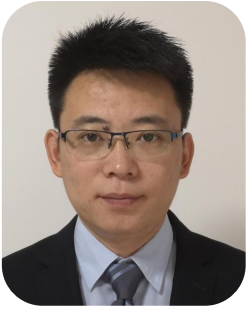
Biography

Guangming Xie is a professor at the School of Advanced Manufacturing and Robotics, Peking University. He received his B.S. degrees in Applied Mathematics and Electronic & Computer Technology, as well as his M.E. and Ph.D. degrees in Control Theory and Control Engineering, all from Tsinghua University, China, in 1996, 1998, and 2001, respectively. From July 2001 to June 2003, he worked as a postdoctoral research fellow at the Center for Systems and Control at Peking University.

He is the founder and director of the Intelligent Biomimetic Design Lab (IBDL). His research interests include biomimetic robotics and multi-robot cooperation. To date, he has published more than 200 papers and authored three books. From 2014 to 2024, he was recognized by Elsevier as one of the Most Cited Chinese Researchers in the field of Control and Systems Engineering. In 2023, he was listed among the world's top 2% of scientists—both in career-long impact and annual impact—according to a ranking jointly released by Stanford University and Elsevier.

Keynote Speakers

Artificial Intelligence and Intelligent Computing



Hao Liu

Shenyang Institute of Automation, Chinese Academy of Sciences

Title

Augmented Sensing and Autonomous Control of Flexible Surgical Robots

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 16:40-17:00

Abstract

The human lumens are torturous and confined spaces, serving as both common sites for serious and difficult diseases and critical access for diagnostic and therapeutic procedures. Flexible surgical robots, with their exceptional environmental adaptability and dexterous manipulation capabilities, have emerged as an enabling technology for intra-luminal interventions. They attract extensive global research and some of them have already been preliminary clinical used. However, current technologies still face significant challenges when addressing complex surgical tasks within lumens. Moreover, the future of surgical robotics inevitably trends toward intelligent systems, aiming to provide surgeons with safer and user-friendly surgical solutions. This report will review the current status of flexible surgical robots and present the speaker's research on the sensing and control of flexible surgical robots.

Biography

Professor Hao Liu received his B.S., M.S. and Ph.D in Mechanical Engineering from Harbin Institute of Technology, China in 2004, 2006 and 2010 respectively. From 2014 to 2015, he visited the LCSR Laboratory of Johns Hopkins University in the United States. His research interest focuses on the mechanism design, sensing, navigation and autonomous control of endoscopic surgical robots, applying in human lumen like the digestive tract, blood vessels, abdominal cavity etc.. He published more than 100 academic papers, including IJRR, IEEE/ASME TMech, IEEE TIE etc. He has won 3 best international conference paper awards. He was also authorized 45 patents. He won the National Innovation Award of China and his achievement was elected to be Top Ten Scientific and Technological Progress of China's Intelligent Manufacturing in 2021.

Keynote Speakers

Artificial Intelligence and Intelligent Computing



Qining Wang
Peking University

Title
Human-Robot Coupled System Dynamics and Motion Control

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 17:00-17:20

Abstract

In this talk, we will discuss the frontiers on Human-robot coupled system dynamics and motion control. At first, the human-prosthesis coupled full-body musculoskeletal model that integrates the dynamics of the muscle-driven human body and a motor-driven robotic prosthesis. This model can be used to perform the inverse kinematics and dynamics calculation based on measurements for amputees wearing a force controlled or position-controlled prosthesis. As a result, we can analyze the impacts of prostheses on amputee kinetic states, such as joint torques and muscle forces. In addition, we will show the progress of my research team on wearable robotics and human-machine interfaces.

Biography

Qining Wang received the Ph.D. degree in dynamics and control from Peking University, Beijing, China, in 2009. He is currently a Full Professor with the School of Advanced Manufacturing and Robotics, Peking University. He has authored/coauthored more than 280 scientific papers in international journals and refereed conference proceedings. His research interests include wearable robotics and human-machine interfaces. Dr. Wang was an Associate Editor for IEEE ROBOTICS AND AUTOMATION MAGAZINE from 2016 to 2018, and a Technical Editor for IEEE/ASME TRANSACTIONS ON MECHATRONICS from 2017 to 2020. He has been an Associate Editor for Robotica since 2018 and IEEE TRANSACTIONS ON MEDICAL ROBOTICS AND BIONICS since 2018.

Keynote Speakers

Artificial Intelligence and Intelligent Computing



Maobin Lv

Beijing Institute of Technology

Title

Distributed State Estimation for Jointly Observable Linear Systems

Location: Room1: 3F, 307 Time: Nov 20, (Thursday), 17:20-17:40

Abstract

In this talk, we introduce the distributed state estimation problem for jointly observable linear systems under two challenges: unreliable networks and system uncertainty. For unreliable networks, we propose a new observability decomposition method and develop a distributed Luenberger observer that works for jointly observable linear systems over jointly connected networks. For uncertain systems, we design a distributed nonlinear adaptive observer consisting of two time-varying distributed observer dynamics, an output filter, and two nonlinear mappings. This observer simultaneously recovers system parameters and achieves distributed state estimation for jointly observable uncertain linear systems.

Biography

Maobin Lu received his Ph.D. from the Chinese University of Hong Kong in 2015 and then conducted his postdoctoral research at City University of Hong Kong. He joined Beijing Institute of Technology in 2018 and is currently a Professor at the School of Automation, Beijing Institute of Technology.

His primary research interests include output regulation of complex dynamic systems, distributed estimation, cooperative control and game theory, as well as robust control of unmanned systems. He has been honored with many academic awards, such as Best Paper Award in IEEE ICCA, Shimemura Young Author Award at the Asian Control Conference (ASCC), Best Paper Award in World Congress on Intelligent Control and Automation (WCICA), and Zhang Si-Ying (CCDC) Outstanding Youth Paper Award. He also has won multiple championships in unmanned systems competitions, including the DJI Robomaster Intelligent UAV Planning and Control Championship, the Flight Avoidance Competition and Air-Ground Cooperation Competition Championships at the International Intelligent Unmanned Systems Application Challenge, and the Championship at the IROS Aerial Autonomy Challenge. Currently, he serves as Deputy Secretary-General of Youth Working Committee of the Chinese Association of Automation.

Technical Program for Tuesday November 18, 2025

TuSeA-Session-A1
Young Author Prize Evaluation Session

Paper Selection Session
Room 2: 305CD

13:30-13:50, Paper TuSeA-Session-A1.1 Annihilation of Uncertain Distortion Voltage and Load Torque for Induction Motors: A Novel Nonlinear Disturbance Observer-Based Approach	
Gong, Yizhou	ShanghaiTech University
Zhang, Heng	ShanghaiTech University
Wang, Yang	ShanghaiTech University
13:50-14:10, Paper TuSeA-Session-A1.2 A Path Following Guidance Law for Shared Control	
Tufte, Andreas Gudahl	Norwegian University of Science and Technology
Gusev, Alexey	Norwegian University of Science and Technology
Erlandsen	Magne Johannes Eindhoven University of Technology
Breivik	Morten Norwegian University of Science and Technology
Petermann, Felix-Marcel	Norwegian University of Science and Technology
Veitch, Erik	Norwegian University of Science and Technology
Alsos, Ole Andreas	Norwegian University of Science and Technology
14:10-14:30, Paper TuSeA-Session-A1.3 Adaptive Fuzzy Control with Friction Compensation for Rehabilitation Robot Driven by Series Elastic Actuators	
Xu, Changxian	Changchun University of Technology
Zhu, Zhenhao	Changchun University of Technology
Zhao, Liming	Changchun University of Technology
Wang, Zenghui	Changchun Humanities and Sciences College
Wang, Gang	Changchun University of Technology
Liu, Yongbai	Xi' an University of Posts and Telecommunications
Liu, Keping	Jilin Engineering Normal University
14:30-14:50, Paper TuSeA-Session-A1.4 A Gamified Interactive Training System Based on a Compliant 2-DOF Upper-Limb Rehabilitation Robot and Its Rehabilitation Efficacy	
Zheng, Yan	University of Shanghai for Science and Technology
Yu, Dan	Shanghai YangZhi Rehabilitation Hospital (Shanghai Sunshine Reha)
Yang, Jiantao	University of Shanghai for Science and Technology
Yang, Hongjun	Institute of Automation, Chinese Academy of Sciences
14:50-15:10, Paper TuSeA-Session-A1.5 Inter-State Pattern Subtraction Improves Cross-State Motor Imagery EEG Decoding	
Lin, Tianyu	University of Chinese Academy of Sciences
Wang, Jiaxing	Institute of Automation, Chinese Academy of Sciences
Liu, Zeyu	Institute of Automation, Chinese Academy of Sciences
Jing, Yitao	Institute of Automation, Chinese Academy of Sciences
Su, Jianqiang	Institute of Automation, Chinese Academy of Sciences
Xiang, Kexin	Institute of Automation, Chinese Academy of Sciences
Hu, Bin	Institute of Automation, Chinese Academy of Sciences
Shi, Weiguo	Institute of Automation, Chinese Academy of Sciences
Wang, Weiqun	Institute of Automation Chinese Academy of Sciences
15:10-15:30, Paper TuSeA-Session-A1.6 A Musculoskeletal Model-Based Algorithm for Rehabilitation Evaluation of Hemiplegic Patients	
Xu, Wei	Wuhan University
Yi, Shuwen	Wuhan University
Liu, Xingzhuo	Wuhan University
Liu, Yalun	Wuhan University
Xu, Wenhang	Wuhan University
Yue, Chuqiao	Wuhan University
Liu, Haoxin	Wuhan University
Xiong, Nanxiang	Zhongnan Hospital of Wuhan University
Guo, Zhao	Wuhan University

Technical Program for Tuesday November 18, 2025

TuSeA-Session-A2
Task Assignment, Path Planning, and Control for Multiple Autonomous Robots

Invited Session
Room 3: 305E

Chair: Xu, Yong, Beijing Institute of Technology

Co-chair: Zhao, Zhijia, Guangzhou University

13:30-13:50, Paper TuSeA-Session-A2.1 Fixed-Time Consensus Control of Distributed Parameter Multiagent Systems: An Adaptive Neural Network Approach	
Zhao, Zhijia	Guangzhou University
Zeng, Yixiang	Guangzhou University
Kang, Xuliang	Guangzhou University
Zou, Tao	Guangzhou University
Liu, Zhijie	University of Science and Technology Beijing
13:50-14:10, Paper TuSeA-Session-A2.2 Adaptive Fuzzy Observer-Based Piecewise Containment Control for Distributed Parameter Multi-Agent Systems	
Zhao, Zhijia	Guangzhou University
Lin, Hongkun	Guangzhou University
Kang, Xuliang	Guangzhou University
Zeng, Yixiang	Guangzhou University
Liu, Zhijie	University of Science and Technology Beijing
14:10-14:30, Paper TuSeA-Session-A2.3 Active Fault-Tolerant Control of a 2-DOF Helicopter System with Sensor Fault	
Zhang, Di	Guangzhou University
Weng, Yan	Guangzhou University
He, Shude	Guangzhou University
Zhao, Zhijia	Guangzhou University
14:30-14:50, Paper TuSeA-Session-A2.4 Cooperative Task Allocation of Multi-USV Based on Clustering and Optimization Algorithm	
Yu, Wenzhao	Wuhan University
Qiao, Jingchao	Wuhan University of Technology
Du, Zhe	Wuhan University of Technology
Huang, Houming	Wuhan University of Technology
14:50-15:10, TuSeA-Session-A2.5 Compensation-Based Distributed Estimation and Secure Control of Cyber-Physical Multi-Agent Systems Under Hybrid Attacks	
Mengying Wan	Beijing Institute of Technology
Yong Xu	Beijing Institute of Technology
15:10-15:30, TuSeA-Session-A2.6 A Tilt-Rotor Aerial Robot for Attaching Loads to Inclined Surfaces	
Ge Chen	Hunan University
Hang Zhong	Hunan University

Technical Program for Tuesday November 18, 2025

TuSeA-Session-A3
Design, Perception, and Control of Wearable Robots

Invited Session
Room 4: 305AB

Chair: Leng, Yuquan, Harbin institute of Technology

Co-chairs: Zhang, Mingming, Southern University of Science and Technology

Co-chairs: Chen, Xinxing, Huazhong University of Science and Technology

13:30-13:50, Paper TuSeA-Session-A3.1 Design of a Control System for an Abdominal Rehabilitation Massage Robot	
Xing, Xin	University of Shanghai for Science and Technology
Yang, Jiantao	University of Shanghai for Science and Technology
Shi, Ping	University of Shanghai for Science and Technology
13:50-14:10, Paper TuSeA-Session-A3.2 A Practical Design Framework for Lower-Limb Exoskeletons: Prioritizing Assistive Joint and Timing Based on Human Biomechanics	
Tan, Xiaowei	Shenyang Institute of Automation, Chinese Academy of Sciences
Lv, Dong	Northeastern University
Jiang, Weizhong	Shenyang Institute of Automation, Chinese Academy of Sciences
Liu, Zhaoyuan	Shenyang Institute of Automation, Chinese Academy of Sciences
Zhang, Bi	Northeastern University
Zhao, Xingang	Shenyang Institute of Automation, Chinese Academy of Sciences
14:10-14:30, Paper TuSeA-Session-A3.3 Text-Dominant Disentangled Fusion Network for Multimodal Sentiment Analysis	
Xiao, Tengfei	Tianjin University of Technology
Wang, Zhiyong	Harbin Institute of Technology, Shenzhen
Ouyang, Gaoxiang	Beijing Normal University
Li, Jing	Tianjin University of Technology
14:30-14:50, Paper TuSeA-Session-A3.4 A Fatigue-Based Approach to Selecting Assisted Joints for Lower Limb Exoskeletons in Uphill Walking	
Zhang, Guotong	Harbin Institute of Technology, Shenzhen
Leng, Yuquan	Harbin Institute of Technology, Shenzhen
Xian, Haolan	Southern University of Science and Technology
Zhang, Yuanwen	Harbin Institute of Technology, Shenzhen
Zhang, Lijing	Harbin Institute of Technology, Shenzhen
14:50-15:10, Paper TuSeA-Session-A3.5 RA-FER: Retrieval-Augmented Framework for Facial Expression Recognition	
Xu, Haoran	Harbin Institute of Technology, Shenzhen
Gao, Yu	Harbin Institute of Technology, Shenzhen
Ren, Weihong	Harbin Institute of Technology, Shenzhen
Wang, Zhiyong	Harbin Institute of Technology, Shenzhen
Liu, Honghai	Harbin Institute of Technology, Shenzhen
15:10-15:30, Paper TuSeA-Session-A3.6 A Human Gait Symmetry Estimation Algorithm Based on Multi-Sensor Fusion Model	
Zhao, Guangyin	Huazhong University of Science and Technology
Chen, Xinxing	Huazhong University of Science and Technology
Huang, Jian	Huazhong University of Science and Technology

Technical Program for Tuesday November 18, 2025

TuSeA-Session-A4
AI-Based Image Perception and Intelligent Recognition

Invited Session
Room 5: 308

Chair: Zou, Yao, University of Science and Technology Beijing

Co-chair: Zhang, Linsen, Institute of Automation, Chinese Academy of Sciences

13:30-13:50, Paper TuSeA-Session-A4.1 Scale, Don't Fine-Tune: Guiding Multimodal LLMs for Efficient Visual Place Recognition at Test-Time	
Cheng, Jintao	The Hong Kong University of Science and Technology
Li, Weibin	South China Normal University
Luo, Jiehao	South China Normal University
Tang, Xiaoyu	South China Normal University
He, Zhijian	Shenzhen Technology University
Wu, Jin	University of Science and Technology Beijing
Zou, Yao	University of Science and Technology Beijing
Zhang, Wei	The Hong Kong University of Science and Technology
13:50-14:10, Paper TuSeA-Session-A4.2 Re-identifying Object Using Multi-Scale Feature Interaction and Perception with Transformer	
Xu, Mingkai	State Grid Jinan Power Supply Company
Li, Xin	State Grid Jinan Power Supply Company
Li, Cong	State Grid Jinan Power Supply Company
Liu, Chunming	State Grid Jinan Power Supply Company
14:10-14:30, Paper TuSeA-Session-A4.3 Zero-Shot Image Classification by Modeling Implicit Semantic Correlation Transferability	
Zhao, Luna	State Grid Shandong Electric Power Company, Heze Power Supply Company
Ban, Weilong	State Grid Shandong Electric Power Company, Heze Power Supply Company
Du, Wenxiang	State Grid Shandong Electric Power Company, Heze Power Supply Company
Fang, Zhenlu	State Grid Shandong Electric Power Company, Heze Power Supply Company
Zhao, Chenru	State Grid Shandong Electric Power Company, Heze Power Supply Company
Han, Xiao	State Grid Shandong Electric Power Company, Heze Power Supply Company
14:30-14:50, Paper TuSeA-Session-A4.4 Cascaded Mosaicking of Visible Images for Power Equipment with Saliency-Weighted Edges	
Rongjie, Chen	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Huang, Hansheng	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Li, Junhua	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Zhou, Xi	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Wu, Xiaoliang	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Long, Xingju	Zhaoqing Power Supply Bureau of Guangdong Power Grid
Qin, Guangsheng	Zhaoqing Power Supply Bureau of Guangdong Power Grid
14:50-15:10, Paper TuSeA-Session-A4.5 GF-LLaVA: Fusing Multi-Granularity for Multi-Modal Biomedical Images	
Li, Shuo	Institute of Automation Chinese Academy of Sciences
Liu, Shi-Qi	Institute of Automation, Chinese Academy of Sciences
Zhang, Linsen	Institute of Automation, Chinese Academy of Sciences
Zhou, Xiao-Hu	Institute of Automation, Chinese Academy of Sciences
Luo, Zhiling	Fuwai Yunnan Cardiovascular Hospital
Ouyang, Wenbin	Fuwai Hospital
Jiang, Hong	Fuwai Hospital
Hou, Zeng-Guang	Institute of Automation, Chinese Academy of Sciences
Pan, Xiangbin	Fuwai Hospital
Xie, Xiao-Liang	Institute of Automation, Chinese Academy of Sciences
15:10-15:30, TuSeA-Session-A4.6 Coordinate-Free Distributed Localization and Circumnavigation for Nonholonomic Vehicles Without Position Information	
Yao Zou	University of Science and Technology Beijing

Technical Program for Tuesday November 18, 2025

TuSeB-Session-B1
Best Paper Award Evaluation Session

Paper Selection Session
Room 2: 305CD

16:00-16:20, Paper TuSeB-Session-B1.1 A 'sample-To-Answer' Robot for Point-Of-Care Testing of Nucleic Acid	
Yang, Jiayu	Xiamen University
Zeng, Juntian	Xiamen University
Liu, Shi-Qi	Institute of Automation, Chinese Academy of Sciences
Wei, Fangcan	Institute of Automation, Chinese Academy of Sciences
Zhang, Dongxu	Xiamen University
16:20-16:40, Paper TuSeB-Session-B1.2 Kinematic Modeling and Stiffness Analysis of a Rectangular Cable-Driven Soft Robot	
Cai, Xin	University of Science and Technology Beijing
Dong, Ruiyang	University of Science and Technology Beijing
Liu, Zhijie	University of Science and Technology Beijing
He, Wei	University of Science and Technology Beijing
16:40-17:00, Paper TuSeB-Session-B1.3 Human Variability in Human-Robot Locomotion	
Kille, Sean	Karlsruhe Institute of Technology
Panchea, Adina Marlina	Université De Sherbrooke
Hohmann, Soeren	Karlsruhe Institute of Technology
17:00-17:20, Paper TuSeB-Session-B1.4 Non-Invasive Methods for Diabetes Critical Events Prediction (Online)	
Kubaščík, Michal	University of Žilina
Chochul, Miroslav	University of Žilina
Tupý, Andrej	University of Žilina
Karpiš, Ondrej	University of Žilina
17:20-17:40, Paper TuSeB-Session-B1.5 Mamba-Based Continuous Prediction of Joint Angles Using Fuzzy Entropy Features of SEMG	
Zhang, Jinghao	University of Shanghai for Science and Technology
Sun, Tairen	University of Shanghai for Science and Technology
17:40-18:00, Paper TuSeB-Session-B1.6 Adapting Deep Learning Models for Cross-Environment fNIRS Brain Signal Analysis Using Transfer Learning	
Naeem, Rehan	Air University
Akhter, Jamila	Air University
Naseer, Noman	Air University
Hammad, Nazeer	Air University

Technical Program for Tuesday November 18, 2025

TuSeB-Session-B2
Biomedical Signal Analysis for Motor Function Assessment and Restoration

Regular Session
Room 3: 305E

Chair: Chen, Xiaoling, Yanshan University

Co-chair: Tong, Lina, China University of Mining and Technology (Beijing)

16:00-16:20, Paper TuSeB-Session-B2.1 An sEMG-Based Contralateral Functional Electrical Stimulation Control Strategy Via Joint Angle Mapping	
Wang, Wenkai	Institute of Automation, Chinese Academy of Sciences
Chen, Mengya	Institute of Automation, Chinese Academy of Sciences
Li, Zeyi	Institute of Automation, Chinese Academy of Sciences
Yang, Jiantao	University of Shanghai for Science and Technology
Sun, Tairen	University of Shanghai for Science and Technology
Yang, Hongjun	Institute of Automation, Chinese Academy of Sciences
Hou, Zeng-Guang	Institute of Automation, Chinese Academy of Sciences
16:20-16:40, Paper TuSeB-Session-B2.2 Fusing EMG and Inertial Sensing for Multidimensional Assessment of FES-Evoked Motor Function	
Zhang, Dong	Yanshan University
Chen, Xiaoling	Yanshan University
Xie, Ping	Yanshan University
Zhang, Huili	National Research Center for Rehabilitation Technical Aids
Lv, Zeping	National Research Center for Rehabilitation Technical Aids
16:40-17:00, Paper TuSeB-Session-B2.3 Neural Engagement in Motor Imagery EEG Analysis of Active vs. Guided Commands in Post-Stroke Patients (Online)	
Wang, Zhengqing	Memorial University of Newfoundland
Wang, Yihan	University of Chinese Academy of Sciences
Yan, Hezhong	Carleton University
Han, Shuai	Capital Medical University
Wang, Jiaying	Institute of Automation, Chinese Academy of Sciences
17:00-17:20, Paper TuSeB-Session-B2.4 Robust Diagnosis of Parkinson's Disease Via Deep Fusion of EEG and EMG Signals	
Chen, Xiaoling	Yanshan University
Li, Mingyu	Yanshan University
Lv, Zeping	National Research Center for Rehabilitation Technical Aids
Zhang, Huili	National Research Center for Rehabilitation Technical Aids
Zhang, Haohao	Department of Neurosurgery
17:20-17:40, Paper TuSeB-Session-B2.5 A Multi-Dimensional Graph Convolution-Based Approach for Parkinsonian Limb Tremor Recognition	
Zhang, Jingjie	Dalian University
Zhao, Jie	Affiliated Zhongshan Hospital of Dalian University
Kong, Liwen	Dalian University
Song, Qinfen	Dalian University Affiliated Xinhua Hospital
Zou, Qijie	Harbin Engineering University
Lv, Yana	Dalian University
Liang, Shanshan	Affiliated Zhongshan Hospital of Dalian University
Tao, Shuai	Dalian University
17:40-18:00, Paper TuSeB-Session-B2.6 A sEMG-Based Gesture Recognition Method Using SyCoT-Res Oriented towards Older Adults	
Tong, Lina	China University of Mining and Technology
Liu, Yuchen	China University of Mining and Technology

Technical Program for Tuesday November 18, 2025

TuSeB-Session-B3
Design of Human-Machine Systems for Driving, Assistance, and Rehabilitation

Regular Session
Room 4: 305AB

Chair: Yan, Jiaqing, North China University of Technology

Co-chair: Zhao, Yanzhi, Yanshan University

16:00-16:20, Paper TuSeB-Session-B3.1 Identification of Fractional Impedance Model for Human Computer Interaction System	
Sun, Yue	Yanshan University
Zhao, Yanzhi	Yanshan University
Zhao, Hongfei	Yanshan University
Wu, Songyan	Yanshan University
16:20-16:40, Paper TuSeB-Session-B3.2 Frequency Compensated Adaptive Oscillators for Real-Time Lower-Limb Assistance with Gait Recognition	
Zhou, Yuxuan	Nankai University
Chu, Ruichen	Nankai University
Cheng, Guo	Xeno Dynamics, Co., Ltd
Zou, Wulin	Xeno Dynamics, Co., Ltd
Liang, Zhe	Xeno Dynamics, Co., Ltd
Yu, Ningbo	Nankai University
16:40-17:00, Paper TuSeB-Session-B3.3 Development of an Active Upper-Limb Assistive Suit for Climbing Movement (Online)	
Zeng, Fuqiang	WuHan University of Technology
Pang, Muye	Wuhan University of Technology
Su, Zhenyu	Wuhan University of Technology
17:00-17:20, Paper TuSeB-Session-B3.4 High-Performance Lightweight Gaze Estimation Empowered by Auxiliary Attention Supervision on a Hybrid Vision Transformer (Online)	
Jiaju, Wang	North China University of Technology
Tian, Yunzhi	North China University of Technology
Weiao, Zhou	North China University of Technology
Kefan, Zhang	North China University of Technology
Liu, Yang	North China University of Technology
Jiaqing, Yan	North China University of Technology
17:20-17:40, Paper TuSeB-Session-B3.5 Human-In-The-Loop in Partial Driving Automation	
Fuchs, Robert	JTEKT Corporation
Nakade, Tomohiro	JTEKT Corporation
Hashioka, Daisuke	JTEKT Corporation
17:40-18:00, Paper TuSeB-Session-B3.6 Prosthetics Control Using Biosignals Based Human-Machine Interface and Machine Learning (Online)	
Kubaščík, Michal	University of Žilina
Karpiš, Ondrej	University of Žilina
Ševčík, Peter	University of Žilina

Technical Program for Tuesday November 18, 2025

TuSeB-Session-B4
Machine Learning in Vision and Recognition with Human-Computer Interaction

Regular Session
Room 5: 308

Chair: Wu, Peiliang, Yanshan University
Co-chair: Bao, Tianzhe, University of Health and Rehabilitation Sciences

16:00-16:20, Paper TuSeB-Session-B4.1 Center and Link: A Dual-Loss Approach for Holistic Human Pose Estimation	
Guo, Jinbin	Harbin Institute of Technology, Shenzhen
Ji, Haoyu	Harbin Institute of Technology, Shenzhen
Huang, Wenze	Harbin Institute of Technology, Shenzhen
Yang, Zhihao	Harbin Institute of Technology, Shenzhen
Gao, Yu	Harbin Institute of Technology, Shenzhen
Huang, Jian	Guangzhou Institute of Science and Technology
Wang, Zhiyong	Harbin Institute of Technology, Shenzhen
16:20-16:40, Paper TuSeB-Session-B4.2 Adaptive Multi-Scale Attention for Robust Visual-Tactile Feature Fusion (Online)	
Li, Yao	Yanshan University
Wu, Peiliang	Yanshan University
Mingyue, Niu	Yanshan University
Chen, Wenbai	Beijing Information Engineer College
Gao, Guowei	Beijing Information Science and Technology University
Shi, Yan	Shandong Jianzhu University
16:40-17:00, Paper TuSeB-Session-B4.3 Pear Flower Detection Using YOLOv11 Enhanced with FEM and SimAM Attention Mechanisms (Online)	
Xu, Chang	Qingdao University
Gal, Xiaojian	Qingdao University
Wang, Shubo	Qingdao University
17:00-17:20, Paper TuSeB-Session-B4.4 EMG Gesture Recognition and Lightweight Optimization Based on Multi-Scale Residual Convolutional Networks	
Liang, Xueqian	Shandong University of Traditional Chinese Medicine
Zou, Bennjian	University of Health and Rehabilitation Sciences
Wu, Lin	Wuhan Institute of Healthcare Tech Industry
Na, Xiaodong	University of Health and Rehabilitation Sciences
Cao, Wei	University of Health and Rehabilitation Sciences
Bao, Tianzhe	University of Health and Rehabilitation Sciences
Wu, Yuanqing	Sun Yat-Sen University
Wei, Benzhen	Shandong University of Traditional Chinese Medicine
17:20-17:40, Paper TuSeB-Session-B4.5 EEG-Based Multimodal Emotion Recognition with Universal CNN-Based Feature Extraction and Transformer-Based Fusion (Online)	
Wang, Changwei	North China Institute of Science and Technology
Wang, Yang	North China Institute of Science and Technology
Peng, Cheng	University of Science and Technology of China
17:40-18:00, Paper TuSeB-Session-B4.6 Character Recognition Algorithm Based on Multi-Region Collaboration (Online)	
Zheng, Jiawen	Shantou University
Lao, Junjie	Shantou University
Gan, Piao	Shantou University
Zhuang, Jiafan	Shantou University
Fan, Zhun	Shenzhen Institute for Advanced Study, University of Electronic Science and Technology of China

Technical Program for Wednesday November 19, 2025

WeSeA-Session-A1
Adaptive Cooperative and Haptic Shared Control Systems

Invited Session
Room 2: 305CD

Chair: Takahiro Wada, Nara Institute of Science and Technology

Co-chair: Balint Varga, Karlsruhe Institute of Technology

13:30-13:50, Paper WeSeA-Session-A1.1 Should Pedestrians Communicate with Autonomous Personal Mobility Vehicle or Its Passenger? Effects of Understanding of Control Authority and Its Transition Possibility on Communication Target Choice	
Ohta, Atsushi	Nara Institute of Science and Technology
Liu, Hailong	Nara Institute of Science and Technology
Hiraoka, Toshihiro	Japan Automobile Research Institute
Wada, Takahiro	Nara Institute of Science and Technology
13:50-14:10, Paper WeSeA-Session-A1.2 Shared Control in Robotic Brain-Computer Interfaces: Can We Stop Chasing Our Tail? (Online)	
Thomas, Alexander	University College London
Cho, Youngjun	University College London
Zhao, Hubin	University College London
Carlson, Tom	University College London
14:10-14:30, Paper WeSeA-Session-A1.3 Human-Centered Cooperative Control Coupling Autonomous and Haptic Shared Control Via Control Barrier Function	
Sato, Eito	Nara Institute of Science and Technology
Wada, Takahiro	Nara Institute of Science and Technology
14:30-14:50, Paper WeSeA-Session-A1.4 Cooperative Trajectory Planning through Negotiation for a Stand-Up Aid (Online)	
Schneider, Julian	Karlsruhe Institute of Technology
Shen, Yang	Karlsruhe Institute of Technology
Varga, Balint	Karlsruhe Institute of Technology
Hohmann, Soeren	Karlsruhe Institute of Technology

Technical Program for Wednesday November 19, 2025

WeSeA-Session-A2
Modeling and Control Theory of Complex Systems

Invited Session
Room 3: 305E

Chair: Feng, Yun, Hunan University
Co-chairs: Liu, Zhijie, University of Science and Technology Beijing
Co-chairs: Han, Zhiji, Ocean University of China

13:30-13:50, Paper WeSeA-Session-A2.1 Zeroing Neural Network-Based Impedance Learning Controller: Application to Underactuated Prosthesis Hand	
Zhao, Liming	Changchun University of Technology
Xu, Changxian	Changchun University of Technology
Xu, Chunling	Changchun Humanities and Sciences College
Pang, Zaixiang	Changchun University of Technology
Sun, Zhongbo	Changchun University of Technology
13:50-14:10, Paper WeSeA-Session-A2.2 Prescribed-Time Non-Disruptive Formation Control in Open Multi-Agent Systems (I)	
Jia, Zhian	Huazhong University of Science and Technology
Chi, Ming	Huazhong University of Science and Technology
Liu, Zhi-Wei	Huazhong University of Science and Technology
14:10-14:30, Paper WeSeA-Session-A2.3 Machine Learning for Parameter Estimation of Cellular Nonlinear Networks (I)	
La Spina, Giuseppe	University School for Advanced Studies IUSS Pavia
Zhang, Jianhua	Oslo Metropolitan University
Buscarino, Arturo	University of Catania
14:30-14:50, Paper WeSeA-Session-A2.4 An Improved Vision-Based Framework for Pedestrian Target Following on a Quadruped Robot (I)	
Li, Yong	University of Science and Technology Beijing
Yu, Xinbo	University of Science and Technology Beijing
Kong, Linghuan	University of Macau
Hu, Kang	University of Science and Technology Beijing
Wu, YiFan	University of Science and Technology Beijing
He, Wei	University of Science and Technology Beijing
14:50-15:10, WeSeA-Session-A2.5 Modeling and Fault Detection for Lithium-ion Batteries with Unknown Distributed Heat Sources	
Xingyu Zhu	Hunan University
Yun Feng	Hunan University
15:10-15:30, WeSeA-Session-A2.6 PDE-Based Modeling and Control of Flexible Structures: From Vibratory Systems to Continuum Bending Bodies (Online)	
Zhiji Han	Ocean University of China

Technical Program for Wednesday November 19, 2025

WeSeA-Session-A3
Robotic Tactile Sensing and Interaction

Chair: Xiong, Pengwen, Nanchang University

Invited Session
Room 4: 305AB

Co-chairs: Fang, Bin, Beiing University of Posts and Telecommunications

Co-chairs: Shan Luo, King’s College London

13:30-13:50, Paper WeSeA-Session-A3.1 Adaptive Error Augmentation Training with Integrated Kinematic and Muscle Activation Evaluation	
Xiao, Li	Nanjing Institute of Technology
Qian, Kui	Nanjing Institute of Technology
Wu, Junhui	Suzhou Supereal Microelectronics Co., Ltd
Jiacai, Huang	School of Automation
Ruan, Zhihu	Nanjing Institute of Technology
Xue, Jiameng	Nanjing Institute of Technology
13:50-14:10, Paper WeSeA-Session-A3.2 Development of a Laser-PSD Based Sensor for Force Detection	
Fang, Ting	Nanjing University of Aeronautics and Astronautics
Yue, ZeRan	Nanjing University of Aeronautics and Astronautics
Wang, Heng	Nanjing University of Aeronautics and Astronautics
Wu, Changcheng	Nanjing University of Aeronautics and Astronautics
Fei, Fei	Nanjing University of Aeronautics and Astronautics
Zhu, Yongkai	Nanjing University of Aeronautics and Astronautics
14:10-14:30, WeSeA-Session-A3.3 A Semi-Autonomous Teleoperation Control Framework for Mobile Robots with RRT*-Based Obstacle Avoidance	
Zhuoyue Zhang	Lanzhou University of Technology
Haochen Zhang	Lanzhou University of Technology
14:30-14:50, WeSeA-Session-A3.4 Adaptive Robust Cooperative Control Method for Single-Master-Multiple-Slave Teleoperation Robot Systems	
Jinyan Li	Lanzhou University of Technology
Haochen Zhang	Lanzhou University of Technology
14:50-15:10, WeSeA-Session-A3.5 Integrated Dynamic Constraints Trajectory Generation and NMPC Tracking for Robust Navigation of FWMAVs	
Yuting Liu	University of Science and Technology Beijing
Zhijie Liu	University of Science and Technology Beijing
15:10-15:30, WeSeA-Session-A3.6 AcuFlexBot: A Force-Controlled Robot for Breathing-Synchronized Acupuncture	
Chen, Pu	Beijing Institute of Technology
Wen, Hao	Beijing Institute of Technology
Jing, Haibo	Beijing Institute of Technology
Tian, Jiexi	Beijing Institute of Technology
He, Yongzheng	Henan Xiangyu Medical Equipment Co., Ltd
Duan, Xingguang	Beijing Institute of Technology
Li, Changsheng	Beijing Institute of Technology

Technical Program for Wednesday November 19, 2025

WeSeA-Session-A4
Learning, Control and Applications of Robots

Invited Session
Room 5: 308

Chair: Zhao, Bo, Beijing Normal University

Co-chair: Zhang, Dongxu, Xiamen University

13:30-13:50, Paper WeSeA-Session-A4.1

Event-Triggered-Based Optimal Control for Reconfigurable Robot Via Mixed Nonzero-Sum Game (Online)

Ji, Zebin	Changchun University of Technology
Ma, Bing	Changchun University of Technology
Jiang, Hucheng	Changchun University of Technology
Liang, Jingkai	Changchun University of Technology
Dong, Bo	Changchun University of Technology
An, Tianjiao	Changchun University of Technology

13:50-14:10, Paper WeSeA-Session-A4.2

Finite-Time Dynamic Event-Triggered Control for Modular Reconfigurable Robots Based on Adaptive Dynamic Programming (Online)

Ma, Bing	Changchun University of Technology
Xu, Zixuan	Changchun University of Technology
Ji, Zebin	Changchun University of Technology
Liang, Jingkai	Changchun University of Technology
Dong, Bo	Changchun University of Technology
An, Tianjiao	Changchun University of Technology

14:10-14:30, Paper WeSeA-Session-A4.3

Compound Control of Piezoelectric Actuator Based on Prandtl-Ishlinskii Model for Nanopositioning Stage

Deng, Xiaofan	Tianjin University of Technology and Education
Zhu, Haonan	Tianjin University of Technology and Education
Zhong, Junjie	Guangxi Vocational & Technical College
Cui, Liangyu	Tianjin University of Technology and Education

14:30-14:50, Paper WeSeA-Session-A4.4

A Novel Portable Platform for Real-Time Surgical Instrument Segmentation and Quality Scoring in Single-Port Cardiac Surgery

Lin, Haosong	Institute of Automation, Chinese Academy of Sciences
Liu, Shi-Qi	Institute of Automation, Chinese Academy of Sciences
Xie, Xiao-Liang	Institute of Automation, Chinese Academy of Sciences
Zhang, Linsen	Institute of Automation, Chinese Academy of Sciences
Zhou, Xiao-Hu	Institute of Automation Chinese Academy of Sciences
Hou, Zeng-Guang	Institute of Automation, Chinese Academy of Sciences
Ma, Xiyao	Institute of Automation, Chinese Academy of Sciences
Chen, Fengjie	Institute of Automation, Chinese Academy of Sciences

14:50-15:10, Paper WeSeA-Session-A4.5

Autonomous Navigation Control of Hybrid Inspection Robot Based on Graph Search and Trajectory Optimization (Online)

Yongsheng, Xu	State Grid Shandong Electric Power Company, Heze Power Supply Company
Peng, Li	State Grid Shandong Electric Power Company, Heze Power Supply Company
Zhao, Luna	State Grid Shandong Electric Power Company, Heze Power Supply Company
Jubo, Wang	State Grid Shandong Electric Power Company, Heze Power Supply Company
Fazhan, Li	State Grid Shandong Electric Power Company, Heze Power Supply Company

15:10-15:30, Paper WeSeA-Session-A4.6

A Compliant Transition Control Strategy for Plantarflexion-Dorsiflexion Switch in a Bidirectional Cable-Driven Ankle Exoskeleton

Liu, Wenjing	Beihang University
Ji, Yuanlong	Beihang University
Zhou, Mengnan	Beihang University
Song, Yu	Peking University
Zheng, Quan	Beihang University
Fan, Yubo	Beihang University
Yang, Xingbang	Beihang University

Technical Program for Wednesday November 19, 2025

WeSeB-Session-B1
Advanced Control and Path Planning in Autonomous Systems

Regular Session
Room 2: 305CD

Chair: Peng, Zhinan, University of Electronic Science and Technology of China

Co-chair: Zhu, Guoqiang, Northeast Electric Power University

16:00-16:20, Paper WeSeB-Session-B1.1 Critic-Only Dynamic Event-Triggered Consensus for Multi-Robots with Asymmetric Input Constraints	
Xia, Lina	University of Science and Technology Beijing
Li, Qing	University of Science and Technology Beijing
Song, Ruizhuo	University of Science and Technology Beijing
Fan, Xiaoyue	University of Science and Technology Beijing
Yin, Kaixuan	University of Science and Technology Beijing
Yang, Gaofu	University of Science and Technology Beijing
Wang, Mian	University of Science and Technology Beijing
16:20-16:40, Paper WeSeB-Session-B1.2 MSRRT: A Real-Time Path Planning Algorithm Based on Online Updated Main-Sub RRT	
Xu, Zirui	Nanjing University of Science and Technology
He, Zexi	Nanjing University of Science and Technology
Lu, Hanxuan	Nanjing University of Science and Technology
He, Yangjie	Nanjing University of Science and Technology
Hong, Wei	Nanjing University of Science and Technology
16:40-17:00, Paper WeSeB-Session-B1.3 Designing an Artificial Intelligence DrivingAssistance System (AIDAS) for Trainedrivers	
Merlevede, Jean-Valentin	University Polytechnique Hauts-De-France
Enjalbert, Simon	University Polytechnique Hauts-De-France
Vanderhaegen, Frédéric	University Polytechnique Hauts-De-France
Flammini, Francesco	Mälardalen University
17:00-17:20, Paper WeSeB-Session-B1.4 Finite-Time Learning-Based Event-Triggered Optimal Tracking Control for Robotic Manipulators with Prescribed Performance	
Kuang, Yiqun	University of Electronic Science and Technology of China
He, Linpu	University of Electronic Science and Technology of China
Liu, Yongxiang	University of Electronic Science and Technology of China
Peng, Zhinan	University of Electronic Science and Technology of China
Huang, Rui	University of Electronic Science and Technology of China
Cheng, Hong	University of Electronic Science and Technology of China
17:20-17:40, Paper WeSeB-Session-B1.5 Learning-Based Cooperative Game Control of Variable-Wing Hypersonic Vehicles	
Wang, Jun-Wei	University of Science and Technology Beijing
Wang, Feng	University of Science and Technology Beijing
Liu, Zhou-Yang	National Key Laboratory of Complex System Control and Intelligent Agent Cooperation
17:40-18:00, Paper WeSeB-Session-B1.6 Adaptive Prescribed Tracking Performance Control for a Class of Multi-Agent Systems under DoS Attacks	
Tian, Bing	Northeast Electric Power University
Chen, Dandan	Northeast Electric Power University
Tian, Geng	Jilin Agricultural University
Zhang, Xiuyu	Northeast Electric Power University
Zhu, Guoqiang	Northeast Electric Power University

Technical Program for Wednesday November 19, 2025

WeSeB-Session-B2
Model-Based Design and Analysis for Robotic Systems

Regular Session
Room 3: 305E

Chair: Dong, Mingjie, Beijing University of Technology

Co-chair: Liang, Xu, Beijing Jiaotong University

16:00-16:20, Paper WeSeB-Session-B2.1 Model Predictive Impedance Control Based on Koopman Operator (Online)	
Hou, Bojie	Lanzhou University
Ling, Youquan	Lanzhou University
Qiu, Xinan	Lanzhou Institute of Physics, China Academy of Space Technology
Ma, Dongtao	Lanzhou Institute of Physics, China Academy of Space Technology
Zhao, Dongdong	Lanzhou University
Yan, Shi	Lanzhou University
16:20-16:40, Paper WeSeB-Session-B2.2 Data-Driven Predictive Control under Insufficient Data: An Online Updating-Based Approach	
Cheng, Qingyuan	Beihang University
Meng, Deyuan	Beihang University
Wang, Chenchao	Beihang University
16:40-17:00, Paper WeSeB-Session-B2.3 Design and Analysis of a 6-DOF 3P3R Robot Configuration for Closed Reduction of Pelvic Fractures	
Liu, Ruoyuan	Beijing University of Technology
Li, Jianfeng	Beijing University of Technology
Lun, Qinglong	Beijing University of Technology
Zhao, Jingxin	The Fourth Medical Center, Chinese PLA General Hospital
Dong, Mingjie	Beijing University of Technology
17:00-17:20, Paper WeSeB-Session-B2.4 A Multi-Task BiLSTM-Attention Temporal Network for Simultaneous Activity Classification and Knee Joint Angle Estimation	
He, Zhengqing	Zhongyuan University of Technology
Wang, Yan	Zhongyuan University of Technology
Yuan, Menghao	Zhongyuan University of Technology
Su, Tingting	Beijing University of Technology
Yu, Hongnian	Bournemouth University
17:20-17:40, Paper WeSeB-Session-B2.5 A Novel Segmented and Complementary Linear Flux-Switching Permanent Magnet Motor (Online)	
Shen, Chenpu	Changzhou Vocational Institute of Industry Technology
Liu, Jinfu	Changzhou Vocational Institute of Industry Technology
Li, Hui	Changzhou Vocational Institute of Industry Technology
Xu, Jiajun	Nanjing University of Aeronautics and Astronautics
Liang, Xu	Beijing Jiaotong University
17:40-18:00, Paper WeSeB-Session-B2.6 Research on Skiing Motion Similarity Assessment Based on Post Joint Information	
Cong, Xiaodan	Intelligent Manufacturing Institute, Heilongjiang Academy of Sciences
Yang, Ming	Harbin Engineering University
Liu, Xiaoxi	Intelligent Manufacturing Institute, Heilongjiang Academy of Sciences
Guan, Lianwu	Harbin Engineering University
Sun, Siwen	Intelligent Manufacturing Institute, Heilongjiang Academy of Sciences
Song, Changjiang	Intelligent Manufacturing Institute, Heilongjiang Academy of Sciences

Technical Program for Wednesday November 19, 2025

WeSeB-Session-B3
Perception, Prediction, and Safety in Autonomous Systems

Room 4: 305AB
Regular Session

Chair: Cao, Fangfei, Beijing Institute of Technology

Co-chair: Yan, Shuaizheng, Fuzhou University

16:00-16:20, Paper WeSeB-Session-B3.1 Deep Reinforcement Learning-Based Control Strategy for Underwater Manipulator Systems (Online)	
Pan, Shuyuan	Beijing Institute of Technology
Cao, Fangfei	Beijing Institute of Technology
16:20-16:40, Paper WeSeB-Session-B3.2 CiliaSight: A Vision-Based Biomimetic Cilia Array Sensor for Underwater Flow Perception	
Wang, Shibo	Fuzhou University
Yan, Shuaizheng	Fuzhou University
Wu, Zhengxing	Institute of Automation, Chinese Academy of Sciences
He, Bingwei	Fuzhou University
Yu, Junzhi	Institute of Automation, Chinese Academy of Sciences
16:40-17:00, Paper WeSeB-Session-B3.3 Beyond ADE and FDE: A Comprehensive Evaluation Framework for Safety-Critical Prediction in Multi-Agent Autonomous Driving Scenarios	
Liu, Feifei	South China Normal University
Wang, HaoZhe	South China Normal University
Wei, Zejun	South China Normal University
Lu, Qirong	South China Normal University
Wen, Yiyang	Shenzhen Technology University
Tang, Xiaoyu	South China Normal University
Jiang, Jingyan	Shenzhen Technology University
He, Zhijian	Shenzhen Technology University
17:00-17:20, Paper WeSeB-Session-B3.4 Safety-Aligned Reasoning for Automated Vehicles with Large Language Models	
Li, Xiang	The University of Tokyo
Nakano, Kimihiko	The University of Tokyo
17:20-17:40, Paper WeSeB-Session-B3.5 ROV Trajectory Prediction Algorithm Based on Transformer-LSTM	
Han, Shuochen	Harbin Engineering University
Wang, Zhonghao	Harbin Engineering University
Zhang, Guochang	Harbin Engineering University
Li, Chengyang	Northeast Petroleum University
Zhu, Haitao	Harbin Engineering University
Wang, Yanyan	Harbin Engineering University
17:40-18:00, Paper WeSeB-Session-B3.6 Relative Motion Parameter Estimation of Non-Cooperative Targets Using Visual Information with the Adaptive Error-State Kalman Filter (Online)	
Chen, Xianggui	Harbin Institute of Technology
Zhang, Zexu	Harbin Institute of Technology
Guo, Peng	Harbin Institute of Technology
Mao, Yicheng	Harbin Institute of Technology

Technical Program for Wednesday November 19, 2025

WeSeB-Session-B4
Advanced Modeling and Control for Mechatronic Systems with Human-Machine Collaboration

Room 5: 308
Regular Session

Chair: Hu, Wenfeng, Central South University

Co-chair: Wang, Yang, Shanghaitech University

16:00-16:20, Paper WeSeB-Session-B4.1 Physics-Informed Koopman Mixed-Integer Model Predictive Control for Heavy Haul Trains (Online)	
Zhu, Jiayun	Central South University
Yao, Chenqi	Central South University
Hu, Wenfeng	Central South University
16:20-16:40, Paper WeSeB-Session-B4.2 Force-Based Cabin Insertion Assembly with an Off-Robot Force Sensing Configuration	
Hou, Jun	Institute of Automation, Chinese Academy of Sciences
Xing, Shiyu	Institute of Automation, Chinese Academy of Sciences
Ma, Yunkai	Institute of Automation, Chinese Academy of Sciences
Jing, Fengshui	Institute of Automation, Chinese Academy of Sciences
16:40-17:00, Paper WeSeB-Session-B4.3 Relative Attitude Estimation of Ultra-Large Cargo Transportation System Using Modularized Multi-Vehicle Collaboration	
Chen, Xinda	Southeast University
Zhu, Xiaoyuan	Southeast University
Yin, Guodong	Southeast University
17:00-17:20, Paper WeSeB-Session-B4.4 Model-Free Nonlinear Optimal Control with Utility Reshaping Via Iterative Q-Learning	
Tang, Guohan	Beijing University of Technology
Wang, Ding	Beijing University of Technology
Qiao, Junfei	Beijing University of Technology
17:20-17:40, Paper WeSeB-Session-B4.5 Dual-Scale Control Method for Waypoints Tracking Using Low-Sampling ILC-Assisted MRAC (Online)	
Zhang, Heng	ShanghaiTech University
Gong, Yizhou	ShanghaiTech University
Wang, Yang	ShanghaiTech University
Wang, Xuwei	Beijing Institute of Graphic Communication

Technical Program for Thursday November 20, 2025

ThSeA-Session-A1
Advancing Human-Machine Systems through Brain-Computer Interfaces

Invited Session
Room 2: 305CD

Chair: Xu, Minpeng, Tianjin University
Co-chair: Qiu, Shuang, Institute of Automation, Chinese Academy of Sciences
Co-chair: Peng, Weiwei, Shenzhen University

13:30-13:50, Paper ThSeA-Session-A1.1 Fine-Tuning FB-MultiCNN for Enhanced SSVEP Detection in Brain-Computer Interfaces	
Shao, Yiming	Chinese Academy of Medical Sciences & Peking Union Medical College
Zheng, Hongliang	Tiangong University
Chen, Xiaogang	Institute of Biomedical Engineering, Chinese Academy of Medical
13:50-14:10, Paper ThSeA-Session-A1.2 Deep Learning Framework for Tonic Pain Intensity Evaluation Via EEG: A Wavelet CNN-LSTM Approach	
Zhu, Wenxuan	School of Psychology Shenzhen University
Li, Xiaodong	Shenzhen University
Chen, Shihao	Shenzhen University
Chen, Chuwen	Aalborg University
Jin, Richu	Shenzhen Polytechnic University
Li, Xiaoyun	Shenzhen University
Peng, Weiwei	Shenzhen University
14:10-14:30, Paper ThSeA-Session-A1.3 Modulation of Peak Alpha Frequency Via Neurofeedback Produces Sustained Analgesia through Parietal Plasticity	
Wang, Xin	Shenzhen University
Li, Xiaodong	Shenzhen University
Li, Xiaoyun	Shenzhen University
Peng, Weiwei	Shenzhen University
14:30-14:50, Paper ThSeA-Session-A1.4 Causality-Inspired Domain Generalization Network for EEG-Based Mental Workload Classification	
Wang, Kangning	Institute of Automation, Chinese Academy of Sciences
Wang, Yanzi	Institute of Automation, Chinese Academy of Sciences
Wei, Wei	Institute of Automation, Chinese Academy of Sciences
Gao, Ying	Institute of Automation, Chinese Academy of Sciences
Qiu, Shuang	Institute of Automation, Chinese Academy of Sciences
He, Huiguang	Institute of Automation, Chinese Academy of Sciences
14:50-15:10, Paper ThSeA-Session-A1.5 Probing EEG Microstates: Simulation, Analysis, and Modulation	
Wang, Ming	Shenzhen University
Huang, Gan	Shenzhen University
Yang, Lei	Shenzhen Polytechnic University

Technical Program for Thursday November 20, 2025

ThSeA-Session-A2
Neurophysiological Signal Processing and Human Movement Analysis

Regular Session
Room 3: 305E

Chair: Noman Naseer, Air University

Co-chair: Zhong, Xiaolong, Shanghai Jiao Tong University

13:30-13:50, Paper ThSeA-Session-A2.1 Robust EEG Emotion Recognition Network Combining Spatial Feature Mapping and Fuzzy Labels	
Xu, JiaHao	University of Shanghai for Science and Technology
Li, Ao	University of Shanghai for Science and Technology
Yin, Zhong	University of Shanghai for Science and Technology
13:50-14:10, Paper ThSeA-Session-A2.2 Graph-Attentive Kolmogorov-Arnold Networks for Interpretable EEG Emotion Recognition	
Zhong, Xiaolong	Shanghai Jiao Tong University
Hirano, Yoshiharu	Shanghai Jiao Tong University
Wu, Fei	Shanghai Jiao Tong University
Yin, Zhong	University of Shanghai for Science and Technology
Liu, Gang	Shanghai Jiao Tong University
14:10-14:30, Paper ThSeA-Session-A2.3 Deep Learning Approach for Finger Tapping Classification: An fNIRS Study	
Zulfiqar, Osama	Air University
Akhter, Jamila	Air University
Abid, Urooj	Air University
Hammad, Nazeer	Air University
Naseer, Noman	Air University
14:30-14:50, Paper ThSeA-Session-A2.4 Feature Research on Aging Grading of Neuromotor Function Based on Surface Electromyography in the Elders	
Tong, Lina	China University of Mining and Technology (Beijing)
Ye, Mengjing	China University of Mining and Technology (Beijing)
Liu, Yuchen	China University of Mining and Technology (Beijing)
Wang, Chen	China University of Mining and Technology (Beijing)
Yu, Jing	China University of Mining and Technology (Beijing)
14:50-15:10, Paper ThSeA-Session-A2.5 Machine Learning Based Classification of Hand Movements Using sEMG and fNIRS Feature Fusion Technique	
Abid, Urooj	Air University
Zulfiqar, Osama	Air University
Akhter, Jamila	Air University Islamabad
Hammad, Nazeer	Air University
Naseer, Noman	Air University
15:10-15:30, Paper ThSeA-Session-A2.6 Lower Limb Motion Classification Using Surface Electromyography Based on CNN-Adam Model	
Guo, Fei	China Astronaut Research and Training Center
Huan, Shang	China Astronaut Research and Training Center
Xiong, Ying	China Astronaut Research and Training Center
Deng, Hua	China Astronaut Research and Training Center
Liu, Xiang	China Astronaut Research and Training Center
Lin, Wanhong	China Astronaut Research and Training Center

Technical Program for Thursday November 20, 2025

ThSeA-Session-A3
Human-Robot Collaboration and Human-AI Interaction Systems

Regular Session
Room 4: 305AB

Chair: Zhu, Xiaoqing, Beijing University of Technology
Co-chair: Shiying, Sun, Institute of Automation, Chinese Academy of Sciences

13:30-13:50, Paper ThSeA-Session-A3.1 Preparation Integration of Virtual Reality Gaming and Functional Electrical Stimulation for Upper Limb Rehabilitation	
Gao, Xiaolin	University of Shanghai for Science and Technology
Yang, Jiantao	University of Shanghai for Science and Technology
Yang, Hongjun	Institute of Automation, Chinese Academy of Sciences
13:50-14:10, Paper ThSeA-Session-A3.2 A Task Lifecycle-Driven Digital Twin Framework for Dynamic Human-Robot Collaboration in Healthcare	
Tang, Xu	Beijing University of Posts and Telecommunications
Linkun, Zhou	Beijing University of Posts and Telecommunications
Mo, Yadong	Beijing University of Posts and Telecommunications
Yin, Gefan	Beijing University of Posts and Telecommunications
Li, Jian	Beijing University of Posts and Telecommunications
Wei, ShiMin	Beijing University of Posts and Telecommunications
14:10-14:30, Paper ThSeA-Session-A3.3 Human-AI Agent Interaction Design towards Agentic Cockpits for Intelligent Vehicles: Framework and a Case Study	
Liu, Erxuan	Beijing Union University
Wu, Yingzhang	Tsinghua University
Guo, Yuxin	State Key Laboratory of Intelligent Green Vehicle and Mobility
Zhang, Wei	Li Auto
Li, Shuling	Li Auto
Xu, Cheng	Beijing Union University
Hu, Yaqi	Guangdong University of Technology
Cao, Dongpu	Tsinghua University
14:30-14:50, Paper ThSeA-Session-A3.4 Multi-Feature Voting and Illumination-Adaptive Face Tracking for Hexapod Robots	
Yan, Zijing	Beijing University of Technology
Zhu, Yaqiong	Beijing Union University
Zhou, Yuhang	Beijing University of Technology
Wu, Tong	CNNC Hexin Information Technology
Zhu, Xiaoqing	Beijing University of Technology
14:50-15:10, Paper ThSeA-Session-A3.5 A Substation Collaborative Inspection System Based on Ad-Hoc Network Communication Nodes	
Xu, Mingkai	State Grid Shandong Electric Power Company Jinan Power Supply Company
Pan, Huichao	State Grid Shandong Electric Power Company Jinan Power Supply Company
Wang, Siyuan	State Grid Shandong Electric Power Company Jinan Power Supply Company
Liu, Kuan	Institute of Automation, Chinese Academy of Sciences
Sun, Shiying	Institute of Automation, Chinese Academy of Sciences
15:10-15:30, Paper ThSeA-Session-A3.6 A Novel Method for Continuous Estimation of Multi-Joint Movements in Human Lower Limbs	
Li, Chuang	North China University of Technology
Sun, Ye	North China University of Technology
Li, Jiayi	Hebei GEO University
Li, Kexiang	North China University of Technology
Zhao, Yan	University of Science and Technology Beijing

Technical Program for Thursday November 20, 2025

ThSeA-Session-A4
Intelligent Decision Support and Fault Diagnosis Systems

Room 5: 308
Regular Session

Chair: Guo, Jiangzhen, Beihang University

Co-chair: Noman Naseer, Air University

13:30-13:50, Paper ThSeA-Session-A4.1 Assessment of Sensor-Based Physiological Markers for Health Workers' Stress-Level Identification through Machine Learning	
Farrukh, Fizza	Air University
Abid, Urooj	Air University
Zulfiqar, Osama	Air University
Naseer, Noman	Air University
13:50-14:10, Paper ThSeA-Session-A4.2 ShadowSense: Real-Time Environmental Analysis Via Dynamic Shadow Processing	
Mohammad Osama, Osama	Air University
Muhammad Adden, Adden	Air University
Rizwan Zahid, Rizwan	Air University
Naqash Ahmad, Naqash	Air University
Farrukh, Fizza	Air University
Hammad, Nazeer	Air University
Naseer, Noman	Air University
14:30-14:50, Paper ThSeA-Session-A4.4 Intelligent Fault Identification in Flight Vehicles Using Bayes Classifier with Dynamic Feature Optimization and Adaptive Model Selection (Online)	
Peng, Quanjing	Beijing Institute of Technology
Zhu, Huaishi	Beijing Institute of Technology
Wu, Jinyang	Singapore Management University
Cao, Fangfei	Beijing Institute of Technology
Fang, Xu	Dalian University of Technology
14:50-15:10, Paper ThSeA-Session-A4.5 A Comparative Analysis of Numerical and Structured Rating Scales for Evaluating Operator Competence Levels	
Skripnik, Valeriya	Ghent University
Hoedt, Steven	Ghent University
Aghezaf, El-Houssaine	Ghent University and Flanders Make
Cottyn, Johannes	Ghent University
15:10-15:30, Paper ThSeA-Session-A4.6 Intelligent Interventional Robotic System for Atrial Fibrillation Radiofrequency Ablation (Online)	
Yang, Anxin	Beihang University
Li, Jianchao	Beihang University
Guo, Jiangzhen	Beihang University

Technical Program for Thursday November 20, 2025

ThSeB-Session-B1
Human Performance and Cognitive Modeling in AI-Enabled Human-Machine Systems

Invited Session
Room 2: 305CD

Chair: Wang, Yihong, Xi'an Jiaotong-Liverpool University

Co-chair: Pan, Yushan, Xi'an Jiaotong-Liverpool University

16:00-16:20, Paper ThSeB-Session-B1.1 FSM vs. DRL: A Comparative Study of Enemy Behavior in Fighting Games (Online)	
Sun, Ran	Xi'an Jiaotong-Liverpool University
Chen, Baijun	Beijing University of Posts and Telecommunications
Xiang, Nan	Xi'an Jiaotong-Liverpool University
Xu, Zhijie	Xi'an Jiaotong-Liverpool University
16:20-16:40, Paper ThSeB-Session-B1.2 The Research Trends and Hot Topics in Security Governance of New Era Data-Entity Integration (Online)	
Xu, Gang	Xi'an Jiaotong-Liverpool University
Xiang, Nan	Xi'an Jiaotong-Liverpool University
Wang, Yihong	Xi'an Jiaotong-Liverpool University
Ma, Jieming	Xi'an Jiaotong-Liverpool University
Pan, Yushan	Xi'an Jiaotong-Liverpool University
Wei, Wang	Xi'an Jiaotong-Liverpool University
16:40-17:00, Paper ThSeB-Session-B1.3 Extending TAM with Trust and Collaboration: Understanding University Students' Interaction Pathways with Generative AI (Online)	
Li, Yuzhou	Xi'an Jiaotong-Liverpool University
Lyu, Sicheng	Xi'an Jiaotong-Liverpool University
Yang, Ruijie	Xi'an Jiaotong-Liverpool University
Zhu, Enze	Xi'an Jiaotong-Liverpool University
Zhang, Haonan	Xi'an Jiaotong-Liverpool University
Zheng, Hanjun	Xi'an Jiaotong-Liverpool University
Sun, Haitian	Xi'an Jiaotong-Liverpool University
Wang, Yihong	Xi'an Jiaotong-Liverpool University
17:00-17:20, Paper ThSeB-Session-B1.4 DynaFreq-SR: A Dynamic Spatially-Adaptive Network with Frequency-Domain Reconstruction for Chest X-Ray Super-Resolution(Online)	
Su, Yuanxin	Xi'an Jiaotong-Liverpool University
Thaiyal Bagam, Sanjeev	Xi'an Jiaotong-Liverpool University
Li, Hailing	Communication University of China
Xu, Zhijie	Xi'an Jiaotong-Liverpool University
Chen, Yangbin	Xi'an Jiaotong-Liverpool University
Zhang, Haiyang	Xi'an Jiaotong-Liverpool University
Wang, Yihong	Xi'an Jiaotong-Liverpool University
17:20-17:40, ThSeB-Session-B1.5 EMG-Driven Trajectory Deformation Algorithm for an Ankle Rehabilitation Robot via Voluntary Joint Torque Online Estimation	
Zhefen Zheng	Sun Yat-sen University
Rong Song	Sun Yat-sen University
Jie Zhou	Shenyang University of Technology
17:40-18:00, ThSeB-Session-B1.6 The Role of Prefrontal and Posterior Parietal Cortex on Saccade Kinetics (Online)	
Wenbo Ma	North Sichuan Medical University

Technical Program for Thursday November 20, 2025

ThSeB-Session-B2
Decoding and Control Methods in Brain-Computer Interaction

Regular Session
Room 3: 305E

Chair: Yin, Zhong, University of Shanghai for Science and Technology
Co-chair: Wang, Jiaxing, Institute of Automation, Chinese Academy of Sciences

16:00-16:20, Paper ThSeB-Session-B2.1 Cognitive Workload Recognition Using Hybrid Brain-Computer Interface and Channel Selection	
Huang, Yixiang	University of Shanghai for Science and Technology
Zhang, Hengqian	University of Shanghai for Science and Technology
Zhang, Jianhua	Oslo Metropolitan University
Yin, Zhong	University of Shanghai for Science and Technology
16:20-16:40, Paper ThSeB-Session-B2.2 An Adaptive Filterbank Graph Convolution Network for Motor Imagery EEG Decoding	
Dou, Yu	Inner Mongolia University of Technology
Dong, Chaoyi	Inner Mongolia University of Technology
Zhu, Xu	Inner Mongolia University of Technology
Chen, Gangqiang	Inner Mongolia University of Technology
u, Hongxin	Inner Mongolia University of Technology
Liu, JunTing	Inner Mongolia University of Technology
Chen, Xiao-Yan	Inner Mongolia University of Technology
16:40-17:00, Paper ThSeB-Session-B2.3 A Multi-Branch Deep Learning Architecture Combining GCN, Vision Transformer, and Mamba for SSVEP Signal Decoding	
Zhu, Xu	Inner Mongolia University of Technology
Chen, Xiao-Yan	Inner Mongolia University of Technology
Dong, Chaoyi	Inner Mongolia University of Technology
Dou, Yu	Inner Mongolia University of Technology
Chen, Gangqiang	Inner Mongolia University of Technology
Yu, Hongxin	Inner Mongolia University of Technology
Liu, JunTing	Inner Mongolia University of Technology
17:00-17:20, Paper ThSeB-Session-B2.4 A Hierarchical Brain-Computer Interface for Real-Time Mobile Robot Control	
Chen, Zhen	Nanjing University of Science and Technology
Zhou, Ruixi	Nanjing University of Science and Technology
Zhang, Xuchen	Nanjing University of Science and Technology
Zhou, Hui	Nanjing University of Science and Technology
17:20-17:40, Paper ThSeB-Session-B2.5 Design of Host Computer Platform for Visual BCI and Electrical Stimulation Control	
Yan, Hezhong	Carleton University
Su, Jianqiang	Institute of Automation, Chinese Academy of Sciences
Wang, Yihan	University of Chinese Academy of Sciences
Wang, Zhengqing	Memorial University of Newfoundland
Institute of Automation, Chinese Academy of Sciences	Institute of Automation, Chinese Academy of Sciences
Wang, Jiaxing	Institute of Automation, Chinese Academy of Sciences

Technical Program for Thursday November 20, 2025

ThSeB-Session-B3
Cognitive State Analysis and Human Performance Evaluation

Regular Session
Room 4: 305AB

Chair: Zhang,Chutian, Macau University of Science and Technology
Co-chair: Huang, Xiang, Institute of Automation, Chinese Academy of Science

16:00-16:20, Paper ThSeB-Session-B3.1 Modeling Sensory/Perception Changes Hypothesis in Alzheimer's Dementia Patient	
Uchiyama, Emiko	The University of Tokyo
Hisakata, Rumi	Science Tokyo
Umeda-Kameyama, Yumi	The University of Tokyo Hospital
Nanao-Hamai, Michiko	The University of Tokyo Hospital
16:20-16:40, Paper ThSeB-Session-B3.2 Dynamic Multi-Task Brain Network Analysis in Parkinson's Disease Based on ICA	
Hu, YanKun	Nankai University
Cheng, Yuan yuan	Tianjin Huanhu Hospital
Zhang, Xinyuan	Nankai University
Li, Weihua	Tianjin Huanhu Hospital
Wu, Jialing	Tianjin Huanhu Hospital
Yu, Ningbo	Nankai University
16:40-17:00, Paper ThSeB-Session-B3.3 Multimodal Deep Learning-Based EEG Health Scoring Model for Mild Cognitive Impairment	
Wu, Xiaotian	Chengde Medical University
Huang, Qun	Chengde Medical University
Liu, Yanli	Chengde Medical University
Dong, Xianling	Chengde Medical University
Liu, Haining	Chengde Medical University
Wen, Dong	University of Science and Technology Beijing
17:00-17:20, Paper ThSeB-Session-B3.4 Automatic Analysis of Blinking Abnormalities in Parkinson's Disease	
Tan, Zhiyuan	Dalian University
Zhao, Jie	Affiliated Zhongshan Hospital of Dalian University
Kong, Liwen	Dalian University
Song, Qinfen	Dalian University Affiliated Xinhua Hospital
Zou, Qijie	State Key Laboratory for Autonomous Underwater Vehicle
Lv, Yana	Dalian University
Liang, Shanshan	Affiliated Zhongshan Hospital of Dalian University
Tao, Shuai	Dalian University
17:20-17:40, Paper ThSeB-Session-B3.5 Handling Label Correlations and Data Imbalance in Parkinson's Motor and Cognitive Simultaneous Subtyping	
Zhang, Chutian	Macau University of Science and Technology
Yang, Hongjun	Institute of Automation, Chinese Academy of Sciences
Hou, Zeng-Guang	Institute of Automation, Chinese Academy of Sciences
17:40-18:00, Paper ThSeB-Session-B3.6 Personalized Levodopa Prescription Using Hybrid Reinforcement Learning in Parkinson's Disease	
Huang, Xiang	Institute of Automation, Chinese Academy of Sciences
Wang, Wenkai	Institute of Automation, Chinese Academy of Sciences
Yang, Hongjun	Institute of Automation, Chinese Academy of Sciences
Hou, Zeng-Guang	Institute of Automation, Chinese Academy of Sciences

Author Index

A	
Abid, Urooj	ThSeA-Session-A2.3
	ThSeA-Session-A2.5
	ThSeA-Session-A4.1
Aghezzaf, El-Houssaine	ThSeA-Session-A4.5
Akhter, Jamila	TuSeB-Session-B1.6
	ThSeA-Session-A2.3
	ThSeA-Session-A2.5
Alsos, Ole Andreas	TuSeA-Session-A1.2
An, Tianjiao	WeSeA-Session-A4.1
	WeSeA-Session-A4.2
B	
Bai, Xiaoshan	TuSeA-Session-A2
Ban, Weilong	TuSeA-Session-A4.3
Bao, Tianzhe	TuSeB-Session-B4.4
Breivik, Morten	TuSeA-Session-A1.2
Buscarino, Arturo	WeSeA-Session-A2.3
C	
Cai, Xin	TuSeB-Session-B1.2
Cao, Dongpu	ThSeA-Session-A3.3
Cao, Fangfei	WeSeB-Session-B3.1
	ThSeA-Session-A4.4
Cao, Wei	TuSeB-Session-B4.4
Carlson, Tom	WeSeA-Session-A1.2
Chen, Baijun	ThSeB-Session-B1.1
Chen, Chuwen	ThSeA-Session-A1.2
Chen, Dandan	WeSeB-Session-B1.6
Chen, Fengjie	WeSeA-Session-A4.4
Chen, Gangqiang	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
Chen, Mengya	TuSeB-Session-B2.1
Chen, Pu	WeSeA-Session-A3.6
Chen, Shihao	ThSeA-Session-A1.2
Chen, Wenbai	TuSeB-Session-B4.2
Chen, Xianggui	WeSeB-Session-B3.6
Chen, Xiao-Yan	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
Chen, Xiaogang	ThSeA-Session-A1.1
Chen, Xiaoling	TuSeB-Session-B2
	TuSeB-Session-B2.2
	TuSeB-Session-B2.4
Chen, Xinda	WeSeB-Session-B4.3
Chen, Xinxing	TuSeA-Session-A3
	TuSeA-Session-A3.6
Chen, Yangbin	ThSeB-Session-B1
	ThSeB-Session-B1.4
Chen, Zhen	ThSeB-Session-B2.4
Cheng, Guo	TuSeB-Session-B3.2
Cheng, Hong	WeSeB-Session-B1.4
Cheng, Jintao	TuSeA-Session-A4.1
Cheng, Qingyuan	WeSeB-Session-B2.2
Cheng, Yuanyuan	ThSeB-Session-B3.2
Chi, Ming	WeSeA-Session-A2.2
Cho, Youngjun	WeSeA-Session-A1.2
Chochul, Miroslav	TuSeB-Session-B1.4
Chu, Ruichen	TuSeB-Session-B3.2
Cong, Xiaodan	WeSeB-Session-B2.6
Cottyn, Johannes	ThSeA-Session-A4.5
Cui, Liangyu	WeSeA-Session-A4.3

D	
Deng, Hua	ThSeA-Session-A2.6
Deng, Xiaofan	WeSeA-Session-A4.3
Dong, Bo	WeSeA-Session-A4.1
	WeSeA-Session-A4.2
Dong, Chaoyi	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
Dong, Mingjie	WeSeB-Session-B2
	WeSeB-Session-B2.3
Dong, Ruiyang	TuSeB-Session-B1.2
Dong, Xianling	ThSeB-Session-B3.3
Dou, Yu	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
Du, Wenxiang	TuSeA-Session-A4.3
Du, Zhe	TuSeA-Session-A2.4
Duan, Xingguang	WeSeA-Session-A3.6
E	
Enjalbert, Simon	WeSeB-Session-B1.3
Erlandsen, Magne Johannes	TuSeA-Session-A1.2
F	
Fan, Xiaoyue	WeSeB-Session-B1.1
Fan, Yubo	WeSeA-Session-A4.6
Fan, Zhun	TuSeB-Session-B4.6
Fang, Bin	WeSeA-Session-A3
Fang, Ting	WeSeA-Session-A3.2
Fang, Xu	ThSeA-Session-A4.4
Fang, Zhenlu	TuSeA-Session-A4.3
Farrukh, Fizza	ThSeA-Session-A4.1
	ThSeA-Session-A4.2
Fazhan, Li	WeSeA-Session-A4.5
Fei, Fei	WeSeA-Session-A3.2
Feng, Yun	WeSeA-Session-A2
	WeSeA-Session-A2
Fiarrmini, Francesco	WeSeB-Session-B1.3
Fuchs, Robert	TuSeB-Session-B3.5
G	
Gai, Xiaojian	TuSeB-Session-B4.3
Gan, Piao	TuSeB-Session-B4.6
Gao, Guowei	TuSeB-Session-B4.2
Gao, Xiaolin	ThSeA-Session-A3.1
Gao, Ying	ThSeA-Session-A1.4
Gao, Yu	TuSeA-Session-A3.5
	TuSeB-Session-B4.1
Gong, Yizhou	TuSeA-Session-A1.1
	WeSeB-Session-B4.5
Guan, Lianwu	WeSeB-Session-B2.6
Guo, Fei	ThSeA-Session-A2.6
Guo, Jiangzhen	ThSeA-Session-A4
	ThSeA-Session-A4.6
Guo, Jinbin	TuSeB-Session-B4.1
Guo, Peng	WeSeB-Session-B3.6
Guo, Yuxin	ThSeA-Session-A3.3
Guo, Zhao	TuSeA-Session-A1.6
Gusev, Alexey	TuSeA-Session-A1.2

Author Index

H		J	
Hammad, Nazeer	TuSeB-Session-B1.6	Ji, Haoyu	TuSeB-Session-B4.1
	ThSeA-Session-A2.3	Ji, Yuanlong	WeSeA-Session-A4.6
	ThSeA-Session-A2.5	Ji, Zebin	WeSeA-Session-A4.1
	ThSeA-Session-A4.2		WeSeA-Session-A4.2
Han, Shuai	TuSeB-Session-B2.3	Jia, Zhilan	WeSeA-Session-A2.2
Han, Shuochen	WeSeB-Session-B3.5	Jiacai, Huang	WeSeA-Session-A3.1
Han, Xiao	TuSeA-Session-A4.3	Jiaju, Wang	TuSeB-Session-B3.4
Han, Zhiji	WeSeA-Session-A2	Jiang, Hong	TuSeA-Session-A4.5
Hashioka, Daisuke	TuSeB-Session-B3.5	Jiang, Hucheng	WeSeA-Session-A4.1
He, Bingwei	WeSeB-Session-B3.2	Jiang, Jingyan	WeSeB-Session-B3.3
He, Huiguang	ThSeA-Session-A1.4	Jiang, Weizhong	TuSeA-Session-A3.2
He, Linpu	WeSeB-Session-B1.4	Jiang, Yi	TuSeA-Session-A4
He, Shude	TuSeA-Session-A2.3	Jiaqing, Yan	TuSeB-Session-B3.4
He, Wei	TuSeB-Session-B1.2	Jiaxing, Wang	TuSeB-Session-B2.3
	WeSeA-Session-A2.4		ThSeB-Session-B2.5
He, Yangjie	WeSeB-Session-B1.2	Jin, Richu	ThSeA-Session-A1.2
He, Yongzheng	WeSeA-Session-A3.6	Jing, Fengshui	WeSeB-Session-B4.2
He, Zexi	WeSeB-Session-B1.2	Jing, Haibo	WeSeA-Session-A3.6
He, Zhengqing	WeSeB-Session-B2.4	Jing, Yitao	TuSeA-Session-A1.5
He, Zhijian	TuSeA-Session-A4.1	Jubo, Wang	WeSeA-Session-A4.5
	WeSeB-Session-B3.3	K	
Hirano, Yoshiharu	ThSeA-Session-A2.2	Kang, Xuliang	TuSeA-Session-A2.1
Hiraoka, Toshihiro	WeSeA-Session-A1.1		TuSeA-Session-A2.2
Hisakata, Rumi	ThSeB-Session-B3.1	Karpiš, Ondrej	TuSeB-Session-B1.4
Hoedt, Steven	ThSeA-Session-A4.5		TuSeB-Session-B3.6
Hohmann, Soeren	TuSeB-Session-B1.3	Kefan, Zhang	TuSeB-Session-B3.4
	WeSeA-Session-A1.4	Kille, Sean	TuSeB-Session-B1.3
Hong, Wei	WeSeB-Session-B1.2	Kong, Linghuan	WeSeA-Session-A2.4
Hou, Bojie	WeSeB-Session-B2.1	Kong, Liwen	TuSeB-Session-B2.5
Hou, Jun	WeSeB-Session-B4.2		ThSeB-Session-B3.4
Hou, Zeng-Guang	TuSeA-Session-A4.5	Kuang, Yiqun	WeSeB-Session-B1.4
	TuSeB-Session-B2.1	Kubaščík, Michal	TuSeB-Session-B1.4
	WeSeA-Session-A4.4		TuSeB-Session-B3.6
	ThSeB-Session-B3.5	L	
	ThSeB-Session-B3.6	La Spina, Giuseppe	WeSeA-Session-A2.3
Hu, Bin	TuSeA-Session-A1.5	Lao, Junjie	TuSeB-Session-B4.6
Hu, Kang	WeSeA-Session-A2.4	Leng, Yuquan	TuSeA-Session-A3
Hu, Wenfeng	WeSeB-Session-B4		TuSeA-Session-A3.4
	WeSeB-Session-B4.1	Li, Ao	ThSeA-Session-A2.1
Hu, YanKun	ThSeB-Session-B3.2	Li, Changsheng	WeSeA-Session-A3.6
Hu, Yaqi	ThSeA-Session-A3.3	Li, Chengyang	WeSeB-Session-B3.5
Huan, Shang	ThSeA-Session-A2.6	Li, Chuang	ThSeA-Session-A3.6
Huang, Gan	ThSeA-Session-A1.5	Li, Cong	TuSeA-Session-A4.2
Huang, Hansheng	TuSeA-Session-A4.4	Li, Hailing	ThSeB-Session-B1.4
Huang, Houming	TuSeA-Session-A2.4	Li, Hui	WeSeB-Session-B2.5
Huang, Jian	TuSeA-Session-A3.6	Li, Jian	ThSeA-Session-A3.2
Huang, Jian	TuSeB-Session-B4.1	Li, Jianchao	ThSeA-Session-A4.6
Huang, Qun	ThSeB-Session-B3.3	Li, Jianfeng	WeSeB-Session-B2.3
Huang, Rui	WeSeB-Session-B1.4	Li, Jiayi	ThSeA-Session-A3.6
Huang, Wenze	TuSeB-Session-B4.1	Li, Jing	TuSeA-Session-A3.3
Huang, Xiang	ThSeB-Session-B3	Li, Junhua	TuSeA-Session-A4.4
	ThSeB-Session-B3.6	Li, Kexiang	ThSeA-Session-A3.6
Huang, Yixiang	ThSeB-Session-B2.1	Li, Mingyu	TuSeB-Session-B2.4
		Li, Qing	WeSeB-Session-B1.1
		Li, Shuling	ThSeA-Session-A3.3
		Li, Shuo	TuSeA-Session-A4.5

Author Index

L	
Li, Weibin	TuSeA-Session-A4.1
Li, Weihua	ThSeB-Session-B3.2
Li, Xiang	WeSeB-Session-B3.4
Li, Xiaodong	ThSeA-Session-A1.2
	ThSeA-Session-A1.3
Li, Xiaoyun	ThSeA-Session-A1.2
	ThSeA-Session-A1.3
Li, Xin	TuSeA-Session-A4.2
Li, Yao	TuSeB-Session-B4.2
Li, Yong	WeSeA-Session-A2.4
Li, Yuzhou	ThSeB-Session-B1.3
Li, Zeyi	TuSeB-Session-B2.1
Liang, Jingkai	WeSeA-Session-A4.1
	WeSeA-Session-A4.2
Liang, Shanshan	TuSeB-Session-B2.5
	ThSeB-Session-B3.4
Liang, Xu	WeSeB-Session-B2
	WeSeB-Session-B2.5
Liang, Xueqian	TuSeB-Session-B4.4
Liang, Zhe	TuSeB-Session-B3.2
Lin, Haosong	WeSeA-Session-A4.4
Lin, Hongkun	TuSeA-Session-A2.2
Lin, Tianyu	TuSeA-Session-A1.5
Lin, Wanhong	ThSeA-Session-A2.6
Ling, Youquan	WeSeB-Session-B2.1
Linkun, Zhou	ThSeA-Session-A3.2
Liu, Chunming	TuSeA-Session-A4.2
Liu, Erxuan	ThSeA-Session-A3.3
Liu, Feifei	WeSeB-Session-B3.3
Liu, Gang	ThSeA-Session-A2.2
Liu, Hailong	WeSeA-Session-A1.1
Liu, Haining	ThSeB-Session-B3.3
Liu, Haoxin	TuSeA-Session-A1.6
Liu, Honghai	TuSeA-Session-A3.5
Liu, Jinfu	WeSeB-Session-B2.5
Liu, JunTing	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
Liu, Keping	TuSeA-Session-A1.3
Liu, Kuan	ThSeA-Session-A3.5
Liu, Ruoyuan	WeSeB-Session-B2.3
Liu, Shi-Qi	TuSeA-Session-A4.5
	TuSeB-Session-B1.1
	WeSeA-Session-A4.4
	WeSeA-Session-A4.6
Liu, Wenjing	ThSeA-Session-A2.6
Liu, Xiang	WeSeB-Session-B2.6
Liu, Xiaoxi	TuSeA-Session-A1.6
Liu, Xingzhuo	TuSeA-Session-A1.6
Liu, Yalun	TuSeA-Session-A1.6
Liu, Yang	TuSeB-Session-B3.4
Liu, Yanli	ThSeB-Session-B3.3
Liu, Yongbai	TuSeA-Session-A1.3
Liu, Yongxiang	WeSeB-Session-B1.4
Liu, Yuchen	TuSeB-Session-B2.6
	ThSeA-Session-A2.4
Liu, Zeyu	TuSeA-Session-A1.5
Liu, Zhaoyuan	TuSeA-Session-A3.2

Liu, Zhi-Wei	WeSeA-Session-A2.2
Liu, Zhijie	TuSeA-Session-A2.1
	TuSeA-Session-A2.2
	TuSeB-Session-B1.2
	WeSeA-Session-A2
Liu, Zhou-Yang	WeSeB-Session-B1.5
Long, Xingju	TuSeA-Session-A4.4
Lu, Hanxuan	WeSeB-Session-B1.2
Lu, Qirong	WeSeB-Session-B3.3
Lun, Qinglong	WeSeB-Session-B2.3
Luo, Jiehao	TuSeA-Session-A4.1
Luo, Shan	WeSeA-Session-A3
Luo, Zhiling	TuSeA-Session-A4.5
Lv, Dong	TuSeA-Session-A3.2
Lv, Yana	TuSeB-Session-B2.5
	ThSeB-Session-B3.4
Lv, Zeping	TuSeB-Session-B2.2
	TuSeB-Session-B2.4
Lyu, Sicheng	ThSeB-Session-B1.3

M	
Ma, Bing	WeSeA-Session-A4.1
	WeSeA-Session-A4.2
Ma, Dongtao	WeSeB-Session-B2.1
Ma, Jieming	ThSeB-Session-B1.2
Ma, Xiyao	WeSeA-Session-A4.4
Ma, Yunkai	WeSeB-Session-B4.2
Mao, Yicheng	WeSeB-Session-B3.6
Meng, Deyuan	WeSeB-Session-B2.2
Merlevede, Jean-Valentin	WeSeB-Session-B1.3
Mingyue, Niu	TuSeB-Session-B4.2
Mo, Yadong	ThSeA-Session-A3.2
Mohammad Osama, Osama	ThSeA-Session-A4.2
Muhammad Adden, Adden	ThSeA-Session-A4.2

N	
Na, Xiaodong	TuSeB-Session-B4.4
Naeem, Rehan	TuSeB-Session-B1.6
Nakade, Tomohiro	TuSeB-Session-B3.5
Nakano, Kimihiko	WeSeB-Session-B3.4
Nanao-Hamai, Michiko	ThSeB-Session-B3.1
Naqash Ahmad, Naqash	ThSeA-Session-A4.2
Naseer, Noman	TuSeB-Session-B1.6
	ThSeA-Session-A2
	ThSeA-Session-A2.3
	ThSeA-Session-A2.5
	ThSeA-Session-A4
	ThSeA-Session-A4.1
	ThSeA-Session-A4.2

O	
Ohta, Atsushi	WeSeA-Session-A1.1
Ouyang, Gaoxiang	TuSeA-Session-A3.3
Ouyang, Wenbin	TuSeA-Session-A4.5

Author Index

P

Pan, Huichao	ThSeA-Session-A3.5
Pan, Shuyuan	WeSeB-Session-B3.1
Pan, Xiangbin	TuSeA-Session-A4.5
Pan, Yushan	ThSeB-Session-B1
	ThSeB-Session-B1.2
Panchea, Adina Marlana	TuSeB-Session-B1.3
Pang, Muye	TuSeB-Session-B3.3
Pang, Zaikiang	WeSeA-Session-A2.1
Peng, Cheng	TuSeB-Session-B4.5
Peng, Li	WeSeA-Session-A4.5
Peng, Quanjing	ThSeA-Session-A4.4
Peng, Weiwei	ThSeA-Session-A1
	ThSeA-Session-A1.2
	ThSeA-Session-A1.3
Peng, Zhinan	WeSeB-Session-B1.4
Petermann, Felix-Marcel	TuSeA-Session-A1.2

Q

Qian, Kui	WeSeA-Session-A3.1
Qiao, Jingchao	TuSeA-Session-A2.4
Qiao, Junfei	WeSeB-Session-B4.4
Qin, Guangsheng	TuSeA-Session-A4.4
Qiu, Shuang	ThSeA-Session-A1
	ThSeA-Session-A1
	ThSeA-Session-A1.4
Qiu, Xinan	WeSeB-Session-B2.1

R

Ren, Weihong	TuSeA-Session-A3.5
Rizwan Zahid, Rizwan	ThSeA-Session-A4.2
Rongjie, Chen	TuSeA-Session-A4.4
Ruan, Zhihu	WeSeA-Session-A3.1

S

Sato, Eito	WeSeA-Session-A1.3
Schneider, Julian	WeSeA-Session-A1.4
Shao, Yiming	ThSeA-Session-A1.1
Shen, Chenpu	WeSeB-Session-B2.5
Shen, Yang	WeSeA-Session-A1.4
Shi, Ping	TuSeA-Session-A3.1
Shi, Weiguo	TuSeA-Session-A1.5
Shi, Yan	TuSeB-Session-B4.2
Shiying, Sun	ThSeA-Session-A3
	ThSeA-Session-A3.5
Skripnik, Valeriya	ThSeA-Session-A4.5
Song, Changjiang	WeSeB-Session-B2.6
Song, Qinfen	TuSeB-Session-B2.5
	ThSeB-Session-B3.4
Song, Ruizhuo	WeSeB-Session-B1.1
Song, Yu	WeSeA-Session-A4.6
Su, Jianqiang	TuSeA-Session-A1.5
	ThSeB-Session-B2.5
Su, Tingting	WeSeB-Session-B2.4
Su, Yuanxin	ThSeB-Session-B1.4
Su, Zhenyu	TuSeB-Session-B3.3
Sun, Haitian	ThSeB-Session-B1.3
Sun, Ran	ThSeB-Session-B1.1
Sun, Siwen	WeSeB-Session-B2.6
Sun, Tairen	TuSeB-Session-B1.5

Sun, Tairen	TuSeB-Session-B2.1
Sun, Ye	ThSeA-Session-A3.6
Sun, Yue	TuSeB-Session-B3.1
Sun, Zhongbo	WeSeA-Session-A2.1

T

Tan, Xiaowei	TuSeA-Session-A3.2
Tan, Zhiyuan	ThSeB-Session-B3.4
Tang, Guohan	WeSeB-Session-B4.4
Tang, Xiaoyu	TuSeA-Session-A4.1
	WeSeB-Session-B3.3
Tang, Xu	ThSeA-Session-A3.2
Tao, Shuai	TuSeB-Session-B2.5
	ThSeB-Session-B3.4
Thaiyal Bagam, Sanjeev	ThSeB-Session-B1.4
Thomas, Alexander	WeSeA-Session-A1.2
Tian, Bing	WeSeB-Session-B1.6
Tian, Geng	WeSeB-Session-B1.6
Tian, Jiexi	WeSeA-Session-A3.6
Tian, Yunzhi	TuSeB-Session-B3.4
Tong, Lina	TuSeB-Session-B2.6
	ThSeA-Session-A2.4
Tufte, Andreas Gudahl	TuSeA-Session-A1.2
Tupý, Andrej	TuSeB-Session-B1.4

U

Uchiyama, Emiko	ThSeB-Session-B3.1
Umeda-Kameyama, Yumi	

V

Vanderhaegen, Frédéric	WeSeB-Session-B1.3
Varga, Balint	WeSeA-Session-A1
	WeSeA-Session-A1.4
Veitch, Erik	TuSeA-Session-A1.2

W

Wada, Takahiro	WeSeA-Session-A1
	WeSeA-Session-A1
	WeSeA-Session-A1.1
	WeSeA-Session-A1.3
Wang, Changwei	TuSeB-Session-B4.5
Wang, Chen	ThSeA-Session-A2.4
Wang, Chenchao	WeSeB-Session-B2.2
Wang, Ding	WeSeB-Session-B4.4
Wang, Feng	WeSeB-Session-B1.5
Wang, Gang	TuSeA-Session-A1.3
Wang, HaoZhe	WeSeB-Session-B3.3
Wang, Heng	WeSeA-Session-A3.2
Wang, Jiaxing	TuSeA-Session-A1.5
	ThSeB-Session-B2
Wang, Jun-Wei	WeSeB-Session-B1.5
Wang, Kangning	ThSeA-Session-A1.4
Wang, Mian	WeSeB-Session-B1.1
Wang, Ming	ThSeA-Session-A1.5
Wang, Shibo	WeSeB-Session-B3.2
Wang, Shubo	TuSeB-Session-B4.3
Wang, Siyuan	ThSeA-Session-A3.5
Wang, Weiqun	TuSeA-Session-A1.5
Wang, Wenkai	TuSeB-Session-B2.1
	ThSeB-Session-B3.6
Wang, Xin	ThSeA-Session-A1.3

Author Index

W			
Wang, Xuwei	WeSeB-Session-B4.5	Xiao, Li	ThSeB-Session-B1.2
Wang, Yan	WeSeB-Session-B2.4	Xiao, Tengfei	WeSeA-Session-A3.1
Wang, Yang	TuSeA-Session-A1.1	Xie, Ping	TuSeA-Session-A3.3
Wang, Yang	TuSeB-Session-B4.5	Xie, Xiao-Liang	TuSeB-Session-B2.2
Wang, Yang	WeSeB-Session-B4		TuSeA-Session-A4.5
	WeSeB-Session-B4.5	Xing, Shiyu	WeSeA-Session-A4.4
Wang, Yanyan	WeSeB-Session-B3.5	Xing, Xin	WeSeB-Session-B4.2
Wang, Yanzi	ThSeA-Session-A1.4	Xiong, Nanxiang	TuSeA-Session-A3.1
Wang, Yihong	ThSeB-Session-B1	Xiong, Pengwen	TuSeA-Session-A1.6
	ThSeB-Session-B1		WeSeA-Session-A3
	ThSeB-Session-B1.2	Xiong, Ying	WeSeA-Session-A3
	ThSeB-Session-B1.3	Xu, Chang	ThSeA-Session-A2.6
	ThSeB-Session-B1.4	Xu, Changxian	TuSeB-Session-B4.3
Wang, Zenghui	TuSeA-Session-A1.3		TuSeA-Session-A1.3
Wang, Zhengqing	TuSeB-Session-B2.3	Xu, Cheng	WeSeA-Session-A2.1
	ThSeB-Session-B2.5	Xu, Chunling	ThSeA-Session-A3.3
Wang, Zhiyong	TuSeA-Session-A3.3	Xu, Gang	WeSeA-Session-A2.1
	TuSeA-Session-A3.5	Xu, Haoran	ThSeB-Session-B1.2
	TuSeB-Session-B4.1	Xu, Jiahao	TuSeA-Session-A3.5
Wang, Zhonghao	WeSeB-Session-B3.5	Xu, Jiajun	ThSeA-Session-A2.1
Wei, Benzheng	TuSeB-Session-B4.4	Xu, Mingkai	WeSeB-Session-B2.5
Wei, Fangcan	TuSeB-Session-B1.1		TuSeA-Session-A4.2
	ThSeB-Session-B2.5	Xu, Minpeng	ThSeA-Session-A3.5
Wei, ShiMin	ThSeA-Session-A3.2	Xu, Wei	ThSeA-Session-A1
Wei, Wang	ThSeB-Session-B1.2	Xu, Wenhang	TuSeA-Session-A1.6
Wei, Wei	ThSeA-Session-A1.4	Xu, Yong	TuSeA-Session-A1.6
Wei, Zejun	WeSeB-Session-B3.3	Xu, Zhijie	TuSeA-Session-A2
Welao, Zhou	TuSeB-Session-B3.4		ThSeB-Session-B1.1
Wen, Dong	ThSeB-Session-B3.3	Xu, Zirui	ThSeB-Session-B1.4
Wen, Hao	WeSeA-Session-A3.6	Xu, Zixuan	WeSeB-Session-B1.2
Wen, Yiyang	WeSeB-Session-B3.3	Xue, Jiameng	WeSeA-Session-A4.2
Weng, Yan	TuSeA-Session-A2.3		WeSeA-Session-A3.1
Wu, Changcheng	WeSeA-Session-A3.2	Y	
Wu, Fei	ThSeA-Session-A2.2	Yan, Hezhong	TuSeB-Session-B2.3
Wu, Jialing	ThSeB-Session-B3.2		ThSeB-Session-B2.5
Wu, Jin	TuSeA-Session-A4	Yan, Shi	WeSeB-Session-B2.1
	TuSeA-Session-A4.1	Yan, Shualizheng	WeSeB-Session-B3
Wu, Jinyang	ThSeA-Session-A4.4		WeSeB-Session-B3.2
Wu, Junhui	WeSeA-Session-A3.1	Yan, Zijing	ThSeA-Session-A3.4
Wu, Lin	TuSeB-Session-B4.4	Yang, Anxin	ThSeA-Session-A4.6
Wu, Peiliang	TuSeB-Session-B4	Yang, Gaofu	WeSeB-Session-B1.1
	TuSeB-Session-B4.2	Yang, Hongjun	TuSeA-Session-A1.4
Wu, Songyan	TuSeB-Session-B3.1		TuSeB-Session-B2.1
Wu, Tong	ThSeA-Session-A3.4		ThSeA-Session-A3.1
Wu, Xiaoliang	TuSeA-Session-A4.4		ThSeB-Session-B3.5
Wu, Xiaotian	ThSeB-Session-B3.3	Yang, Jiantao	ThSeB-Session-B3.6
Wu, YIFan	WeSeA-Session-A2.4		TuSeA-Session-A1.4
Wu, Yingzhang	ThSeA-Session-A3.3		TuSeA-Session-A3.1
Wu, Yuanqing	TuSeB-Session-B4.4		TuSeB-Session-B2.1
Wu, Zhengxing	WeSeB-Session-B3.2	Yang, Jiayu	ThSeA-Session-A3.1
X		Yang, Lei	TuSeB-Session-B1.1
Xia, Lina	WeSeB-Session-B1.1		ThSeA-Session-A1.5
Xian, Haolan	TuSeA-Session-A3.4	Yang, Ming	ThSeA-Session-A1.5
Xiang, Kexin	TuSeA-Session-A1.5	Yang, Ruijie	WeSeB-Session-B2.6
Xiang, Nan	ThSeB-Session-B1	Yang, Xingbang	ThSeB-Session-B1.3
	ThSeB-Session-B1.1	Yang, Zhihao	WeSeA-Session-A4.6
			TuSeB-Session-B4.1

Author Index

Y			
Yao, Chenqi	WeSeB-Session-B4.1	Zhang, Mingming	TuSeA-Session-A3
Ye, Mengjing	ThSeA-Session-A2.4	Zhang, Wei	TuSeA-Session-A4.1
Yi, Shuowen	TuSeA-Session-A1.6	Zhang, Wei	ThSeA-Session-A3.3
Yihan, Wang	TuSeB-Session-B2.3	Zhang, Xinyuan	ThSeB-Session-B3.2
	ThSeB-Session-B2.5	Zhang, Xiuyu	WeSeB-Session-B1.6
Yin, Gefan	ThSeA-Session-A3.2	Zhang, Xuchen	ThSeB-Session-B2.4
Yin, Guodong	WeSeB-Session-B4.3	Zhang, Yuanwen	TuSeA-Session-A3.4
Yin, Kaixuan	WeSeB-Session-B1.1	Zhang, Zexu	WeSeB-Session-B3.6
Yin, Zhong	ThSeA-Session-A2.1	Zhao, Bo	WeSeA-Session-A4
	ThSeA-Session-A2.2		WeSeA-Session-A4
	ThSeB-Session-B2	Zhao, Chenru	TuSeA-Session-A4.3
	ThSeB-Session-B2.1	Zhao, Dongdong	WeSeB-Session-B2.1
Yongsheng, Xu	WeSeA-Session-A4.5	Zhao, Guangyin	TuSeA-Session-A3.6
Yu, Dan	TuSeA-Session-A1.4	Zhao, Hongfei	TuSeB-Session-B3.1
Yu, Hongnian	WeSeB-Session-B2.4	Zhao, Hubin	WeSeA-Session-A1.2
Yu, Hongxin	ThSeB-Session-B2.2	Zhao, Jie	TuSeB-Session-B2.5
	ThSeB-Session-B2.3		ThSeB-Session-B3.4
Yu, Jing	ThSeA-Session-A2.4	Zhao, Jingxin	WeSeB-Session-B2.3
Yu, Junzhi	WeSeB-Session-B3.2	Zhao, Liming	TuSeA-Session-A1.3
Yu, Ningbo	TuSeB-Session-B3.2		WeSeA-Session-A2.1
	ThSeB-Session-B3.2	Zhao, Luna	TuSeA-Session-A4.3
Yu, Wenzhao	TuSeA-Session-A2.4		WeSeA-Session-A4.5
Yu, Xinbo	WeSeA-Session-A2.4	Zhao, Xingang	TuSeA-Session-A3.2
Yuan, Menghao	WeSeB-Session-B2.4	Zhao, Yan	ThSeA-Session-A3.6
Yue, Chuqiao	TuSeA-Session-A1.6	Zhao, Yanzhi	TuSeB-Session-B3
Yue, ZeRan	WeSeA-Session-A3.2		TuSeB-Session-B3.1
Z			
Zeng, Fuqiang	TuSeB-Session-B3.3	Zhao, Zhijia	TuSeA-Session-A2
Zeng, Juntian	TuSeB-Session-B1.1		TuSeA-Session-A2.1
Zeng, Yixiang	TuSeA-Session-A2.1		TuSeA-Session-A2.2
	TuSeA-Session-A2.2	Zheng, Hanjun	TuSeA-Session-A2.3
Zhang, Bi	TuSeA-Session-A3.2	Zheng, Hongliang	ThSeB-Session-B1.3
Zhang, Chutian	ThSeB-Session-B3	Zheng, Jiawen	ThSeA-Session-A1.1
	ThSeB-Session-B3.5	Zheng, Quan	TuSeB-Session-B4.6
Zhang, Di	TuSeA-Session-A2.3	Zheng, Yan	WeSeA-Session-A4.6
Zhang, Dong	TuSeB-Session-B2.2	Zhong, Junjie	TuSeA-Session-A1.4
Zhang, Dongxu	TuSeB-Session-B1.1	Zhong, Xiaolong	WeSeA-Session-A4.3
	WeSeA-Session-A4		ThSeA-Session-A2
Zhang, Guochang	WeSeB-Session-B3.5		ThSeA-Session-A2.2
Zhang, Guotong	TuSeA-Session-A3.4	Zhou, Hui	ThSeB-Session-B2.4
Zhang, Haiyang	ThSeB-Session-B1	Zhou, Mengnan	WeSeA-Session-A4.6
	ThSeB-Session-B1.4	Zhou, Ruixi	ThSeB-Session-B2.4
Zhang, Haohao	TuSeB-Session-B2.4	Zhou, Xi	TuSeA-Session-A4.4
Zhang, Haonan	ThSeB-Session-B1.3	Zhou, Xiao-Hu	TuSeA-Session-A4.5
Zhang, Heng	TuSeA-Session-A1.1		WeSeA-Session-A4.4
	WeSeB-Session-B4.5	Zhou, Yuhang	ThSeA-Session-A3.4
Zhang, Hengqian	ThSeB-Session-B2.1	Zhou, Yuxuan	TuSeB-Session-B3.2
Zhang, Huili	TuSeB-Session-B2.2	Zhu, Enze	ThSeB-Session-B1.3
	TuSeB-Session-B2.4	Zhu, Guoqiang	WeSeB-Session-B1
	WeSeA-Session-A2.3		WeSeB-Session-B1.6
Zhang, Jianhua	ThSeB-Session-B2.1	Zhu, Haitao	WeSeB-Session-B3.5
	TuSeB-Session-B1.5	Zhu, Haonan	WeSeA-Session-A4.3
Zhang, Jinghao	TuSeB-Session-B2.5	Zhu, Huaishi	ThSeA-Session-A4.4
Zhang, Jingjie	TuSeA-Session-A3.4	Zhu, Jiayun	WeSeB-Session-B4.1
Zhang, Lijing	TuSeA-Session-A4	Zhu, Wenxuan	ThSeA-Session-A1.2
Zhang, Linsen	TuSeA-Session-A4.5	Zhu, Xiaoping	ThSeA-Session-A3
	WeSeA-Session-A4.4		ThSeA-Session-A3.4

Author Index

Z	
Zhu, Xiaoyuan	WeSeB-Session-B4.3
Zhu, Xu	ThSeB-Session-B2.2
	ThSeB-Session-B2.3
	ThSeA-Session-A3.4
Zhu, Yaqiong	ThSeA-Session-A3.4
Zhu, Yongkai	WeSeA-Session-A3.2
Zhu, Zhenhao	TuSeA-Session-A1.3
Zhuang, Jiafan	TuSeB-Session-B4.6
Zou, Bennjian	TuSeB-Session-B4.4
Zou, Qijie	TuSeB-Session-B2.5
	ThSeB-Session-B3.4
	TuSeA-Session-A2.1
Zou, Tao	TuSeB-Session-B3.2
Zou, Wulin	TuSeA-Session-A4
Zou, Yao	TuSeA-Session-A4
	TuSeA-Session-A4.1
	ThSeA-Session-A2.3
	ThSeA-Session-A2.5
Zulfiqar, Osama	ThSeA-Session-A4.1
Š	
Ševčík, Peter	TuSeB-Session-B3.6

Keyword Index

A		D	
Adaptive Aiding	TuSeA-Session-A2.2, TuSeA-Session-A2.3, TuSeA-Session-A3.4, TuSeA-Session-A3.6, TuSeB-Session-B3.3	Decision Support Systems	ThSeA-Session-A4.1, ThSeA-Session-A4.2, ThSeA-Session-A4.5, ThSeB-Session-B1.4, ThSeB-Session-B3.5, ThSeB-Session-B3.6, TuSeA-Session-A2.4, WeSeB-Session-B1.6, WeSeB-Session-B4.1
Adaptive Assistance;Design, Analysis, and Evaluation;Model-Based Design	TuSeA-Session-A2.1	Design, Analysis, and Evaluation	ThSeA-Session-A2.2, ThSeA-Session-A4.6, ThSeB-Session-B1.1, ThSeB-Session-B1.3, ThSeB-Session-B3.3, ThSeB-Session-B3.4, ThSeB-Session-B3.5, TuSeA-Session-A2.2, TuSeA-Session-A3.1, TuSeA-Session-A3.2, TuSeB-Session-B1.2, TuSeB-Session-B2.2, WeSeA-Session-A1.2, WeSeA-Session-A2.2, WeSeA-Session-A2.3, WeSeB-Session-B2.2, WeSeB-Session-B2.3, WeSeB-Session-B2.4, WeSeB-Session-B2.6, WeSeB-Session-B3.1, WeSeB-Session-B3.2, WeSeB-Session-B3.3, WeSeB-Session-B4.2
Assistive Technology and Rehabilitation Engineering	ThSeA-Session-A2.3, ThSeA-Session-A2.4, ThSeA-Session-A2.5, ThSeA-Session-A3.1, ThSeA-Session-A3.2, ThSeA-Session-A3.6, ThSeB-Session-B2.2, ThSeB-Session-B3.1, ThSeB-Session-B3.6, TuSeA-Session-A1.3, TuSeA-Session-A1.4, TuSeA-Session-A3.1, TuSeA-Session-A3.2, TuSeA-Session-A3.4, TuSeA-Session-A3.6, TuSeB-Session-B1.6, TuSeB-Session-B2.1, TuSeB-Session-B2.2, TuSeB-Session-B2.3, TuSeB-Session-B2.4, TuSeB-Session-B2.5, TuSeB-Session-B2.6, TuSeB-Session-B3.2, WeSeA-Session-A1.2, WeSeA-Session-A1.4, WeSeA-Session-A3.1		
Assistive Technology and Rehabilitation Engineering;Human-Machine Teaming;Design, Analysis, and Evaluation	WeSeA-Session-A3.6		
Autonomous Systems	ThSeA-Session-A3.5, TuSeA-Session-A1.1, TuSeA-Session-A1.2, TuSeA-Session-A2.4, TuSeA-Session-A3.3, TuSeA-Session-A4.1, TuSeB-Session-B3.5, WeSeA-Session-A1.3, WeSeA-Session-A1.4, WeSeA-Session-A2.2, WeSeA-Session-A4.3, WeSeA-Session-A4.5, WeSeB-Session-B1.1, WeSeB-Session-B1.2, WeSeB-Session-B1.4, WeSeB-Session-B1.5, WeSeB-Session-B1.6, WeSeB-Session-B2.3, WeSeB-Session-B3.1, WeSeB-Session-B3.2, WeSeB-Session-B3.3, WeSeB-Session-B3.4, WeSeB-Session-B3.5, WeSeB-Session-B4.1, WeSeB-Session-B4.2, WeSeB-Session-B4.3		
Autonomous Systems;Adaptive Assistance;Human Machine Systems	WeSeB-Session-B3.6		
C		H	
Cognitive System Engineering	ThSeB-Session-B2.1, ThSeB-Session-B3.1, TuSeB-Session-B2.3, TuSeB-Session-B3.6, WeSeA-Session-A4.5	Human Machine Systems	ThSeA-Session-A1.4, ThSeA-Session-A2.1, ThSeA-Session-A3.6, ThSeB-Session-B2.1, ThSeB-Session-B2.3, ThSeB-Session-B2.4, TuSeA-Session-A1.2, TuSeA-Session-A1.5, TuSeA-Session-A2.3, TuSeA-Session-A3.2, TuSeA-Session-A4.2, TuSeB-Session-B1.3, TuSeB-Session-B1.4, TuSeB-Session-B3.1, TuSeB-Session-B3.2, TuSeB-Session-B3.3, TuSeB-Session-B3.4, WeSeA-Session-A1.3, WeSeA-Session-A1.4, WeSeA-Session-A2.1, WeSeA-Session-A4.6, WeSeB-Session-B1.3, WeSeB-Session-B2.3, WeSeB-Session-B2.5, WeSeB-Session-B3.4
Cognitive Systems Engineering;Human Performance;Social Computing	ThSeB-Session-B3.2	Human Performance	ThSeA-Session-A1.2, ThSeA-Session-A4.5, ThSeB-Session-B1.3, ThSeB-Session-B3.1, TuSeB-Session-B2.2, TuSeB-Session-B2.4, WeSeA-Session-A1.1
		Human Performance;Assistive Technology and Rehabilitation Engineering;Model-Based Design	TuSeA-Session-A1.6
		Human-Computer Interaction	ThSeA-Session-A1.1, ThSeA-Session-A1.3, ThSeA-Session-A1.4, ThSeA-Session-A2.1, ThSeA-Session-A2.2, ThSeA-Session-A2.4, ThSeA-Session-A3.1, ThSeA-Session-A3.2, ThSeA-Session-A3.3, ThSeA-Session-A3.4, ThSeB-Session-B1.1, ThSeB-Session-B1.2, ThSeB-Session-B1.3, ThSeB-Session-B2.1, ThSeB-Session-B2.2, ThSeB-Session-B2.3, ThSeB-Session-B2.5, TuSeA-Session-A1.4, TuSeA-Session-A3.6, TuSeA-Session-A4.5, TuSeB-Session-B1.5, TuSeB-Session-B2.3, TuSeB-Session-B2.6, TuSeB-Session-B3.3, TuSeB-Session-B3.4, TuSeB-Session-B4.4, TuSeB-Session-B4.5, WeSeA-Session-A1.1, WeSeA-Session-A1.3, WeSeA-Session-A3.2, WeSeA-Session-A4.6, WeSeB-Session-B2.1

Keyword Index

H	
Human-Computer Interaction;Decision Support Systems;Human Machine Systems	WeSeA-Session-A2.4
Human-Computer Interaction;Human-Machine Interface;Design, Analysis, and Evaluation	ThSeA-Session-A1.5
Human-Machine Interfaces	ThSeA-Session-A1.1, ThSeA-Session-A1.2, ThSeA-Session-A1.4, ThSeA-Session-A2.3, ThSeA-Session-A2.5, ThSeA-Session-A2.6, ThSeB-Session-B2.4, ThSeB-Session-B2.5, TuSeA-Session-A1.5, TuSeA-Session-A4.5, TuSeB-Session-B1.3, TuSeB-Session-B1.4, TuSeB-Session-B1.6, TuSeB-Session-B3.4, WeSeA-Session-A1.1, WeSeA-Session-A4.6, WeSeB-Session-B1.3, WeSeB-Session-B2.6
Human-Machine Teaming	TuSeA-Session-A1.2, TuSeB-Session-B1.5, TuSeB-Session-B3.5, WeSeA-Session-A1.2, WeSeB-Session-B1.3
M	
Machine Learning	ThSeA-Session-A1.1, ThSeA-Session-A1.2, ThSeA-Session-A2.1, ThSeA-Session-A2.2, ThSeA-Session-A2.3, ThSeA-Session-A2.4, ThSeA-Session-A2.5, ThSeA-Session-A3.6, ThSeB-Session-B1.4, ThSeB-Session-B2.2, ThSeB-Session-B3.5, ThSeB-Session-B3.6, TuSeA-Session-A1.5, TuSeA-Session-A3.5, TuSeA-Session-A4.1, TuSeA-Session-A4.2, TuSeA-Session-A4.3, TuSeA-Session-A4.4, TuSeA-Session-A4.5, TuSeB-Session-B1.1, TuSeB-Session-B1.4, TuSeB-Session-B1.5, TuSeB-Session-B1.6, TuSeB-Session-B2.4, TuSeB-Session-B2.6, TuSeB-Session-B3.6, TuSeB-Session-B4.1, TuSeB-Session-B4.2, TuSeB-Session-B4.3, TuSeB-Session-B4.4, TuSeB-Session-B4.5, TuSeB-Session-B4.6, WeSeA-Session-A2.3, WeSeA-Session-A4.1, WeSeA-Session-A4.2, WeSeA-Session-A4.3, WeSeA-Session-A4.5, WeSeB-Session-B1.5, WeSeB-Session-B2.2, WeSeB-Session-B2.4, WeSeB-Session-B3.1, WeSeB-Session-B3.2, WeSeB-Session-B3.3, WeSeB-Session-B3.4, WeSeB-Session-B3.5, WeSeB-Session-B4.4
Machine Learning;Design, Analysis, and Evaluation;Autonomous Systems	ThSeA-Session-A4.4
Model-Based Design	ThSeA-Session-A4.1, ThSeB-Session-B1.1, ThSeB-Session-B1.4, ThSeB-Session-B2.3, ThSeB-Session-B3.4, TuSeA-Session-A1.1, TuSeA-Session-A2.2, TuSeA-Session-A4.1, TuSeB-Session-B1.2, TuSeB-Session-B1.3, TuSeB-Session-B4.4, TuSeB-Session-B4.5, TuSeB-Session-B4.6, WeSeA-Session-A2.2, WeSeA-Session-A2.3, WeSeA-Session-A4.3, WeSeB-Session-B1.4, WeSeB-Session-B1.5, WeSeB-Session-B2.1, WeSeB-Session-B2.4, WeSeB-Session-B2.5, WeSeB-Session-B4.1, WeSeB-Session-B4.3
Model-Based Design;Design, Analysis, and Evaluation	WeSeB-Session-B4.5
S	
Social Computing	ThSeA-Session-A4.1, ThSeA-Session-A4.2
Supervisory Control	TuSeA-Session-A4.3, WeSeB-Session-B1.6, WeSeB-Session-B4.2, WeSeB-Session-B4.3, WeSeB-Session-B4.4
U	
Usability Engineering	ThSeA-Session-A4.2, TuSeB-Session-B1.1, TuSeB-Session-B2.5, TuSeB-Session-B4.6, WeSeB-Session-B2.5, WeSeB-Session-B2.6, WeSeB-Session-B3.5
Usability Engineering;Assistive Technology and Rehabilitation Engineering;Design, Analysis, and Evaluation	WeSeA-Session-A4
V	
Virtual and Augmented Reality	ThSeA-Session-A3.1, ThSeA-Session-A3.2, TuSeA-Session-A1.4

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国家健康养老智能系统与装备质量检验检测中心隶属于中国电子工程设计院有限公司。于2019年9月获得国家认证认可监督管理委员会的资质授权，是国内“首个”健康养老领域的国家级质检中心，是我国健康养老领域唯一国家级质检中心。

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成立于2015年，凭借中国首家实现光学动捕全栈自研（算法-硬件-软件）的实力，奠定其高精尖技术领先企业的地位。青瞳视觉以计算机视觉与人工智能技术为核心，构建了完整的高精度3D智能感知与人机交互技术体系，核心技术自主化率高达100%，业务覆盖具身智能、工程科研、虚拟现实、生命科学、数字娱乐、青瞳教育六大领域，已为华为、腾讯、清华大学等1000+头部校企与机构提供全流程解决方案。

总部位于中国上海，并在全中国设有分支机构，产品远销产品远销亚洲、欧洲和美洲等地，致力于达成卓越的技术水平和服务品质，面向不同行业客户需求，提供全栈式全体系解决方案，捕捉每一帧精彩。



北京度量科技有限公司专注于自主研发、生产制造和销售光学三维动作捕捉系统。深耕自动化领域动作捕捉解决方案10年,产品行销20+国家，行业领域用户 1200+。

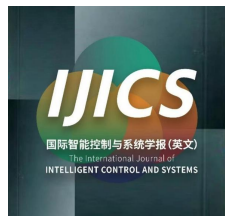
核心产品 -NOKOV 度量光学三维动作捕捉系统，是一种实时高精度三维空间定位设备。可实时获取捕捉对象的 3D 位置信息和 6DOF 数据。系统广泛应用于人机交互、人形机器人开发训练、具身智能、多智能体协同控制、外骨骼机器人、仿生机器人、航空航天、军事军工等研究。其解决方案深受斯坦福、牛津、宾大、慕尼黑工大、印度理工、东京大学等全球顶尖学府的信赖，已支持发表655余篇学术论文。

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IEEE/CAA Journal of Automatica Sinica 自动化学报（英文）是由中国科协主管，中国自动化学会主办，入选中国科技期刊卓越行动计划二期英文领军期刊的开放获取英文学术期刊，由澳大利亚斯威本科技大学副校长韩青龙教授担任主编。

本刊旨在刊载自动化科学与技术领域理论性和应用性研究成果，反映自动化科学与技术科研进展与学术动态，促进自动控制与信息科学研究领域的国际交流，服务中国自动化事业发展。本刊被SCIE, EI, Scopus, Inspec, DBLP, CNKI, CSCD, IEEE Xplore等国际重要数据库检索收录，数据同步存储于中科院自动化所机构知识库（本地化）及 ScienceDB 自主科学数据开放共享平台，实现论文关联数据开放共享。本刊是中科院期刊分区工程技术和计算机科学类一区Top期刊，中国自动化学会推荐科技期刊目录A+类期刊；2024年SCI影响因子19.2，在自动化与控制领域排名全球第1，是该领域唯一的中国主办Q1区SCI期刊；2024年CiteScore为28.2，在控制与优化领域排名全球第1，谷歌学术计量自动化与控制理论学科顶级出版物中排名全球第7，是该学科TOP20出版物中世界最年轻且唯一中国主办的期刊。



The International Journal of Intelligent Control and Systems 《国际智能控制与系统学报（英文）》是由中国科学技术协会主管、中国自动化学会主办的国际学术期刊。期刊创立于1996年，由王飞跃教授担任主编。本刊聚焦国内外智能控制与系统研究现状与趋势，重点报道智能控制与系统领域的高水平研究成果和最新进展，充分反映智能控制理论、智能技术事业发展的全貌和特色，致力于促进智能控制与系统领域的学术交流。

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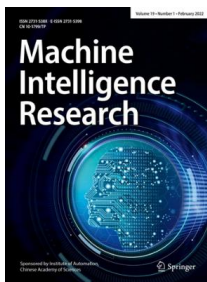


Intelligence & Robotics (IR, Online ISSN 2770-3541) 是OAE Publishing Inc.于2021年6月创办的一本金色开放获取、严格同行评议的国际学术期刊, ESCI (IF=2.3, Q2)、Scopus (CiteScoreTracker=4.4)、Dimensions、Lens收录。由加拿大工程院院士、圭尔夫大学终身教授Simon. X. Yang担任主编, 美国Takeo Kanade 院士、中国柴天佑院士、李德毅院士和焦李成院士、日本Toshio Fukuda 院士、加拿大Clarence W. de Silva院士担任顾问编委。

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截至目前, IR发布高质量文章140余篇, 我们诚挚欢迎该领域的专家学者关注期刊并踊跃投稿, 我们将为您提供科学、规范、高效的文章发表服务!



Machine Intelligence Research (简称MIR) 由中国科学院自动化研究所主办, 于2022年正式出版, 主编为谭铁牛院士。MIR立足国内、面向全球, 着眼于服务国家战略需求, 刊发机器智能领域最新原创研究性论文、综述、评论等。期刊两度入选“中国科技期刊卓越行动计划”, 已被ESCI、EI、Scopus、中国科技核心期刊、CSCD等20余家国际数据库收录。最新CiteScore达13.2分, 在所属领域最佳排名挺进全球前2%, 在全部所属领域均成功跻身Q1区。2024年获得首个影响因子(IF) 6.4, 位列人工智能及自动化&控制系统两个领域JCR Q1区; 2025年发布的最新影响因子达8.7, 继续跻身JCR Q1区, 最佳排名进入全球第6名; 2025年一举进入中科院期刊分区表计算机科学二区。

Organization Information

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