

IEEE-IARCE

2025年IEEE第五届 工业自动化、机器人与控制工程国际会议

2025 IEEE 5th International Conference on Industrial Automation, Robotics and Control Engineering (IEEE-IARCE 2025)

Conference Program



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Welcome Message

Dear Distinguished Participants,

On behalf of the Organizing Committee, it is our great pleasure to extend a warm welcome to all participants of the 2025 IEEE 5th International Conference on Industrial Automation, Robotics, and Control Engineering (IEEE-IARCE 2025), which will be held in the vibrant city of Chongqing, China, from November 21 to 23, 2025.

Organized by Chongqing University of Posts and Telecommunications (CQUPT), this conference is hosted by Chongqing Electric Power College, the School of Automation, and the School of Communication and Information Engineering at CQUPT, alongside the Intelligent Distributed Energy Professional Committee of the Chinese Association of Automation. It is co-organized in cooperation with Southwest Hospital, Beihang University, Southwest Jiaotong University, and the Chinese Society for Stereology.

It provides a valuable platform for leading academic scientists, researchers, and industry professionals from around the world to share novel discoveries, knowledge, and experiences in the fields of Industrial Automation, Robotics, and Control Engineering, while facilitating the presentation of cutting-edge research, exchange of innovative ideas, and exploration of collaborative opportunities.

To foster in-depth dialogue and knowledge sharing, we have curated a comprehensive technical program that includes keynote speeches, parallel sessions, and panel discussions. Your participation and contributions are vital to the success of this conference, and we are confident that together we will advance the frontiers of both academic research and industrial applications.

We look forward to a fruitful and inspiring conference, and wish you a rewarding and memorable experience in Chongqing.

Sincerely, IEEE-IARCE 2025 Conference Committee

Organizing Committee

Honorary Chairs

- KWONG Sam Tak Wu Lingnan University, Hong Kong, China; IEEE Fellow, Fellow of US National Academy of Inventors (NAI)
- Tingwen Huang Shenzhen University of Advanced Technology, China; Fellow of IEEE, AAIA, IAPR. TWAS
- Xiangyang Ji Tsinghua University, China

General Chairs

- · Xinbo Gao Xidian University, China
- Yang Li Beihang University, China

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- Dedong Tang Chongqing Electric Power College, China
- Feifei Gao Tsinghua University, China; IEEE Fellow
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- Nan Wu Beijing Institute of Technology, China

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- Xiaobo Zhang Southwest Jiaotong University, China
- Ming Lu Hunan University of Science and Technology, China
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Publication Chair

 Mengqi Zhou — Executive Vice Chairman of IEEE China Council Vice Chairman of IEEE Beijing Section; Chairman of IEEE China Conference Committee, China

Organizing Committee

Publication Co-Chairs

- Rui Araújo University of Coimbra, Portugal
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- Chengchao Liang Chongqing University of Posts and Telecommunications, China
- Cheng Chen PKU-Changsha Institute for Computing and Digital Economy, China
- Samir Ladaci Ecole Nationale Polytechnique, Algeria

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- Liang Zhang Xidian University, China
- Zhongyuan Guo Chongqing University of Science and Technology, China

Finance Chair

Dajiang Lei — Chongqing University of Posts and Telecommunications, China

Local Chairs

- Hongyu Long Chongqing University of Posts and Telecommunications, China
- Ke Liu Chongqing University of Posts and Telecommunications, China

Program Committee

- Huseyin Canbolat Ankara Yildirim Beyazit University, Turkey
- Mohammed Abu Mallouh Hashemite University, Jordan
- Xiangyun Li West China Hospital, Sichuan University, China
- Changzhong Pan Hunan University of Science and Technology, China

General Information

☆ Onsite Registration

The registration desk will be situated at Huayi hotel lobby (1F) during the following time: 10:00-19:00, Friday, November 21, 2025.

☆ Dining and Coffee Breaks

The conference will provide coffee breaks, lunch, and dinner during the conference day. Any additional items beyond the fixed menu will be charged to individuals.

☆ Presentation

- · Keynote Speech: 45 mins, including Q&A.
- · Oral Session: 10 mins, including Q&A.
- Poster Presentation: Poster size (A1: 841mm*594mm)

☆ Devices Provided

All presentation rooms are equipped with a screen, an LCD projector, and a laptop computer installed with Microsoft PowerPoint.

* We recommend you bring two copies of the file in case that one fails.

The Dress Code

Business casual, formal, or national custom is recommended.

☆ Certificates

All presenters will receive a certificate of participation during the scheduled session, certifying that their paper was presented at the conference.

Awards

Certificates for the Best Paper Award and the Excellent Oral Presentation Award will be presented at the conference.

☆ Time Difference

GMT+8, China Standard Time (CST).

Please be aware of the time difference between this location and your region or country.

☆ Notice

- * Please wear your delegate badge (name tag) during all conference activities.
- * Please take good care of your valuables at all times during the conference. The conference organizer does not assume any responsibility for the loss of participants' personal belongings during the conference days.

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Venue Information

Venue Location

Venue Location: Chongqing Electric Power College (Tongnan Campus)

会议地点: 重庆电力高等专科学校潼南校区

Address: No.1000 Jinxiu Avenue, Tongnan District, Chongqing, China

地址: 重庆市潼南区桂林街道锦绣大道1000号

Hotel Recommendation

Chongqing Huayi Hotel

酒店名称: 重庆华逸酒店(漳南高铁站店)

Address: No. 209 Shiji Avenue, Tongnan District, Chongqing, China

地址: 重庆市潼南区世纪大道209号

Book hotels via Ctrip, Meituan, or Trip.com. Alternatively, contact our hotel manager directly at

+86 19112859770 (Manager Liu)

预定方式: 预定住宿可通过携程、美团、同程旅行等官方平台预定。也可以直接联系酒店客房负

责人刘经理: 19112859770。

Floor Plan

Registration Desk | 签到处

Lobby of the Chongqing Huayi Hotel, 1st floor 重庆华逸酒店,一楼大堂

Meeting Room | 会场安排

Main Hall | 主会场:

Lecture Hall 112 图书馆112学术报告厅

Parallel Sessions | 分会场:

Building 1, Ningxu Building: Room 31102, Room 31104, Room 31105

凝煦楼1栋: 31102室、31104室、31105室

Restaurant | 用餐地点

Lunch: Chongqing Electric Power College (Tongnan Campus), The Second Dining Hall, 3rd floor

午餐: 重庆电力高等专科学校潼南校区,第二食堂,三楼

Dinner: Chongqing Huayi Hotel

晚餐: 华逸酒店

Conference Agenda

	November 21st, 2025 (Friday)		
10:00-19:00	Onsite Registration & Sign-in & Conference Kits Collection		Lobby of the Chongqing Huayi Hotel, 1st floor
	November 22nd, 2025	5 (Saturday)	
Time	Content	Host	Location
9:00-9:20	Opening Address		
9:20-9:25	Group Photo	Assoc. Prof. Yue Zhao	Lecture Hall
9:25-10:10 Keynote Speaker I	Prof. KWONG Sam Tak Wu Lingnan University, Hong Kong, China; IEEE Fellow, Fellow of US National Academy of Inventors (NAI)	Chongqing University of Posts and Telecommunications, China	112, Library
10:10-10:30 Coffee Break			
10:30-11:15 Keynote Speaker II	Prof. Xiangyang Ji Tsinghua University, China	Dr. Zhongyuan Guo Chongqing University of Science and Technology, China	Lecture Hall
11:15-12:00 Keynote Speaker III	Prof. Huayan Pu Chongqing University, China	Prof. Hongyu Long Chongqing University of Posts and Telecommunications, China	112, Library
12:00-14:00		Lunch	
14:00-14:45 Keynote Speaker IV	Prof. Weisheng Li Chongqing University of Posts and Telecommunications, China	Assoc. Prof. Xiaobo Zhang Southwest Jiaotong University, China	Lecture Hall 112, Library

Conference Agenda

November 22nd, 2025 (Saturday)			
Time	Content	Session Chairs	Location
15:00-18:00 Parallel Session I	Special Session I Al-Native Communication and Intelligent Information Processing Special Session II Industrial Internet & Wireless Sensing and Transmission Special Session VIII Neural Decoding in Brain- Computer Interfaces for Diagnosis and Therapy of Brain Disorders	Assoc. Prof. Peng Chen Southwest Jiaotong University, China Assoc. Prof. Ke Liu Chongqing University of Posts and Telecommunications, China	Room 31102, Building 1, Ningxu Building
15:00-18:00 Parallel Session II	Special Session IV Biomedical Information Perception, Computation and Control Special Session V Embodied Intelligent Robotic Joint Technologies: Innovative Design and Applications Special Session VI Medical Assistive Robots	Prof. Ming Lu Hunan University of Science and Technology, China Researcher Cheng Chen PKU-Changsha Institute for Computing and Digital Economy, China	Room 31104, Building 1, Ningxu Building
15:00-18:00 Parallel Session III	Special Session III Low Carbon Electrical Engineering & Automation Control Special Session VII Intelligent Processing and optimization of Medical Information	Prof. Hongyu Long Chongqing University of Posts and Telecommunications, China Assoc. Prof. Yue Zhao Chongqing University of Posts and Telecommunications, China	Room 31105, Building 1, Ningxu Building

Conference Agenda

November 22nd, 2025 (Saturday)	
Time	Content
16:00-16:30	Coffee Break
18:00-18:30	Award & Closing Ceremony
18:30-20:00	Dinner Time

IARCE 2025 Morning Session (Online)

Meeting Time: November 22, 2025, 08:45 - 12:15 (GMT+08:00)

Please click the link to join the meeting or add it to your calendar: https://meeting.tencent.com/dm/16cXT46zMSo7

Meeting ID: 610-978-885

IARCE 2025 Afternoon Session (Online)

Meeting Time: November 22, 2025, 13:50 - 15:10 (GMT+08:00)

Please click the link to join the meeting or add it to your calendar: https://meeting.tencent.com/dm/PQsjZsI9fRVY

Meeting ID: 285-367-943



Prof. KWONG Sam Tak Wu Lingnan University, Hong Kong, China IEEE Fellow, Fellow of US National Academy of Inventors (NAI)

Speech Title:

Empowering Multi-Robot Flocking in Complex Environments via Effective Communication: A Deep Reinforcement Learning Approach

Abstract:

Multi-robot flocking is crucial for safe and cooperative navigation, with wide applications in logistics, service delivery, and mobile surveillance. Despite significant progress, developing effective flocking strategies under complex conditions remains challenging. Communication is a vital technique for multi-robot coordination. In this paper, we propose REIN, a novel deep reinforcement learning-based framework designed to improve communication effectiveness in leader-follower flocking systems through the Refinement and Enhancement of communication INformation. Firstly, regarding information refinement, a graph-based information refiner, integrating directed graph-structured communication with an innovative edge filter, is developed for selective multi-robot interaction. It helps robots adaptively focus on relevant neighbors, considerably alleviating information overload. Secondly, for information enhancement, a cognition-aligned information enhancer is designed that boosts information expressiveness by encouraging team consensus. It utilizes two cascaded leader-related objectives to optimize information towards cognitive alignment among decentralized followers. Extensive comparisons with state-of-the-art approaches and ablation versions demonstrate the superiority of our framework. Physical experiments are also conducted to validate its practicality.

Brief Introduction:

Professor KWONG Sam Tak Wu is the Associate Vice-President (Strategic Research), J.K. Lee Chair Professor of Computational Intelligence, the Dean of the School of Graduate Studies and the Acting Dean of the School of Data Science of Lingnan University. Professor Kwong is a distinguished scholar in evolutionary computation, artificial intelligence (AI) solutions, and image/video processing, with a strong record of scientific innovations and real-world impacts. Professor Kwong is one of the most highly cited researchers by Clarivate in 2022, 2023 and 2024. He has also been actively engaged in knowledge transfer between academia and industry. He was elevated to IEEE Fellow in 2014 for his contributions to optimization techniques in cybernetics and video coding. He was the President of the IEEE Systems, Man, and Cybernetics Society (SMCS) in 2021-22. He is a fellow of US National Academy of Inventors (NAI), Canadian Academy of Engineering and the Hong Kong Academy of Engineering (HKAE). Professor Kwong has a prolific publication record with over 350 journal articles, and 160 conference papers with an h-index of 93 based on Google Scholar. He is currently the associate editor of a number of leading IEEE transaction journals.



Prof. Xiangyang JiTsinghua University, China

Speech Title:Vision-based Object Pose Estimation

Abstract:

The 6DoF pose estimation of an object is the key basis for many complex vision tasks in the real world, and has a wide range of applications in the fields of autonomous driving, virtual/augmented reality, and scene interaction. The report first reviews the development status of 6D pose estimation in recent years and the challenges it faces, and then introduces our deep convolutional neural network-based pose iterative matching framework DeepIM, and discusses how to design the decoupling representation of rotation and translation in pose estimation. We further introduce a detection-based framework to integrate the direct translation estimation and the indirect rotation estimation into a unified model, called CDPN. Afterwards, we present more recent progresses based on these two frameworks with self-supervision, reinforcement learning etc.

Brief Introduction:

Professor of the Department of Automation of Tsinghua University, the main research directions include machine learning, visual signal acquisition and processing. He is the director of the Department of Brain Science and Cognitive Science of the Automation Department. The National Science Fund for Distinguished Young Scholars, China Youth Science and Technology Award and other academic honors are awarded. He serves as the chairman of the Youth Working Committee of the Chinese Institute of Electronics, and the director of the Deep Learning Special Committee of the Chinese Association for Artificial Intelligence. He has published more than 100 SCI/EI papers in TCI, TPAMI, IJCV, NIPS, ICML, CVPR, ICCV and was authorized more than 40 national invention patents, 10 international invention patents, and won the 70th Nuremberg International Invention Gold Award twice. In addition, he and his team won the championship MSCOCO visual instance segmentation, ECCV visual quality enhancement, ICCV/ECCV 6D pose estimation and other international competitions etc. He was awarded the second prize of the National Scientific and Technological Progress Award in 2019 (Rank 1st) and the second prize of the National Technical Invention Award in 2023 (Rank 1 st).



Prof. Huayan PuChongqing University, China

Speech Title:

Programmable Passive Continuous Mechanical Computation with Multistable Mechanisms

Abstract:

With advancements in materials science and manufacturing processes, physical intelligence and mechanical intelligence have garnered increasing attention. This report elaborates on the concepts, classifications, and cutting-edge developments of mechanical intelligence.

Brief Introduction:

Pu Huayan, recipient of the National Science Foundation for Distinguished Young Scholars and the China Youth Science and Technology Award. She is a Professor and a Doctoral Supervisor at Chongqing University, serving as the Director of the Institute of Robotics, Chongqing University. She is one of the overall expert group of the National Key Special Project on Marine Environment and Sustainable Development of Islands and Reefs. Her research interest mainly focus on transmission system dynamics, vibration and noise reduction, as well as individual and swarm intelligence of intelligent unmanned systems.



Prof. Weisheng LiChongqing University of Posts and Telecommunications,
China

Speech Title:

Multimodal medical image processing and its application

Abstract:

Multimodal medical image processing can provide doctors with rich visual guidance, thereby reducing surgical operation difficulty and enhancing precision. Focusing primarily on multimodal imaging such as clinical CT, MRI, and X-ray, it visually represents the multidimensional dynamic registration and fusion information of medical images, improving the reliability and stability of medical imaging systems.

Brief Introduction:

Li Weisheng, Chongqing University of Posts and Telecommunications, Ph.D., Professor, Doctoral Supervisor; Vice President of Chongqing University of Posts and Telecommunications. Specializing in big data intelligent computing, pattern recognition, and digital image processing.

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Parallel Session I



Date

Nov. 22nd, 2025



Location & Time

Room 31102, Building 1, Ningxu Building, 15:00 -18:00



Session Chairs

Assoc. Prof. Peng Chen

Southwest Jiaotong University, China

Assoc. Prof. Ke Liu

Chongqing University of Posts and Telecommunications, China

Special Sessions

Special Session I: Al-Native Communication and Intelligent Information Processing

Special Session II: Industrial Internet & Wireless Sensing and Transmission

Special Session VIII: Neural Decoding in Brain-Computer Interfaces for Diagnosis and Therapy of Brain Disorders

Invited Speaker I



Prof. Filippo SanfilippoUniversity of Agder, Norway

Invited Speaker II



Prof. Samir LadaciEcole Nationale Polytechnique, Algeria

Invited Speaker III



Prof. Priti Srinivas Sajja Sardar Patel University, India

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ER057	Paper Title: Implementation of a Reconfigurable Manufacturing System based on a Case Study of a Small-Scale Chocolate Manufacturing Enterprise Presenter: Primož Podržaj
ER078	Paper Title: Adaptive Filter with Convex Combination Based on Generalized Minimum Error Entropy Presenter: Zhongrui Jing
ER014	Paper Title: A Dual-Channel Coupler for UAVs Wireless Charging and Full-Duplex Communication Presenter: Liukang Tang
ER025	Paper Title: Multi-Agent Reinforcement Learning for Integrated Shared AV Fleets and Charging Grid Management Presenter: Zixin Guo
ER002	Paper Title: A Multi-class Anomaly Detection Method Based on Reverse Distillation and Mixed-Attention Presenter: Jiacheng Yun
ER016	Paper Title: HST-GCN: A Hierarchical Spatio-Temporal Graph Network for Icing Risk Prediction Presenter: Haisheng Ma
ER044	Paper Title: Task-Specific Source Extraction with Neuroanatomical Constraints for Motor Imagery Decoding Presenter: Zhen Wang
ER028	Paper Title: An Orthogonal DD-Coil with Rotating Magnetic Fields for UAVs Omnidirectional Wireless Power Transfer Presenter: Yuxuan Xu
ER029	Paper Title: Enhancing Wireless Charging Output Capability with Four-side L-shaped Coil Integration Presenter: Ruoyi Ran
ER050	Paper Title: A Testing Architecture and A Testing System for Power Internet of Things Presenter: Hanbing Xu
ER079	Paper Title: A Relative Spatial Representation for Motor Imagery fNIRS Decoding Presenter: Zhou Lv



Prof. Filippo SanfilippoUniversity of Agder, Norway

Speech Title: Human-Robot Teaming (HRT)

Abstract:

Human-robot interaction (HRI) is the study of how humans and robots interact, as well as how to develop robots that can adapt to human behavior. Human-robot cooperation (HRC) expands on this by creating new approaches and technologies that allow robots to collaborate with people in shared environments. The field of human-robot teaming (HRT) goes one step further, by studying how to create teams of humans and robots that can work together effectively and efficiently to achieve common goals. In this talk, an overview of the possible real-life applications for HRT will be presented.

Brief Introduction:

Filippo Sanfilippo holds a PhD in Engineering Cybernetics from the Norwegian University of Science and Technology (NTNU), Norway, with a focus on intelligent control approaches for robotic manipulators. His research focus on Human-Robot Teaming (HRT), which includes robotics, wearables, human-robot teaming, artificial intelligence, and control theory. He is currently appointed as a Professor at the Faculty of Engineering and Science, University of Agder (UiA), Grimstad, Norway. He carries a vast experience in participating in European research programs and various national projects from the Research Council of Norway (RCN). He is an IEEE Senior Member. He is the former Chair of the IEEE Norway Section. He is the Chair of the IEEE Robotics and Automation, Control Systems and Intelligent Transportation Systems Joint Chapter. He is the Chair of the Norway Section Life Members Affinity Group. He is currently a member of the IEEE Region 8 Chapter Coordination Committee, of the Conference Coordination Committee, of the IEEE Public Visibility Committee, of the IEEE R8 Awards and Recognitions Committee, and of the Professional and Educational Activities Committee. He is also the former Treasurer of the Norsk Forening for Kunstig Intelligens (NAIS), the Norwegian Association for Artificial Intelligence. He has authored and co-authored several technical papers in various journals and conferences. He is a reviewer for several international conferences and journals.



Prof. Samir LadaciEcole Nationale Polytechnique, Algeria

Speech Title: Fractional Order Control Of Robot Manipulators For Manufacturing Industry Advancement

Abstract:

Robotic manipulators are electronically controlled mechanisms consisting of multiple segments that perform tasks by interacting with their environment. They can perform repetitive tasks at speeds and accuracies far exceeding human operators. They can move or handle objects automatically depending upon the given number of DOF. Technological advancements have greatly improved robotic manipulators' accuracy and precision, thus allowing them to automate new applications such as automated 3D printing. Robotic manipulator automation makes manufacturing processes more efficient, reliable, and productive. As a result, considerable attention has been given to modelling the robotic manipulators and designing practical controllers that are easy to implement and provide optimal controlled performance. Fractional order operators have proved to be a very efficient tool for modeling and control design of industrial systems. Since the famous fractional order PID proposed by Podlubny and the CRONE control proposed by Oustaloup in the 1990s, a huge number of control technique using this mathematical tool have been developed so far. Among them, fractional adaptive control has demonstrated a very impressive performance and robustness improvement. In this talk we will present some recent application of fractional order adaptive control schemes, mainly based on MRAC to robot manipulators in indutrial environment. The proposed talk invites more interest and contribution to this field in order to gain in performance and efficeency and realize the top of Industy 4.0.

Brief Introduction:

Samir Ladaci obtained the State Engineer degree in Automatics in 1995 from the National Polytechnic School of Algiers and the Magister degree in Industrial Automation from Annaba University, Algeria in 1999. He obtained his Science Doctorate and Habilitation degrees from the department of Electronics, Mentouri University of Constantine, Algeria, in 2007 and 2009 respectively. His was a visiting researcher at IRCCyN (now LS2N), CNRS Nantes, France from 2006 to 2008, and has many collaboration projects with different research teams in France, Germany, Tunisia and Italy. From 2001 to 2013 he worked at the Department of Electrical Engineering at Skikda University, Algeria, as an Associate Professor. And from 2013 to October 2021 he was a full professor at the National Polytechnic School of Constantine, since that he joined the National Polytechnic School of Algiers. He has published more than 250 papers in journals and International conferences, many book chapters and co-edited a book and supervises many PhD theses (15 already defended with success). His current research interests include Fractional order Systems and Control, Adaptive Control, Robotics, Renewable Energy, Nonlinear and chaotic systems, Biomedical systems.



Prof. Priti Srinivas SajjaSardar Patel University, India

Speech Title:Hybrid Fuzzy Applications in Various Domains

Abstract:

This is the era of intelligence and the Artificial Intelligence and Machine Learning (AIML) based techniques are ubiquitously used in various domains. However, there is no single technique that would be effectively used for the problem solving and decision making. This leads to the hybridization of various techniques. In this brief talk, fuzzy systems are introduced and hybridized with various other techniques such as deep learning models, evolutionary systems, etc. stating their applications and advantages. Domains such as education, manufacturing & control, consumer modelling, healthcare, agriculture, banking & finance, cyber security, defence, etc. are explored and brief demonstration of how the hybrid fuzzy system works is discussed here. The talk concludes with advantages and possible research contributions in the domain.

Brief Introduction:

Dr. Priti Srinivas Sajja (b. 1970) is a Professor and Director of the PG Department of Computer Science & Technology at Sardar Patel University, India. She earned her M.S. in 1993 and Ph.D. in 2000, both in Computer Science from the same university. She specializes in Artificial Intelligence, Machine Learning, and Systems Analysis & Design, and has authored several international books with a total of 243 publications. She served as Principal Investigator on a major UGC-funded research project and on an Indo-Russian DST (Department of Science & Technology) project. She has mentored numerous PhD scholars, too. She has rendered her expertise as a resource person for AICTE and NAAC, contributing to quality and accreditation processes in India. She also held a key state-government role as Director of the Gujarat University Granth Nirman Board, a committee formed by the Governor on the recommendation of the Chief Minister of the state in India. She is a recipient of multiple awards — notably the Sardar Patel Research Award (five time) and a Lifetime Achievement Award from the National Foundation for Entrepreneurship Development.

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Parallel Session II



Date

Nov. 22nd. 2025



Location & Time

Room 31104, Building 1, Ningxu Building, 15:00-18:00



Session Chairs

Prof. Ming Lu

Hunan University of Science and Technology, China

Researcher Cheng Chen

PKU-Changsha Institute for Computing and Digital Economy, China

Special Sessions



Special Session IV: Biomedical Information Perception, Computation and Control

Special Session V: Embodied Intelligent Robotic Joint Technologies: Innovative Design and

Applications

Special Session VI: Medical Assistive Robots

ER072

Paper Title: Fast Adaptation for Railway Icing Prediction: A Spatio-Temporal Few-Shot

Learning Approach
Presenter: Lifang Zhang

ER024

Paper Title: Cognitive State and Emotion Recognition Based on Multi-modal Contrastive

Learning for Pre-training

Presenter: Weicong Li

ER070

Paper Title: Design and Application of a 6-DOF Robotic Arm

Presenter: Xiaodi Li

ER068

Paper Title: A Study on the Stability of a Wrapping Robot Based on the Overturning

Momen Momen

Presenter: Shuaifeng Du

ER073

Paper Title: iTransformer-Based Temperature Forecasting in High-Altitude Plateau

Environments DiLSTM-iTransformer-RMSPre-LN

Presenter: Zixuan Zhao

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ER048	Paper Title: Decoding Motor Imagery from Occipital EEG Based on Cross-Brain-Region Feature Distillation Presenter: Peidong Duan
ER074	Paper Title: A Cross-Modal Network Integrating the Spatial-Frequency Relationship of EEG for State Recognition Presenter: Shuangqi Wang
ER007	Paper Title: A Topological Classification for Alzheimer's Disease via Hemoglobin Concentration fNIRS Data Presenter: Siyuan Liu
ER065	Paper Title: ZeroYolo: A New YOLO-Based Deep Neural Network with Zero-shot learning for Multi-class Mining Tiny Object Detection Presenter: Yijia Yang
ER076	Paper Title: Design and Modeling of a Low-Cost Upper-Limb Rehabilitation Exoskeleton with Tunable Gravity Compensation and Safety-Constrained Workspace Presenter: Xinyu Han
ER010	Paper Title: Structural design and kinematics characteristics of children's lower limb rehabilitation robot Presenter: Zhonghua Xie

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Parallel Session III



Date

Nov. 22nd, 2025



Location & Time

Room 31105, Building 1, Ningxu Building, 15:00-18:00



Session Chairs

Prof. Hongyu Long

Chongqing University of Posts and Telecommunications, China Assoc. Prof. Yue Zhao

Chongqing University of Posts and Telecommunications, China



Special Sessions

Special Session III: Low Carbon Electrical Engineering & Automation Control Special Session VII: Intelligent Processing and optimization of Medical Information





Dr. Shiling Zhang

State Grid Chongqing Electric Power Company Electric Power Economy and Technology Research Institute





Yong Li

State Grid Chongqing Electric Power Company Electric Power Science Research Institute

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ER015	Paper Title: Differentiable Model Predictive Safety for Heterogeneous Mobility at Urban Unsignalized Intersections Presenter: Wenzhe Song
ER054	Paper Title: Robust Distributed Planning for AC/MTDC Hybrid Power System Flexible Operation via Enhanced Generalized Benders Decomposition Presenter: Jincheng Jiang
ER038	Paper Title: An accurate method for SOH estimation of lithium-ion batteries based on AGWO-SVR algorithm Presenter: Lilei Zhang
ER056	Paper Title: Design and manufacturing of a device for obtaining 3D filament from plastic bottles Presenter: Primož Podržaj
ER044	Paper Title: Task-Specific Source Extraction with Neuroanatomical Constraints for Motor Imagery Decoding Presenter: Zhen Wang
ER052	Paper Title: An Empirical Evaluation of a Model-Based Test Data Generation Framework for Reducing System Integration Delays Presenter: Datta Snehith Dupakuntla Naga
ER071	Paper Title: Serenon: An Al-Powered, Gamified Platform for Emotionally Adaptive Mental Wellness Presenter: Chandan Raj B R
ER018	Paper Title: A Convolutional Neural Network Combining Multi-Scale Convolution and Functional Connectivity for Predicting rTMS Efficacy in MUD Presenter: Yongcong Li
ER067	Paper Title: Physics-Based Co-Simulation of Building-to-Grid Interactions: A Federated Framework for Voltage Stability Assessment Presenter: Boyu Wang



Dr. Shiling ZhangState Grid Chongqing Electric Power Company Electric
Power Economy and Technology Research Institute

Speech Title:

Numerical Calculation and Structural Optimization of Multi-physical Field Coupling for Basin Insulator

Abstract:

To meet the proposed requirements of high voltage and high current transmission, the operation performance of basin insulators needs to be analyzed in depth in field of multi-physical field coupling simulation, and the topology of basin insulators should be optimized based on results of the multi-physical field coupling simulation. Firstly, electrical-thermal-mechanical performance parameters of basin insulator bulk materials are obtained through experiments. Based on experimental data, the multi-physical field for calculating electric-thermal-mechanical system is proposed. The non-linear relationship between dielectric constant, tangent value of loss angle, thermal conductivity and thermal expansion coefficient and temperature is taken into account in the calculation of a single physical field. A three-dimensional finite element model of a basin insulator is further established to decouple the electric field, temper-ature field and stress field. RBF neural network is used to learn the simulation data of electric-thermal-mechanical multi-physical coupling field, so as to realize the non-linear inversion of the optimal structural parameters of the basin and obtain the optimal structural parameters of the basin insulator. The application results show that the decoupling simulation of basin insulators can be effectively realized by the multi-physical field finite element method. The maximum electric field strength of the basin body is also near the central conductor.

Brief Introduction:

Developed ultra-high voltage dry-type converter transformer bushings and SF6 gas-insulated wall-penetrating bushings, which have been applied in China's ultra-high voltage AC and DC power grid projects. Led the development of GIS fault detection sensing technology and systems, winning the Outstanding Innovation Achievement Award at the International Innovation and Entrepreneurship Expo. Awarded the title of Outstanding Science and Technology Worker by the Chongqing Electrotechnical Engineering Society.

As the first author, he has published over 90 SCI/EI-indexed papers in domestic and international journals and top-tier academic conferences, including 18 articles in Peking University's Chinese Core Journals. His innovative achievements have earned nine provincial and ministerial-level awards, such as the First Prize for Scientific and Technological Progress in Chongqing and the Special First Prize from the China Water Resources and Electric Power Quality Management Association. Additionally, he has filed one international patent application, secured 20 national invention and utility model patents, and obtained 18 software copyrights. He has delivered over 20 conference presentations internationally and domestically. As the principal investigator, he has led two provincial/ministerial-level foundational research projects and three scientific research projects for the State Grid Corporation of China headquarters.



Yong Li
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Speech Title:

A Novel Detection Technology for Mechanical Characteristics of High-Voltage Circuit Breakers Based on Electromagnetic Coupling and Machine Vision

Abstract:

To address the challenges associated with traditional methods for testing the mechanical characteristics of circuit breakers—such as the need to install specialized fixtures, complex operations, potential damage to the circuit breaker, and the risk of induced electricity when removing grounding wires—State Grid Chongqing Electric Power Research Institute has developed a novel detection technology for mechanical characteristics of high-voltage circuit breakers based on electromagnetic coupling and machine vision. This device uses a miniature camera to capture video of the circuit breaker's operating mechanism movement, enabling non-contact measurement of its speed characteristics. Additionally, it measures opening and closing time characteristics without removing the grounding wire by injecting high-frequency induced current, thereby improving test safety. The technology has been applied in regions such as Chongqing, Anhui, Hunan, and Shandong, where it has demonstrated a fourfold increase in maintenance efficiency compared to traditional testing devices.

Brief Introduction:

Li Yong holds a master's degree from Chongqing University and is a Senior Engineer. He currently serves as Deputy Director of the Equipment Condition Assessment Center at the Electric Power Research Institute of State Grid Chongqing Electric Power Company, Secretary-General of the Substation Operation and Maintenance Subcommittee under the IEEE PES Substations Committee (China), a member of the Power Micro-Intelligent Sensing Standardization Technical Committee of the China Electricity Council, and a member of the Gas-Insulated Metal-Enclosed Switchgear (GIS) Standardization Technical Committee of the China Electricity Council.

Mr. Li has long been engaged in technical research and key technological breakthroughs in the field of condition monitoring and assessment of transmission and transformation equipment, as well as professional technical management of high-voltage switchgear. He has led or participated in more than 30 scientific research projects at various levels, including those funded by State Grid Corporation of China and the Chongqing Municipal Government. He has received over ten provincial- and ministerial-level science and technology awards, published 13 high-quality academic papers in domestic and international journals, been granted 12 patents, and spearheaded the formulation and revision of 15 national, industrial, and State Grid corporate standards.

Poster Session

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ER019	Paper Title: Research on Carton Set Design for a Semiconductor Equipment Manufacturer Authors: Lan Zhao, Youxin Tan, Andrew Lim, Xiaoping Qiu, Xiaobo Zhang
ER041	Paper Title: Intelligent Optimal Regulation Strategy of Valves in High Altitude Cabin Circulating Water System Using MFAPC and AS-GWO Authors: Yi Xie, Tianxiang Dong, Haisong Lan, Yuhang Zhao, Yihua Zhou, Yiwen Qi
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ER026	Paper Title: Application and Integration of Three-line Laser Structured Light Sensor in Embodied Intelligent Welding Robots: Measurement Principles and Hand-eye Calibration Author: Debao Li
ER042	Paper Title: Real-Time Semantic Segmentation via Deeply Fused Dual-Resolution Networks Authors: Jiahuan Liu, Xiaodong Zhao, Haotian Gu, Jiawei Qiu
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Poster Session

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ER059	Paper Title: WH-FBCNN: A novel cross-subject SSVEP EEG decoding method combining wavelet transform and harmonic reweighting Authors: Ziqi Zhou, Di Chen, Simin Lai
ER055	Paper Title: Development of a thread winding device and its integration with an industrial robot Authors: Primož Podržaj
ER047	Paper Title: RLESO-Based Command-Filtered Backstepping Tracking Control of Electrically Driven Flexible-Joint Manipulators Authors: Yingfeng Pan
ER011	Paper Title: YOLO-Augmented ORB-SLAM3: Dynamic Object Elimination for Robust Visual SLAM in Dynamic Environments Authors: Shiyuan Wang, Dongsheng Jing, Peng Cai, Dongyuan Lin, Yunfei Zheng, Wei Yu, Shiyuan Wang

Poster Session

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