



# Conference Program

## 2024年第四届工业自动化、 机器人与控制工程国际会议

2024 4<sup>th</sup> International Conference on Industrial Automation,  
Robotics and Control Engineering

2024年11月15-17日 中国·成都

主办单位: 西南交通大学、北京航空航天大学、中国体视学学会

承办单位: 西南交通大学计算机与人工智能学院、人工智能研究院

协办单位: 北京邮电大学、湖南科技大学、北京理工大学、重庆大学

技术支持: CoreShare科享学术交流中心



# WELCOME

## Dear Distinguished Participants,

We are excited to announce the 2024 4<sup>th</sup> International Conference on Industrial Automation, Robotics and Control Engineering (IARCE 2024), taking place in Chengdu, China on November 15-17, 2024. This conference is organized by Southwest Jiaotong University, Beihang University and Chinese Society for Stereology, hosted by School of Computing and Artificial Intelligence, Institute of Artificial Intelligence, Southwest Jiaotong University, co-organized by Beijing University of Posts and Telecommunications, Hunan University of Science and Technology, Beijing Institute of Technology and Chongqing University, supported by CoreShare Academic Exchange Center.

We would like to express our sincere gratitude to all those who have dedicated their time and expertise towards making this event a reality. Our deepest gratitude goes to our esteemed General Chairs: Prof. Yang Li and Prof. Tianrui Li, General Co-Chairs: Prof. Huihua Yang, Prof. Gang Wang, Prof. João Manuel R. S. Tavares for their invaluable contributions that have greatly contributed to the success of our preparations. Furthermore, we extend our appreciation to our distinguished Organizing Committee Chairs: Prof. Ming Lu and Prof. Yuzhu Guo, Keynote Speakers: Prof. Dezhong Yao, Prof. Honghai Liu, Prof. Badong Chen and Prof. Xingming Zhao for enriching the program with their insightful inputs.

The conferences aim to serve as a platform for sharing cutting-edge research and findings in industrial automation, robotics and control engineering. We hope that through lively discussions and networking opportunities, participants will not only exchange ideas but also forge new partnerships and collaborations that will lead to significant advancements in these fields.

We eagerly anticipate your presence at IARCE 2024, where we are confident that knowledge exchange will be both fruitful and enlightening. Moreover, we encourage you to seize this opportunity to explore the vibrant city of Chengdu and enjoy the rich cultural experiences it has to offer.

Thank you!



# COMMITTEE LIST

## ➤ General Chairs

Yang Li——*Beihang University, China*

Tianrui Li——*Southwest Jiaotong University, China*

## ➤ General Co-Chairs

Huihua Yang——*Beijing University of Posts and Telecommunications, China*

Gang Wang——*Beijing Institute of Technology, China*

João Manuel R. S. Tavares——*Universidade do Porto, Portugal*

## ➤ Program Chairs

Xiaobo Zhang——*Southwest Jiaotong University, China*

Huiling Chen——*Wenzhou University, China*

Filippo Sanfilippo——*University of Agder, Norway*

Ruwan Gopura——*University of Moratuwa, Sri Lanka*

## ➤ Organizing Committee Chairs

Ming Lu——*Hunan University of Science and Technology, China*

Yuzhu Guo——*Beihang University, China*

## ➤ Publication Chairs

Guijian Xiao——*Chongqing University, China*

Gheorghe-Daniel Andreescu——*Politehnica University Timisoara, Romania*

## ➤ Publicity Chair

Yue Zhao——*Chongqing University of Posts and Telecommunications, China*

## ➤ Session Chairs

Jiegang Peng——*University of Electronic Science and Technology of China, China*

Jianwen Huo——*Southwest University of Science and Technology, China*

Lin Gan——*Northwestern Polytechnical University, China*

Xiaolin Qin——*University of Chinese Academy of Sciences, China*

Naipeng Li——*Xi'an Jiaotong University, China*

Laihao Yang——*Xi'an Jiaotong University, China*

## ➤ Finance Chair

Changchuan Chen——*Chongqing University of Posts and Telecommunications, China*

# COMMITTEE LIST

## ➤ Local Chairs

Hongjing Liang—*University of Electronic Science and Technology of China, China*

Hao Wang—*Sichuan University, China*

## ➤ Program Committee

Ryszard S. Choras—*UTP University of Sciences and Technology, Poland*

Zhiwen Chen—*Central South University, China*

Guijian Xiao—*Chongqing University, China*

## ➤ Technical Committee

Angel P. Del Pobil—*Jaume I University, Spain*

Ryszard S. Choras—*UTP University of Sciences and Technology, Poland*

Ioan Dumitrache—*University POLITEHNICA of Bucharest, Romania*

Francisco Escribano—*Titular de Universidad, Spain*

Lanying Yang—*Chengdu University of Technology, China*

Pavlo Maruschak—*Ternopil Ivan Puluj National Technical University, Ukraine*

Glen Bright—*The University of KwaZulu-Natal, South Africa*

Priti Srinivas Sajja—*Sardar Patel University, India*

Qiang (Jason) Zhang—*The University of Alabama, USA*

Les Sztandera—*Philadelphia University, USA*

Yu-Sheng Lu—*National Taiwan Normal University, China*

Jacques Malenfant—*Sorbonne Université, France*

António E. Ruano—*Instituto Superior Técnico and Universidade do Algarve, Portugal*

Alireza Heidari—*California South University (CSU), USA*

Ivan Ganchev Ivanov—*Konstantin Preslavsky University of Shumen, Bulgaria*

Shen Yin—*Norwegian University of Science and Technology, Norway*

Gang-Len Chang—*University of Maryland, USA*

Chao Peng—*University of Electronic Science and Technology of China, China*

Ahmad Taher Azar—*Prince Sultan University, Kingdom Saudi Arabia*

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For the committee list, please visit <https://www.iarce.org/comm.html>.

# GENERAL INFORMATION

## ★ Registration

The registration desk will be situated at Hotel Lobby of Howard Johnson Zunyue Hotel Chengdu(成都尊悦豪生酒店一楼大厅) during the following time: 10:00-18:00, Friday, November 15, 2024.

## ★ Remarks

Conference will provide coffee breaks, lunch and dinner during conference days, beyond the fixed menu will be on personal bills.

## ★ A Polite Request to All Participants:

Participants are requested to join this onsite conference in a timely fashion. Presenters are reminded that the time slots should be divided fairly and equally by the number of presentations and that they should not be overrun. The session chairs are asked to assume this timekeeping role and to summarize key issues in each presentation.

## ★ Dress Code:

Business Casual, formal, or national custom is recommended.

## ★ Certificates

All the presenters will be awarded a participation certificate of attendance that is presented in the scheduled session, certifying the paper has been presented at the conference.

## ★ Awards

Certificates of Best Paper & Best Oral Presentation Paper & Best Poster are settled up in our conference.

## ★ Time difference

GMT+8, Beijing, China Standard Time.

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

## ★ Presentation

Keynote Speech: 40 mins, including Q&A.

Oral Session: 15 mins, including Q&A.

Poster Presentation: Poster size (A0) Width\*Height: A0 (1189mm×841mm)

# VENUE INFORMATION

**Howard Johnson Zunyue Hotel Chengdu**

**成都尊悦豪生酒店**

**Address: 528 Yingbin Ave, Jinniu District, Chengdu, Sichuan Province, China**

**地址：中国四川省成都市金牛区迎宾大道 528 号**



- 酒店距离成都双流国际机场-T2 航站楼，驾车距离 26.1 公里,约 40 分钟行程。
- 酒店距离成都西站，驾车距离 4.7 公里,约 9 分钟。
- 酒店距离犀浦东站，驾车距离 5.9 公里,约 12 分钟。

**高级房（大床房/双床房）—— 450RMB 含早**

**舒适园景房（大床房/双床房）—— 500RMB 含早**

**电话：18190979018/15208297010（伏经理）**

**预定请说明参加 IARCE 2024 会议**

# DAY 1

Nov. 15, 2024 | Friday

Address: Hotel Lobby of Howard Johnson Zunyue Hotel  
Chengdu

签到地点：成都尊悦豪生酒店一楼大厅

10:00-18:00 Onsite Registration & Sign in

# DAY 2

Nov. 16, 2024 | Saturday

Address: Second Floor, Howard Johnson Hall

地点：成都尊悦豪生酒店二楼豪生厅

8:30-18:00 Conference Session

# DAY 3

Nov. 17, 2024 | Sunday

Free Day

Social Networking Event

# CONFERENCE PROGRAM

Nov. 15, 2024   GMT+8   Friday 成都尊悦豪生酒店 一楼大厅		
10:00-18:00	Registration & Conference Kits Collection	
Nov. 16, 2024   GMT+8   Saturday 成都尊悦豪生酒店 二楼豪生厅		
8:30-8:45	Opening Address by the Vice-principal of Southwest Jiaotong University	Zhengyou He
	Opening Address	Prof. Yang Li
8:45-9:10	Group Photo	
9:10-9:50	Keynote Speaker I	Prof. Dezhong Yao
9:50-10:30	Keynote Speaker II	Prof. Honghai Liu
10:30-10:50	Coffee Break	
10:50-11:30	Keynote Speaker III	Prof. Badong Chen
11:30-12:10	Keynote Speaker IV	Prof. Xingming Zhao
12:10-14:00	Lunch Time	西餐厅 二楼
14:00-18:00	Oral Session	Prof. Jianwen Huo
18:00-18:30	Award Ceremony	
	Closing Ceremony	PhD. Xiaobo Zhang
18:30-20:00	Dinner Time	玉莲厅 三楼



# CONFERENCE SESSION



Nov. 16, 2024 | GMT+8 | Saturday  
二楼 豪生厅

Morning Session

Host: Prof. Yang Li——*Beihang University, China*


Opening Ceremony		8:30-8:45
	<b>Zhengyou He</b> Vice-principal of Southwest Jiaotong University	
	<b>Prof. Yang Li</b> Beihang University, China	

8:45-9:10  
Group Photo

Venue: Outdoor Terrace (户外草坪)



Keynote Speech I	9:10-9:50
<b>Prof. Dezhong Yao</b> University of Electronic Science and Technology of China, China <i>AIMBE Fellow</i>  Host: Tianrui Li—— <i>Southwest Jiaotong University, China</i>	

	<b>Brief Introduction:</b> Dezhong Yao received PhDs from Chengdu University of Technology (1991) and Aalborg University (2005). He became a faculty member with University of Electronic Science and Technology of China (UESTC) since 1993, a full professor since 1995. He won the NSFC ‘Outstanding Youth Research Found’ in 2005, selected as Yangtze River Scholar Professor in 2006. He innovated the REST technique for zero EEG reference at infinity, and proposed the concept of ‘Brain-Apparatus Communication’ (BAC) to integrate brain-computer interaction and brain-internal organ
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# CONFERENCE SESSION

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interaction. He set up the School of Life Science and Technology at UESTC in 2001. He has cultivated 50+ PhD, published 6 books including “The Physics and Mathematics of Electroencephalogram(CRC Press, 2024)”, 200+ journal papers with Google scholar citation>19000, hosted 20+ conferences including 20th IOP (2021), presented 100+ talks. He is the Fellow of American Institute for Medical and Biological Engineering (AIMBE), the winner of the Roy John Award of the EEG and Clinical Neuroscience Society, the chief-editor of the BAC journal. He is the chairman of the Chinese EEG Consortium, the previous vice-chairman of the Chinese Society of Biomedical Engineering.

**Speech Title:** Musical Neuromodulation 3.0

**Abstract:** Based on our years’ work, the talk is supposed to firstly introduce the basic definition of neuromodulation, and then along with music as the modulation field, supposed three generations of music neuromodulation are illustrated: Generation 1.0 open-loop music neuromodulation and its application for cognition and aging protection; Generation 2.0, scale-free brainwave music based closed-loop music neuromodulation technique and its potential application; and Generation 3.0, brain-apparatus communication (BAC) based music neuromodulation and its potential application in rehabilitation.

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**Keynote Speech II**

**9:50-10:30**

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**Prof. Honghai Liu**

Harbin Institute of Technology, Shenzhen, China

***IEEE Fellow, IET Fellow and JSPS Fellow***

Host: Huihua Yang—*Beijing University of Posts and Telecommunications, China*



**Brief Introduction:** Honghai Liu (Member, Academia Europaea; Fellow, IEEE/IET), received the PhD in intelligent robotics from King’s College London, UK. He is a Professor at State Key Lab of Intelligent Technology and Systems, HIT Shenzhen; He is also a Professor at the University of Portsmouth, UK. He is interested in multimodal sensing, neurorobotics and embodied intelligence for theory and applications with an emphasis on

approaches that could make contribution to the intelligent connection of perception to action using contextual information. He has authored/co-authored more than 400 peer-reviewed journals and conference papers with several best paper awards.

**Speech Title:** Multimodal Sensing and Understanding for Motor-impaired Research and Applications

**Abstract:** The talk first presents the state of the art in multimodal sensing and understanding for motor-impaired research with focuses on neuroprosthetics and afterstroke rehabilitation. It then discusses principles of individual sensing modalities, their combination and their pathways to motor cortex during muscle contraction. Next the talk focuses on wearable sonomyography for neuroprosthetic control and corticomuscular coherence based assessment for afterstroke rehabilitation. The talk is concluded with future directions and challenges.

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# CONFERENCE SESSION

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10:30-10:50  
Coffee Break



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Keynote Speech III

10:50-11:30

**Prof. Badong Chen**  
Xi'an Jiaotong University, China

Host: Xiaobo Zhang—*Southwest Jiaotong University, China*

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**Brief Introduction:** 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 signal processing, machine learning, artificial intelligence and robotics. He has authored or coauthored over 300 articles in various journals and conference proceedings (with 14000+ 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, Neural Networks and Journal of The Franklin Institute. 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.

**Speech Title:** Information Theoretic Learning

**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.

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# CONFERENCE SESSION



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Keynote Speech IV11:30-12:10

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**Prof. Xingming Zhao**  
Fudan University, China

Host: Yang Li—Beihang University, China



**Brief Introduction:** Xing-Ming Zhao received his PhD degree from the University of Science and Technology of China. Currently, he is a distinguished professor and vice dean of the Institute of Science and Technology for Brain Inspired Intelligence, Fudan University, China. He is also the chair of Shanghai Society for Bioinformatics. He focuses on the interdisciplinary research between biomedicine and artificial intelligence. He has published more than 150 papers in peer-reviewed journals, e.g. Nature and Cell. He is the senior member of IEEE, Co-Chair of IEEE SMC Technical Committee on Systems Biology and Vice-Chair of ACM SIGBIO China. He is also the lead guest editor and the editorial member of several journals, e.g. IEEE/ACM TCBB, Neurocomputing, Journal of Theoretical Biology, IET Systems Biology, and so on.

**Speech Title:** Data Driven Exploration of Brain Disorders

**Abstract:** In this talk, I'll introduce our recent work on brain disorders. Especially, I'll present our works on noncoding mutations and their regulations underlying brain disorders, and hot to explain their roles in various brain traits. I'll also introduce two subtypes identified for autism, a developmental brain disorder, based on gut microbiome, image and behavior data, which is important for future precise intervention and prevention of the disorder.



Lunch Time  
12:10-14:00 | Nov. 16, 2024 | Saturday  
西餐厅 二楼

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**Nov. 16, 2024 | GMT+8 | Saturday**

**二楼 豪生厅**

**Oral Session**



**Host: Jianwen Huo—*Southwest University of Science and Technology, China***

14:00-14:15 R010	Title: Deformation Analysis of Soft Pneu-Net Actuators in Free Space with Different Chamber Spacing Authors: Yanyan Wu, Mingyue Lu, Li Ding, Xing Ge, Yuyao Wu, and Xia Ye
14:15-14:30 R006	Title: Underwater Pipeline Defect Detection Method based on Active Electric Field Authors: Jiegang Peng, Minan Yang, Wenjie Yang, Xu Lin
14:30-14:45 R007	Title: Improvement of Electric Fish Optimization Algorithm for Standstill Label Combined with Levy Flight Strategy Authors: Wangzhou Luo, Hailong Wu, Jiegang Peng, Lin Xu
14:45-15:00 R018	Title: Self-data-driven Modeling for Fault Diagnosis of RV Reducers in Industrial Robots Authors: Naipeng Li, Huitong Li, Yang Tan, Huan Liu, Yaguo Lei
15:00-15:15 R020	Title: A Multi-scale Residual Network based on the Multi-head Attention Mechanism for Motor Imagery EEG Decoding Authors: Ketong Li, Xiaodong Liu, Qian Chen, Peng Chen
15:15-15:30 R021	Title: INN: A Deep Correction Network for High-Dynamic Inertial Navigation Authors: Tao Gu, Li Cong, Jing Yang, Yuzhu Guo, Lina Wang

**15:30-16:00 Coffee Break and Poster Session**



16:00-16:15 R027	Title: A Control Algorithm for an Aerial Co-Manipulation System Authors: Fan Chen, Xinyue Zhang, Yuxin Li, Yixin Wang
16:15-16:30 R028	Title: SNLADRCI for Aerial Dexterous Manipulation Authors: Xinyue Zhang, Fan Chen, Yuxin Li, Jingyue Luo
16:30-16:45 R030	Title: Design and Research of Bionic Ankle Joint based on Tensile Structure Authors: Yang Li, Xiangyu Ma, Shuang Liang, Qi Tuo, Tianhong Luo
16:45-17:00 R037	Title: Research on Testing Method for Broken Rail Monitoring Equipment Based on Ensemble Learning Authors: Qi Wang, Congcong Liu, Yulong Xing, Yu Zhao
17:00-17:15 R039	Title: Multi-Scale Vision Transformer with Local-Global Attention Authors: Ruomiao Zhang, Shengdong Du, Jie Hu, Xiaole Zhao, Yan Yan

17:15-17:30 R040	Title: Orbital Analysis of Passive Dynamic Walker with Dual Arms Authors: Zhongqu Xie, Xue Gong, Long Li, Shichao Zhou, Yulin Wang		
17:30-17:45 R011	Title: A Defense Framework for Backdoor Attacks in Federated Learning Based on Client-Server Detection Authors: Ding Chen, Tianrui Li, Yu Cai, Rasha Al-Huthaifi , Wei Huang		
17:45-18:00 R045	Title: Trust Mechanisms in Decentralized Federated Learning: Enhancing Model Parameter Aggregation Authors: Xinyi Fan, Jielei Chu, Zhaoyu Li, Jiangtao Hu, Tianrui Li		
Closing Ceremony	Award Ceremony		
	Closing Address		<b>PhD. Xiaobo Zhang</b> Southwest Jiaotong University, China

Dinner Time



18:30-20:00

Venue: 玉莲厅 三楼

Poster Session	
R008	Title: Research and Practice of CDN Accelerating Hot Internet Content Based on OLT
R002	Title: Servo system Cascade Linear Active Disturbance Rejection Control Based on Motor models
R017	Title: MIFF: A Unified Framework for Hyperspectral Image Classification with Multimodal Data
R019	Title: Research on Calibration Method of Joint Reduction Ratio for Industrial Robot Considering Dynamic Factors
R022	Title: NLOS error suppression method for UWB indoor positioning based on TDOA
R024	Title: Underactuated Ship Heading Control in harbor Based on Model-Free Adaptive Sliding Mode Control
R025	Title: Trajectory tracking control of space robotic arm based on adaptive non-singular fast terminal sliding mode control
R026	Title: Development and application of SCM system based on the IoT
R029	Title: An Intelligent Video Surveillance Recognition and Warning Method for Tornadoes
R033	Title: A Small Target Detection Model Based on An Improved RT-DETR
R034	Title: A Dual-Graph Learning Framework with Sparse Adaptive Embedding for EEG Emotion Recognition
R041	Title: Personalized Federated Learning with Collaborative Aggregation Networks for Multi-Site Brain Disorder Diagnosis
R042	Title: Shared-Specific Feature Enhancement and Dual Distilled Contextual Graph Refinement Network for Multimodal Conversational Emotion Recognition
R004	Title: Analysis of Multi-process Machining Errors of Frame Parts Based on State Space
R012	Title: A Low-Voltage Ride-Through Control Strategy for two-stage T-type three-level photovoltaic inverter under asymmetric
R032	Title: Control Algorithm of Two-wheeled Mobile Robot Based on Active Disturbance Rejection Control
R038	Title: Assembly sequence planning algorithm based on topological ordering and its simulation system development
R035	Title: Multi-Path Restorative Pre-training with Localized Adaptive Graph Convolution for 2D Tooth Segmentation
R044	Title: FedTMatch: Self-Supervised Federated SemiSupervised Learning with Dynamic Threshold

### Listener

R1001	Zhaifang Zhang
R1002	Listener
R1003	Shijie Zhao

# UPCOMING CONFERENCES

2025 4<sup>th</sup> International Conference on Frontiers of Artificial Intelligence  
and Machine Learning (FAIML 2025)  
April 25-27, 2025 Shenyang, China



2025 5<sup>th</sup> International Symposium on Intelligent  
Robotics and Systems (ISoIRS 2025)  
June 13-15, 2025 Chengdu, China



The 2025 4<sup>th</sup> International Conference on  
Service Robotics (ICoSR 2025)  
July 25-27, 2025 Guangzhou, China





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# 2024年第四届工业自动化、 机器人与控制工程国际会议

2024 4<sup>th</sup> International Conference on Industrial Automation,  
Robotics and Control Engineering

## Organized by



西南交通大学  
Southwest Jiaotong University



北京航空航天大学  
BEIHANG UNIVERSITY



中国体视学学会  
CHINESE SOCIETY FOR STEREOLOGY

## Hosted by



西南交通大学 计算机与人工智能学院  
School of Computing and Artificial Intelligence, Southwest Jiaotong University



西南交通大学 人工智能研究院  
Institute of Artificial Intelligence, Southwest Jiaotong University

## Co-organized by



北京邮电大学  
Beihang University of Posts and Telecommunications



湖南科技大学  
Hunan University of Science and Technology



北京理工大学  
BEIJING INSTITUTE OF TECHNOLOGY



重庆大学  
CHONGQING UNIVERSITY

## Supported by



CoreShare  
科学学术

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