Contents

1. Invitation

On behalf of the IEEE Industrial Electronics Society (IEEE IES) and Beihang University, I cordially welcome all delegates to join the 22nd IEEE International Conference on Industrial Informatics (INDIN 2024).

The 22nd IEEE International Conference on Industrial Informatics will provide a forum for presentation and discussion of the state-of-art and future perspectives of industrial information technologies. Industry experts, researchers and academics are gathering together to share ideas and experiences surrounding frontier technologies, breakthroughs, innovative solutions, research results, as well as initiatives related to industrial informatics and their applications. Over 300 experts and scholars worldwide will share their latest research results and innovative thinking around hot topics of industrial applications. Topics include industrial cyber-physical system applications, artificial intelligence in industrial applications, fault diagnosis and security, software engineering, robotics, mechatronics, factory automation, digital twins, connected and autonomous vehicle, intelligent transportation system, and sustainable energy system.

IEEE INDIN 2024 received 474 full papers from 30 countries and regions, 366 papers were accepted.

IEEE INDIN 2024 has
- 4 Tutorials
- 8 Keynote Speeches
- 38 Paper Sessions
- 1 Poster Session
- 2 Industry Forums

IEEE INDIN 2024 is co-sponsored by the IEEE IES, JiangSu Association of Automation, Shaoxing University, Beihang University, North China Electric Power University, and Beijing Institute of Technology. It's a great pleasure for the IEEE IES, JiangSu Association of Automation, Shaoxing University, Beihang University, North China Electric Power University, and Beijing Institute of Technology to invite prospective authors to discuss the developments and challenges for development of industrial information technologies. I would like to take this opportunity to express my gratitude to the co-sponsors and technical co-sponsors who helped prepare this conference. Special thanks to all authors, plenary speakers, panel chairpersons, reviewers, and delegates for their great concern and vigorous support for this conference. Without their kind cooperation, hard work and sincerity, this event simply would not be possible.

IEEE INDIN 2024 is to be held in Beijing, which is the capital city of the People's Republic of China. Beijing is the center of politics, economy, finance, commerce, logistics, technology, culture, and education in China. As an ancient city with a long history, Beijing has been the heart of China's history for centuries. There are many buildings of any age that have at least some national historical significances. I wish all of you have a successful, memorable, and pleasant stay in Beijing, China.

Hui Zhang
Kamal Al-Haddad
General Chair of IEEE INDIN 2024

2. Organizing Committee

Honorary Chairs

Armando W. Colombo (DE)	Xinghuo Yu (AU)
Makoto Iwasaki (JP)	Yang Shi (CA)
Huijun Gao (CN)	Shichun Yang (CN)
Xiangyang Xu (CN)	Jun Li (CA)

Conference General Chairs

Hui Zhang (CN)	Kamal Al-Haddad (CA)

Technical Program Chairs

Luis Gomes (PT)	Fang Fang (CN)
Ya-Jun Pan (CA)	Bin Zhang (US)
Huiping Li (CN)	Bin Yu (CN)
Yan Shi (CN)	Weida Wang (CN)
Shihua Li (CN)	

Publications Chairs

Jinhua She (JP)	Roberto Oboe (IT)
Fei Miao (US)	Dawei Shi (CN)
Akshay Rathore (SG)	Caizhi Zhang (CN)
Dawei Pi (CN)	

Publicity Chairs

Benedikt Lücke (GE)	Fengjun Li (US)
Tao Yang (CN)	Amir Farakhor (US)
Claudia-Melania Chituc (DE)	Yunfeng Hu (CN)

Special Sessions Chairs

Mingxi Liu (US)	Hongyi Li (CN)
Fei Gao (FR)	

Industry Forum Chairs

Victor Huang (US)	Michael Condry (US)
Yebin Wang (US)	Guizhen Yu (CN)
Yixin Dai (CN)	

Financial Chairs

Kunwu Zhang (CA)	Jicheng Chen (CN)

Local Arrangement Chairs

Peng Dong (CN)	Xinhua Liu (CN)

Bingtao Ren (CN)   Zhiyang Ju (CN)

Award Chairs

Jing Lin (CN)   Huiping Li (CN)

Huazhen Fang (US)   Chen Lv (SG)

3. Important Information

Time: August 17–20, 2024
Venue: Wyndham Beijing North, Beijing (Changping District)
Address: 317 Changping Road, Changping District, Beijing, China
Agenda: August 17–20, 2024, Academic Lectures and Discussion
Official Languages: English

Registration
Registration Time: August 17, 8:00–22:00
Registration Desk: Wyndham Beijing North, Beijing (Changping District)

Contacting the Organizing Committee
Contacting Person:
● Chenfei Hou
E-mail: INDIN2024@gmail.com
Tel: +86 15653581535

● Xin Gao
E-mail: INDIN2024@gmail.com
Tel: +86 13718040032

Website of INDIN2024: https://indin2024.ieee-ies.org/index.html
Website of IEEE IES Conferences Community:
https://confcomm.ieee-ies.org/home/welcome

4. Instruction for Oral and Poster Presentations

Oral Presentation

- Oral Presentation Time: 15 minutes (12 minutes oral presentation + 3 minutes discussion);
- Each speaker is required to meet his/her session chairs in the corresponding session rooms 10 minutes before the session starts and copy the slides to the computer;
- Each session room is equipped with a projector and a PC (with Microsoft Windows and Microsoft Power-Point). Please make sure that your files are compatible and readable with our operation system by using commonly used fonts and symbols.

Poster Presentation

- All Extended Abstracts accepted by the conference will be presented in form of posters.
- The conference will provide an exhibition board (width 1m, height 2.5m) for each poster paper. The poster print size is 78 cm(H)×58 cm(W). The boards will be arranged in order of the paper in the final program. Tape and other materials will be provided on site, and volunteer-assistants will give necessary help. Posters are required to be condensed and attractive. The characters should be large enough so that they are visible from 1 meter apart.

  IMPORTANT NOTICE: For all poster presentation, please email your poster to INDIN2024@gmail.com, or upload your poster to the website: https://evt.miting.net.cn/evt/p/event/435907 before Aug. 15, 2024; we will print and post them for you. If you submit them later than Aug. 15, 2024, please print and post them by yourself at the conference.

5. Transportation, Accommodation, and Venue Location

5.1 Transportation

- **Beijing Capital International Airport**

About 37 kilometers
Taxi (Recommended): About 45 minutes; About 150 yuan
Subway: About 2 hours
Take Capital Airport Line (Toward Beixinqiao) → Get on at Capital Airport T3 Station → Get off the subway at Sanyuanqiao Station → Transfer to Subway Line 10 (Toward Taiyanggong) → Get off the subway at Xitucheng Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel

- **Beijing Daxing International Airport**

About 90 kilometers
Taxi (Recommended): About 1 hour and 30 minutes; About 300 yuan
Subway: About 1 hour and 50 minutes
Take Daxing Airport Line (Toward Caoqiao) → Get on at Daxing Airport Station → Get off the subway at Caoqiao Station → Transfer to Subway Line 19 (Toward Mudanyuan) → Get off the subway at Mudanyuan Station → Transfer to Subway Line 10 (Toward Xitucheng) → Get off the subway at Xitucheng Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel

- **Beijing South Railway Station**

About 34.6 kliometers
Taxi: About 1 hour and 15 minutes; About 115yuan
Subway: About 1 hour and 30 minutes
Take Subway line 4 (Toward Anheqiao North) → Get on at Beijing South Station → Get off the subway at Xizhimen Station → Transfer to Subway Line 13 (Toward Dongzhimen) → Get off the subway at Qinghe Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel

- **Beijing West Railway Station**

About 32 kilometers
Taxi: About 1 hour; About 100 yuan
Subway: About 1 hour and 30 minutes

Take Subway Line 9 (Toward National Library) → Get on at Beijing West Station → Get off the subway at Liuliqiao Station → Transfer to Subway Line 10 (Toward Lianhuaqiao) → Get off the subway at Xitucheng Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel

■ **Beijing Railway Station**

About 30 kilometers

Taxi: About 52 minutes; About 100 yuan

Subway: About 1 hour and 30 minutes

Take Subway Line 2 (Toward Chongwenmen) → Get on at Beijing Station → Get off the subway at Xizhimen Station → Transfer to Subway Line 13 (Toward Dongzhimen) → Get off the subway at Qinghe Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel

■ **Beijing Fengtai Railway Station**

About 40 kilometers

Taxi: About 1 hour; About 130 yuan

Subway: About1 hour and 30 minutes

Take Subway Line 10 (Toward Niwa) → Get on at Fengtai Station → Get off the subway at Xitucheng Station → Transfer to Changping Line (Toward Changping Xishankou) → Get off the subway at Life Science Park (Exit B1) → Walk for 17 minutes to the hotel
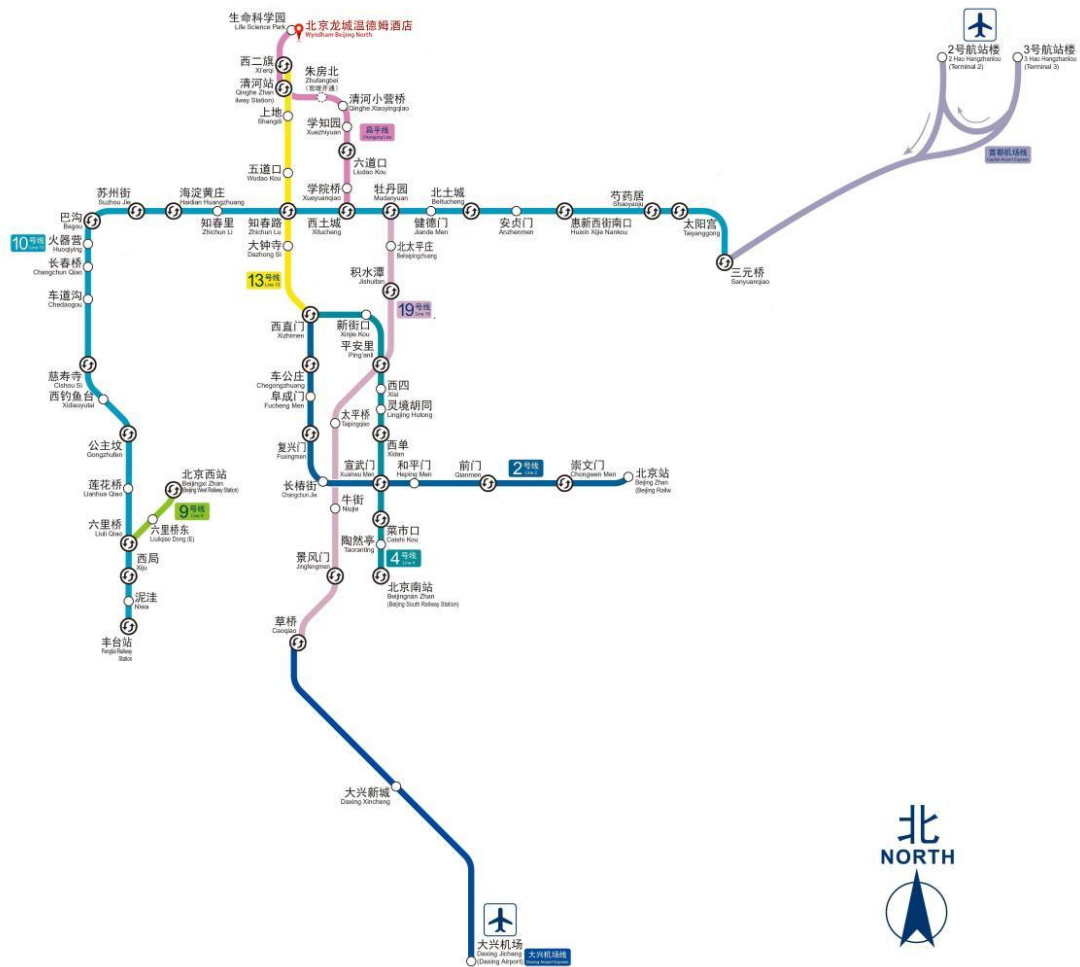
生命科学园
Life Science Park
北京龙城温德姆酒店
Wyndham Beijing North

西二旗
Xi'erqi
朱房北
Zhufangbei
（暂缓开通）

清河站
Qinghe Zhan
(way Station)
清河小营桥
Qinghe Xiaoyingqiao

上地
Shangdi
学知园
Xuezhiyuan
昌平线
Changping Line

五道口
Wudao Kou
六道口
Liudao Kou

苏州街
Suzhou Jie
海淀黄庄
Haidian Huangzhuang
学院桥
Xueyuanqiao
牡丹园
Mudanyuan
北土城
Beitucheng
芍药居
Shaoyaoju

巴沟
Bagou
知春里
Zhichun Li
知春路
Zhichun Lu
西土城
Xitucheng
健德门
Jiande Men
安贞门
Anzhenmen
惠新西街南口
Huixin Xijie Nankou
太阳宫
Taiyanggong

10号线
火器营
Huoqiying
大钟寺
Dazhong Si
北太平庄
Beitaipingzhuang
三元桥
Sanyuanqiao

长春桥
Changchun Qiao
13号线
积水潭
Jishuitan

车道沟
Chedaogou
19号线
Line 19

西直门
Xizhimen
新街口
Xinjie Kou
平安里
Ping'anli

慈寿寺
Cishou Si
车公庄
Chegongzhuang
阜成门
Fucheng Men
西四
Xisi
灵境胡同
Lingjing Hutong

西钓鱼台
Xidiaoyutai
太平桥
Taipingqiao
西单
Xidan

公主坟
Gongzhufen
复兴门
Fuxingmen
宣武门
Xuanwu Men
和平门
Heping Men
前门
Qianmen
2号线
Line 2
崇文门
Zhongwen Men
北京站
Beijing Zhan
(Beijing Railw

莲花桥
Lianhua Qiao
北京西站
Beijing Zhan
(Beijing West Railway Station)
长椿街
Changchun Jie

六里桥
Liuli Qiao
9号线
Line 9
六里桥东
Liuliqiao Dong (E)
牛街
Niujie

西局
Xiju
陶然亭
Taoranting
菜市口
Caishi Kou

泥洼
Niwa
景风门
Jingfengmen
4号线
Line 4

丰台站
Fengtai Railway
Station
北京南站
Beijingnan Zhan
(Beijing South Railway Station)

草桥
Caoqiao

大兴新城
Daxing Xincheng

大兴机场
Daxing Jichang
(Daxing Airport)
大兴机场线
Daxing Airport Express

2号航站楼
2 Hao Hangzhanlou
(Terminal 2)
3号航站楼
3 Hao Hangzhanlou
(Terminal 3)

首都机场线
Capital Airport Express

北
NORTH

5.2 Accommodation

Wyndham Beijing North Hotel (5-star)

Address: 317 Changping Road, Changping District, Beijing, China

Tel: 010-80799988

King-size bed Room (one bed): 650 RMB/day (about USD 90, including 2 breakfast)
Standard Room (Double beds room): 650 RMB/day (about USD 90, including 2 breakfast)

Ramada Beijing North Hotel (4-star)

Address: 317 Changping Road, Changping District, Beijing, China-

Tel: 010-80791188

King-size bed Room (one bed): 550 RMB/day (about USD 75, including 2 breakfast)
Standard Room (Double beds room): 550 RMB/day (about USD 75, including 2 breakfast)

5.3 Venue Location

Venue: Wyndham Beijing North, Beijing (Changping District)
Address: 317 Changping Road, Changping District, Beijing, China
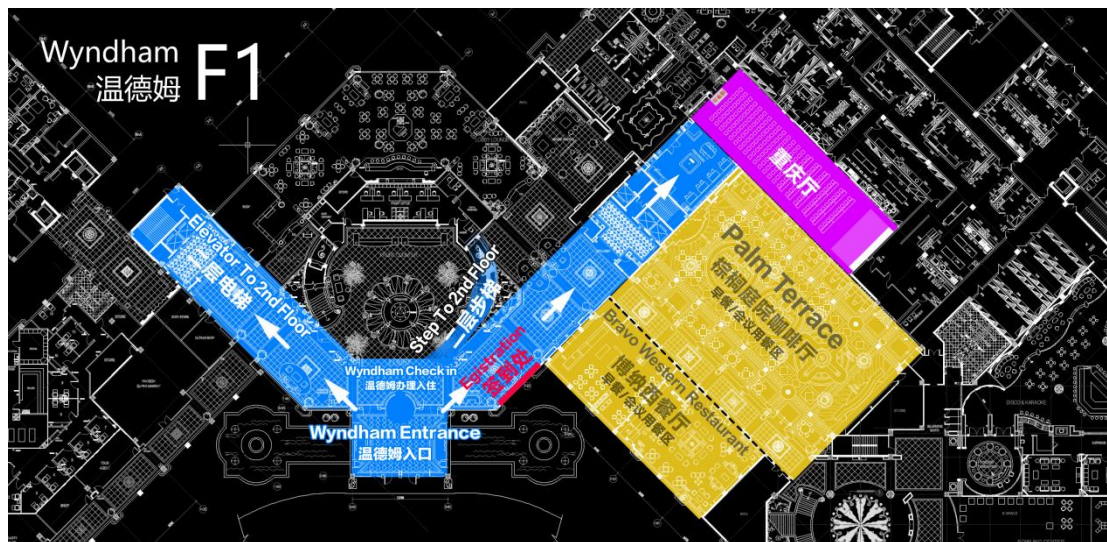Zip code: 102208
Tel: (86) 010-80799988

Venue: Ramada Beijing North Hotel, Beijing (Changping District)
Address: 317 Changping Road, Changping District, Beijing, China
Tel: (86) 010-80791188

6. Conference Center Floor Plan

Wyndham Beijing North Hotel and Ramada Beijing North Hotel Overview
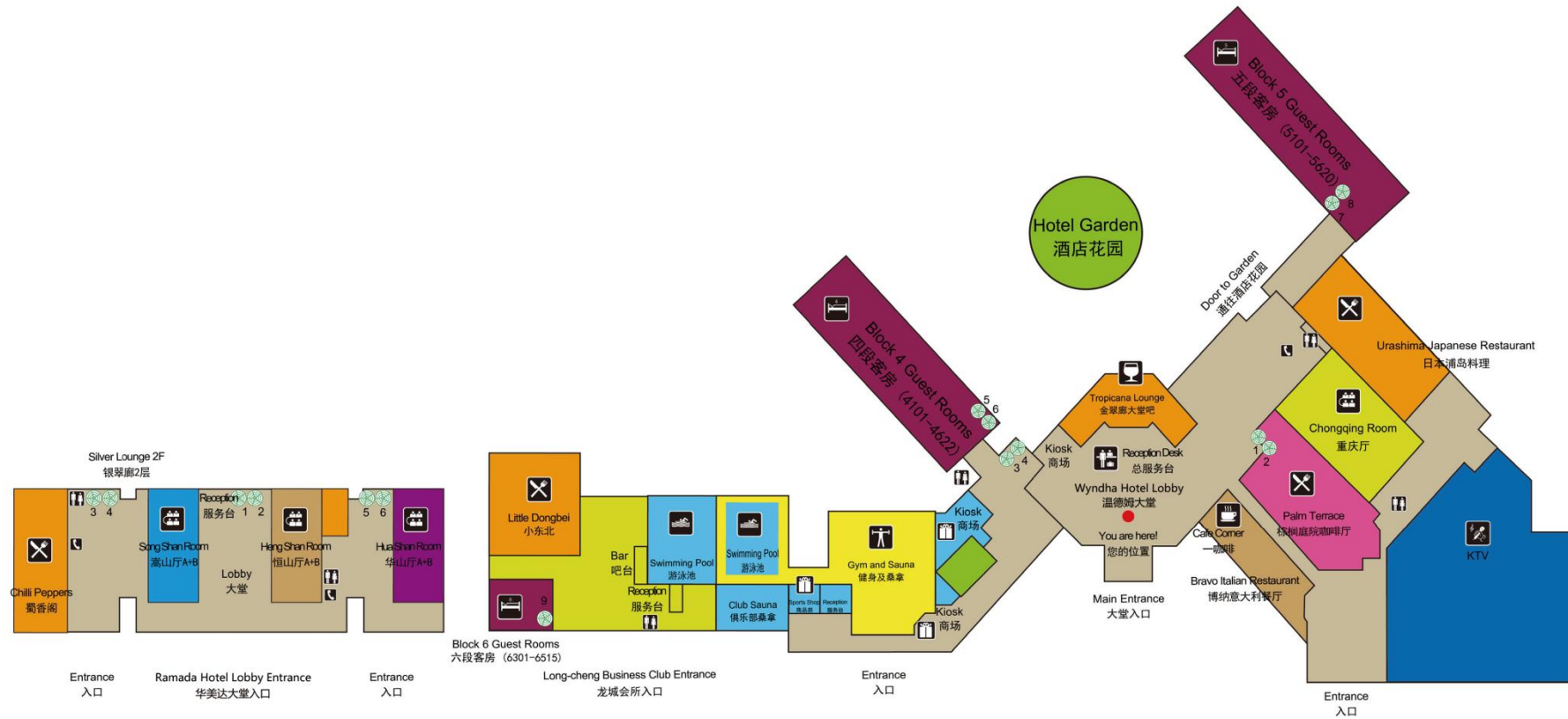
Floor Plan of Wyndham Beijing North Hotel Conference Center

Floor Plan of Ramada Beijing North Hotel

Ramada 华美达 F1

Songshan Room
嵩山厅

Hengshan Room
恒山厅

Huashan Room
华山厅

Pine Cafe
翡翠咖啡厅

Elevator
电梯

A　B

Elevator
电梯

Lobby
大堂

A　B

Elevator
电梯

A　B

To Main Lobby

Main Entrance
酒店正门

Ramada 华美达 F2

Huangshan room
黄山厅

Wuzhishan　Yimengshan
五指山　沂蒙山

Helanshan　Taihangshan
贺兰山　太行山

Huangshan room
黄山厅

A　B　C

Elevator
电梯

A　B

Elevator
电梯

Silver Lounge
大堂吧

A　B

Elevator
电梯

Elevator
电梯

A　B　C

To Main Lobby

To Main Lobby
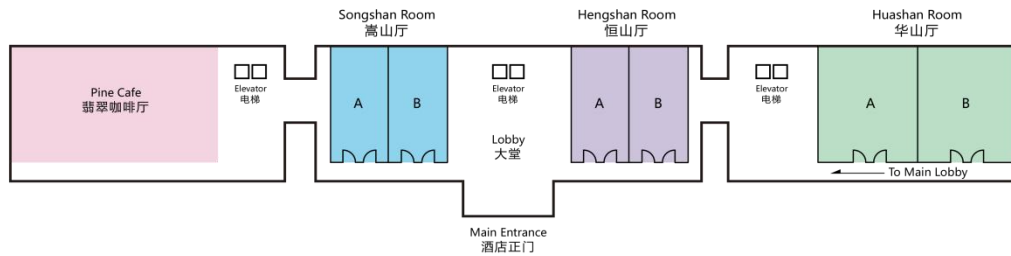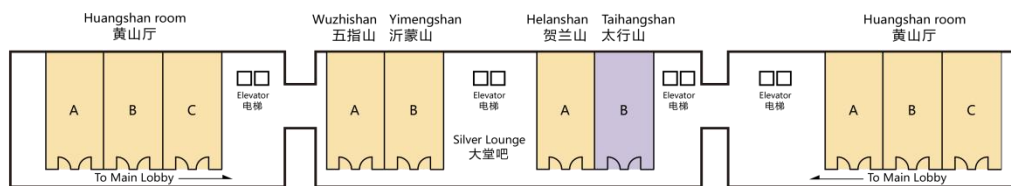
7. Schedule at A Glance

Overall Program of INDIN2024

Time	Place	Wyndham Beijing North Hotel Lobby		Huashan A	Huashan B	Hengshan A	Hengshan B
						Ramada Beijing North Hotel（F1）	
Aug. 17th Saturday	14:00-21:00	Registration	13:30-14:30				Best Paper Award Finalist-SaB01
			14:30-15:30	Tutorial 01	Tutorial 02	Tutorial 03	
			15:30-16:00			Tea Break	
			16:00-17:30			Best Application Paper Award Finalist-SaB03	Best Student Paper Award Finalist-SaB02
			17:30-18:00				
			18:00-18:30				
			18:30-20:00			Welcome Dinner	
				Tutorial 04 （Online） 14:30-18:30			

Time	Place	Wyndham Beijing North Hotel（F2） Beijing Ballroom	Huashan A	Huashan B	Hengshan A	Hengshan B	Songshan A	Songshan B	Taihangshan
					Ramada Beijing North Hotel（F1）				Ramada（F2）
Aug. 18th Sunday	8:30-8:40	Welcome Speech: Yang Shi							
	8:40-9:10	Dean Speech: Prof. Shichun Yang							
	9:10-9:50	Keynote Speech 1: Prof. Okyay Kaynak							
	9:50-10:30	Keynote Speech 2: Prof. Kamal Al-Haddad							
	10:30-10:50	Tea Break							
	10:50-11:30	Keynote Speech 3: Prof. Huijun Gao							
	11:30-12:10	Keynote Speech 4: Prof. Bhushan Gopaluni							
	12:30-13:30	Lunch							
	13:30-14:30	Industry Forum 1							
	14:30-15:30	Industry Forum 2							
	15:30-16:00	Tea Break							
	16:00-18:00	Demo	SuC01	SuC02	SuC03	SuC04	SuC05	SuC06	SuC07
	18:30-20:30	Banquet							

Time	Place	Wyndham Beijing North Hotel（F2） Beijing Ballroom	Huashan A	Huashan B	Hengshan A	Hengshan B	Songshan A	Songshan B	Taihangshan
					Ramada Beijing North Hotel（F1）				Ramada（F2）
Aug. 19th Monday	8:40-9:20	Keynote Speech 5: Prof. Makoto Iwasaki							
	9:20-10:00	Keynote Speech 6: Prof. Youmin Zhang							
	10:00-10:30	Tea Break							
	10:30-11:10	Keynote Speech 7: Prof. Jinjun Shan							
	11:10-11:50	Keynote Speech 8: Prof. Shihua Li	MoA01	MoA02	MoA03	MoA04	MoA05	MoA06	MoA07
	11:50-12:30								
	12:30-13:30	Lunch							
	13:30-15:30		MoB01	MoB02	MoB03	MoB04	MoB05	MoB06	MoB07
	15:30-16:00	Tea Break							
	16:00-18:00		MoC01	MoC02	MoC03	MoC04	MoC05	MoC06	MoC07
	18:30-20:30	Dinner							
	20:30-22:30	Social Event							

Time	Place	Ramada Beijing North Hotel Lobby	Huashan A	Huashan B	Hengshan A	Hengshan B	Songshan A	Songshan B	Taihangshan
					Ramada Beijing North Hotel（F1）				Ramada（F2）
Aug. 20th Tuesday	9:00-11:00	Poster Session TuA08	TuA01	TuA02	TuA03	TuA04	TuA05	TuA06	TuA07
	11:00-12:30								
	12:30-13:30	Lunch							

8. Opening Ceremony Speakers

■ Welcome Speech: Aug. 18, 8:30-8:40, Beijing Ballroom

Yang Shi
Professor
Fellow of Canadian Academy of Engineering (CAE)
Fellow of Engineering Institute of Canada (EIC)
Fellow of IEEE, ASME, CSME

Yang Shi, received his B.Sc. and Ph.D. degrees in mechanical engineering and automatic control from Northwestern Polytechnical University, Xi'an, China, in 1994 and 1998, respectively, and the Ph.D. degree in electrical and computer engineering from the University of Alberta, Edmonton, AB, Canada, in 2005. He was a Research Associate in the Department of Automation, Tsinghua University, China, during 1998-2000. From 2005 to 2009, he was an Assistant Professor and Associate Professor in the Department of Mechanical Engineering, University of Saskatchewan, Saskatoon, SK, Canada. In 2009, he joined the University of Victoria, and now he is a Professor in the Department of Mechanical Engineering, University of Victoria, Victoria, BC, Canada. His current research interests include networked and distributed systems, model predictive control (MPC), cyber-physical systems (CPS), robotics and mechatronics, navigation and control of autonomous systems, and energy system applications.

On teaching and mentorship, Dr. Shi received the University of Saskatchewan Student Union Teaching Excellence Award in 2007, and the Faculty of Engineering Teaching Excellence Award in 2012 at the University of Victoria (UVic), and the 2023 REACH Award for Excellence in Graduate Student Supervision and Mentorship. On research, he is the recipient of the JSPS Invitation Fellowship (short-term) in 2013, the UVic Craigdarroch Silver Medal for Excellence in Research in 2015, the 2017 IEEE Transactions on Fuzzy Systems Outstanding Paper Award, the Humboldt Research Fellowship for Experienced Researchers in 2018; CSME Mechatronics Medal (2023); IEEE Dr.-Ing. Eugene Mittelmann Achievement Award (2023). He is IFAC Council Member; VP on Conference Activities of IEEE IES and the Chair of IEEE IES Technical Committee on Industrial Cyber-Physical Systems. Currently, he is Co-Editor-in-Chief of IEEE Transactions on Industrial Electronics, and Editor-in-Chief of IEEE Canadian Journal of Electrical and Computer Engineering; he also serves as Associate Editor for Automatica, IEEE Transactions on Automatic Control, Annual Review in Controls, etc. He is a Distinguished Lecturer of IES.

■ Dean Speech: Aug. 18, 8:40-9:10, Beijing Ballroom

Shichun Yang
Dean of the School Transportation Science and Engineering, Beihang University

Shichun Yang received his Ph.D. from the College of Automotive Engineering at Jilin University in 2004, and completed his postdoctoral research at the State Key Laboratory of Automotive Dynamics Simulation in 2008. From 2013 to 2014, he was a visiting scholar at the University of Illinois, USA. Currently, he holds the position of Tenured Professor in the interdisciplinary field of "New Energy Vehicle Engineering" at the Ministry of Industry and Information Technology, Beihang University, and serves as a Ph.D. supervisor. He is also the Deputy Chairman of the Subcommittee on Electric Vehicles under the National Technical Committee of Auto Standardization, a member of the Expert Committee of the China Electric Vehicle Charging Infrastructure Promotion Alliance, a member of the Technical Expert Committee of the Electric Vehicle Industry Technology Innovation Strategic Alliance, a member of the Expert Advisory Committee of the Intelligent Vehicle Industry Technology Innovation Strategic Alliance, and an editorial board member of the Journal of Beihang University.

In recent years, leading an innovative team, he has focused on fundamental research related to the safety and efficient optimization of energy and power systems for electric vehicles, addressing China's major scientific and industrial strategic needs. He has made significant breakthroughs in the integrated design methodology of energy and power systems for electric vehicles, optimization theories, and coupled control theories for complex electromechanical systems. His achievements include winning the First Prize of the China Automotive Industry Technology Invention Award in 2016 (Ranked 1st), the Second Prize of the Ministry of Education Technology Invention Award in 2016 (Ranked 2nd), and being named the Seventh National Outstanding Scientific and Technological Worker in 2016. Over the past five years, he has been granted 22 national invention patents, published over 20 SCI-indexed papers as the first or corresponding author, authored one textbook and one monograph, and led 17 major projects, including United Nations international cooperation projects, the Thirteenth Five-Year Plan major projects, 863 Program projects, National Natural Science Foundation projects, and Science and Technology Support projects.

9. Keynote Speech

Keynote Speech 1

Aug. 18, 9:10-9:50

Beijing Ballroom

Okyay Kaynak

Turkish Academy of Sciences & Bogazici University, Urkey

From Industrial Electronics to Industrial Informatics

Abstract: This presentation will discuss the challenges that industry faces in the 21st century. An assessment of the past will be presented, discussing the profound technological changes that have occurred during the last 2 decades, especially the changes observed in the manufacturing industry. The paradigm change from industrial electronics to industrial informatics will be pointed out. This will be followed by a look at the evolution of the manufacturing paradigms. In the closing parts of the presentation, the state-of-the-art reached in industrial informatics will be given with examples and a perspective on the future will be presented, pointing out the challenges that the manufacturing industry will have to face by the end of the next decade.

Okyay Kaynak is an Emeritus Professor at Bogazici University, Istanbul, Turkey. He received his BSc (first-class honors) and PhD degrees in electronic and electrical engineering from the University of Birmingham, U.K., in 1969 and 1972, respectively. From 1972 to 1979, he worked in various industry roles, including 3.5 years as a project engineer in Saudi Arabia.

Dr. Kaynak's research interests are in intelligent systems. He has authored three books, edited five, and published over 450 papers. He is a Fellow of IEEE and has held editorial roles in several journals, including Editor-in-Chief of IEEE Trans. on Industrial Informatics and IEEE/ASME Trans. on Mechatronics. Currently, he is the Founding Editor-in-Chief of IEEE Trans. on Industrial Cyber-Physical Systems and the Springer Journal Discover Artificial Intelligence.

He has received numerous awards, including the IEEE Third Millennium Medal, the China Friendship Award (2016), the Humboldt Research Prize (2016), and Doctor Honoris Causa from Obuda University, Hungary (2020). He is also a member of the Turkish Academy of Sciences and a Fellow of the Asia-Pacific Artificial Intelligence Association (2023).

Keynote Speech 2

Aug. 18, 9:50-10:30
Beijing Ballroom

Kamal Al-Hddad
École de Technologie Supérieure, Montréal, Québec, Canada
TITLE: TBD

Abstract: TBD

Kamal Al-Haddad is an international leader in the advancement of power electronics technology and its practical applications in traction, power utilities, renewable energy, smart micro/nano grids, lighting and telecommunications industry. He has natural ability to understand practical problems, provide innovative solutions for complex problems and apply them to practical applications. Dr. Al-Haddad has published over 100 journal and 500 conference papers reporting the scientific advances in the field. He has shown the technical leadership and has the credit of applying some of the published and classified research in industry in the design and development power electronic converters. He has supervised and guided over 100 graduate students, post-doctoral fellows, and power electronics engineers in academic and industrial research. He transferred 23 technologies to Canadian and international industry and published 2 books. He is the first Canadian to get elected as 2016-2017 president of the prestigious IEEE Industrial Electronics Society. Since 2000, he holds Canada senior research chair in Electric Energy Conversion and Power Electronics and is currently a professor at l'École de Technologie Supérieure.

Dr. Kamal Al-Haddad has gained extensive experience in designing and developing advanced energy conversion systems, including high efficiency, soft switching converters and high frequency power supplies for telecommunications, induction heating for manufacturing facilities, and other various industrial applications. As Canada Research Chair in Electric Energy Conversion - Power Electronics, Dr. Al-Haddad will focus on three key sectors: energy efficiency and electric power quality in electrical distribution networks; power supply sources for telecommunications systems; and electric traction systems for passenger transport.

Keynote Speech 3

Aug. 18, 10:50-11:30
Beijing Ballroom

Huijun Gao
Harbin Institute of Technology, China
Intelligent Micromanipulation for Organoid Regeneration

Abstract: Organoids are clusters of cells grown in vitro that maintain the structure and function of human tissues and organs. They have broad applications in the field of biomedicine and are a focus of international cutting-edge research. There are, however, several fundamental limits for standardized manufacturing of organoids: the complex mechanism of organoid regeneration, the challenging organoid growth control, and the high-precision cell manipulation. In this report, we introduce the micromanipulation methods, systems, and applications for organoid regeneration, and we focus on the major concepts and results in modeling, control, and manipulation for such multicellular systems. We also present an intelligent micromanipulation system for standardized manufacturing of organoids, which promotes the important application of organoids in pathological research, drug development, personalized diagnosis and treatment, and other fields of biomedicine.

Prof. Huijun Gao (Fellow, IEEE) received the Ph.D. degree in control science and engineering from the Harbin Institute of Technology, Harbin, China, in 2005. From 2005 to 2007, he carried out his post-doctoral research at the University of Alberta, Edmonton, AB, Canada. Since 2004, he has been with the Harbin Institute of Technology, where he is currently a Chair Professor and the Director of the Research Institute of Intelligent Control and Systems. His research interests include intelligent and robust control, robotics, mechatronics, and their engineering applications. Prof. Gao is a Member of the Academia Europaea. He serves/served as the Editor-in-Chief of the IEEE/ASME Transactions on Mechatronics, the Co-Editor-in-Chief of the IEEE Transactions on Industrial Electronics, and an Associate Editor of the Automatica, the IEEE Transactions on Cybernetics, and the IEEE Transactions on Industrial Informatics. He is the Vice President of the IEEE Industrial Electronics Society, and a Distinguished Lecturer of the IEEE Systems, Man and Cybernetics Society. He is the recipient of IEEE Norbert Wiener Award and IEEE Dr.-Ing. Eugene Mittelmann Achievement Award. He has been an ESI Highly Cited Researcher since 2014.

Keynote Speech 4

Aug. 18, 11:30-12:10
Beijing Ballroom
Bhushan Gopaluni
University of British Columbia, Canada
Stable and Sample Efficient Reinforcement Learning

Abstract: Reinforcement Learning (RL) is widely recognized for its capabilities in control and optimization. Despite its potential, industrial adoption necessitates guarantees of stability and sample efficiency. We present a modular approach to designing inherently stable deep reinforcement learning controllers for linear systems. Our approach leverages the Yula-Kucera parametrization of all stable controllers in conjunction with a purely data-based realization of the system model. This approach retains the "model-free" nature of RL but guarantees closed-loop stability through the learning episodes. We also present an extension of RL with meta-learning to improve sample efficiency. We illustrate these algorithms through experiments on a pilot-scale plant and comparison with off-the-shelf industrial controllers.

Bhushan Gopaluni is a professor in the Department of Chemical and Biological Engineering and a Vice-Provost & Associate Vice-President at the University of British Columbia. He was previously an Associate Dean in the Faculty of Applied Science and an Associate Head in the Department of Chemical & Biological Engineering. He is also an associate faculty in the Institute of Applied Mathematics, the Institute for Computing, Information and Cognitive Systems, Pulp and Paper Center and the Clean Energy Research Center. He was the Elizabeth and Leslie Gould Teaching Professor from 2014 to 2017. He is currently an associate editor for the Journal of Process Control and was previously an associate editor for The Journal of Franklin Institute and Results in Control and Optimization.

Bhushan received a Ph.D. from the University of Alberta in 2003 and a Bachelor of Technology from the Indian Institute of Technology, Madras, in 1997, both in the field of chemical engineering. From 2003 to 2005, he worked as an engineering consultant at Matrikon Inc. (now Honeywell Process Solutions), during which he designed and commissioned multivariable controllers in British Columbia's forest bio-products industry and implemented numerous controller performance monitoring projects in the Oil & Gas and other chemical and pharmaceutical industries. He is the recipient of the Killam Teaching Prize and the Dean's Service Medal from the University of British Columbia and the D. G. Fisher Award in Process Control from the Canadian Society for Chemical Engineers. He is a Fellow of the Canadian Academy of Engineering.

Keynote Speech 5

Aug. 19, 8:40-9:20
Beijing Ballroom

Makoto Iwasaki
Nagoya Institute of Technology, Japan
Practical Motion Controller Design for Mechatronic Systems Global Considering Environmental Issues

Abstract: "Motion Control" is one of practical academic disciplines on the basis of control theories, and has been extensively applied to actual "Mechatronic Systems" in various industrial fields. For example, fast-response and high-precision motion control should be indispensable in a wide variety of high-performance mechatronic systems including micro and/or nano scale motion, such as data storage devices, machine tools, manufacturing tools for electronics components, and industrial robots, from the standpoints of high productivity, high quality of products, and total cost reduction. In those applications, the required specifications in the motion performance, e.g. response/settling time, trajectory/settling accuracy, etc., should be sufficiently achieved, in addition to the robust/adaptive capabilities against disturbances, uncertainties, and variations in mechanisms.

Recent technological trends, on the other hand, are broadening the motion control applications to effectively present the countermeasures of the industrial high performances as well as the global environmental issues against, such as, natural disasters, global warming, SDGs, etc. The keynote, therefore, presents how the motion control can be applied to a wide variety of mechatronic systems to achieve the required performance, especially considering practical solution viewpoints of the global environmental issues. Examples of the R/D activities for the actual approaches, including the required performance as well as promising control techniques, can be presented to understand the motion controller design, by giving practical cases of hydraulic actuator driven earthquake simulators and Galvano-scanner driven bottle laser marking systems.

Makoto Iwasaki received the B.S., M.S., and Dr. Eng. degrees in electrical and computer engineering from Nagoya Institute of Technology, Nagoya, Japan, in 1986, 1988, and 1991, respectively. He is currently a Professor at the Department of Electrical and Mechanical Engineering, Nagoya Institute of Technology.

As professional contributions of the IEEE Industrial Electronics Society, he has participated in various organizing services, such as, a Chair of IES Fellow Evaluation Committee in 2022 and 2023, a Co-Editors-in-Chief for IEEE Transactions on Industrial Electronics from 2016 to 2022, a Vice President for Planning and Development in term of 2018 to 2021, etc. He is IEEE fellow

class 2015 for "contributions to fast and precise positioning in motion controller design".

He has received many academic, foundation, and government awards, like the Best Paper and Technical Awards of IEE Japan, the Nagamori Award, the Ichimura Prize, and the Commendation for Science and Technology by the Japanese Minister of Education, respectively. He is also a fellow of IEE Japan, and a member of Science Council of Japan.

His current research interests are the applications of control theories to linear/nonlinear modeling and precision positioning, through various collaborative research activities with industries.

Keynote Speech 6

Aug. 19, 9:20-10:00
Beijing Ballroom

Youmin Zhang
Concordia University, Canada
Challenges and New Developments on Safety & Security of Cyber-Physical Systems with Applications to Autonomous Systems

Abstract: Although the concepts on Fault Detection and Diagnosis (FDD) and Fault-Tolerant Control (FTC) have been progressively and extensively investigated worldwide since the 1970s and 1980s, respectively, the recent catastrophic crashes of two Boeing 737 MAX8 airplanes in 2019 have again highlighted the necessity and urgency for FDD and FTC research & development and their industrial applications. On the other hand, Smart Grids (SGs, including wind, solar, hydro, and hydrogen energies etc.) and Unmanned Systems (USs, including Unmanned Aerial Vehicles (UAVs), Unmanned Ground Vehicles (UGVs), Autonomous/Driverless Vehicles (AVs), Unmanned Surface Vehicles (USVs), and Unmanned Underwater Vehicles (UUVs), etc.) are gaining more and more attention and rapid development during the last a few years due to their relatively easy and cost-effective uses in various application tasks directly linking to our daily life for cleaner energy, better mobility, and sustainable development while fighting with climate change and global warming issues. The new advancements of these Autonomous Systems (ASs) are benefited significantly from new technical advances in materials, electronics, electrification, communication, computation, control, actuators, sensors, networks and new/smart designs linked to the rapid development under the framework of Cyber-Physical Systems (CPSs) and widely spread Artificial Intelligence (AI) and Deep Neural Network (DNN) learning technologies. Due to a higher level of size and complexity in these systems, in particular the added technical challenges due to the involvement of more electronic devices with both hardware and software and with large-scale and distributed networked systems, artificial cyber-attacks through communication networks, along with physical faults, could occur during systems operation, which will all lead to physical damages of the system and thus critical issues on safety and security (in addition to the regular system requests of stability and performance) of the desired/planned operations of the above-mentioned smart grids and autonomous/unmanned systems. In this talk, brief overall view on the challenges and latest developments towards smarter, safer, more reliable and more resilient autonomous/unmanned systems and renewable energy systems in terms of safe and secure controls of SGs with integration of renewable energies and USs integrating with Remote Sensing (RS) techniques for applications to forest and environment monitoring and fires/damages/risks detection will be presented first, then some of new developments and current research works being carried out at our group will be introduced as the second part of the presentation. New developments on

autonomous control, FDD, FTC, and Fault/Attack-Tolerant Cooperative Control (FTCC) techniques towards autonomous, safe and secure operations and applications of autonomous SGs and USs towards the forest fire and smart cities monitoring and detection tasks in the presence of physical-faults/damages and cyber-attacks will be presented.

Dr. Youmin Zhang (IEEE Fellow) is currently a Professor at the Department of Mechanical, Industrial and Aerospace Engineering and the Concordia Institute of Aerospace Design and Innovation (CIADI) at Concordia University, Canada (on Sabbatical Leave). Dr. Zhang received his BSc, MSc, and PhD degrees in Automatic Control Department of Northwestern Polytechnical University, Xi'an, China, in 1983, 1986, and 1995, respectively. His main research interests and experiences are in the areas of condition monitoring, physical fault/cyber-attack detection and diagnosis, and fault-tolerant and cyber-resilient control; autonomous guidance, navigation and control of unmanned aerial/space/ground/marine vehicles with applications to forest fires monitoring, detection, and suppression by combining with remote sensing techniques; advanced signal processing techniques for diagnosis, prognosis, fault-tolerant and health management of safety-critical systems with application to renewable energy systems and smart grids, and smart cities under the framework of cyber-physical systems. He has published 10 books, over 600 journals and conference papers with high citations. He is a Fellow of IEEE and Canadian Society of Mechanical Engineering (CSME), President of International Society of Intelligent Unmanned Systems (ISIUS, 2019-2022). He has been an (Deputy) Editor-in-Chief, (Advisory) Editorial Board Member, Associate Editor of more than 20 journals. He has served as (Honorary) General Chair, Program Chair of several autonomous/unmanned systems, renewable energies, and smart cities relevant conferences. He has been ranked #1 worldwide on "Aircraft systems" and "Fault tolerance" (Lifetime); #1 in Canada and #6 worldwide on "Unmanned aerial vehicle" (Lifetime) in the recent ranking at ScholarGPS™ by 2024 Meta Analytics LLC.

Keynote Speech 7

Aug. 19, 10:30-11:10

Beijing Ballroom

Jinjun Shan

York University, Canada

Adaptive Decision-Making for Autonomous Driving Vehicles

Abstract: Decision-making is crucial for safe and efficient driving in autonomous driving vehicles (ADVs). However, ADVs face significant challenges in coexisting with human road users, making fast and optimal driving decisions, and operating in unknown traffic environments with only incomplete information. Unsignalized intersection and lane-changing scenarios are particularly representative of such challenges, which involves complex dynamic interactions. ADVs need to assess and predict the driving preferences of nearby vehicles to optimize and adaptively adjust their own driving policies while considering uncertainties arising from incomplete observations. In this talk, recent developments on adaptive decision-making based on game-theory and learning-based methods will be presented.
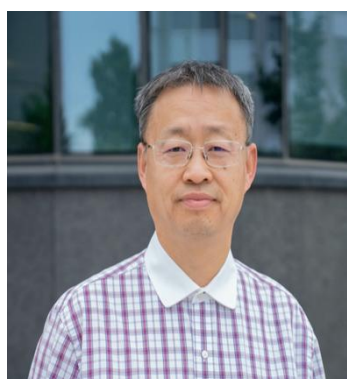
Prof. Jinjun Shan is an internationally recognized expert in the areas of dynamics, control and navigation. He is a Full Professor of Space Engineering at the Department of Earth and Space Science and Engineering, York University. Prof. Shan received his Ph.D. degree from Harbin Institute of Technology, China, in 2002. His research progress is demonstrated through over 200 peer-reviewed journal and conference publications and 2 issued patents. Prof. Shan's accomplishments in research and engineering education have seen him recognized with prestigious recognitions such as the Fellow of Canadian Academy of Engineering (CAE), the Fellow of Engineering Institute of Canada (EIC), the Fellow of American Astronautical Society (AAS), and a member of European Academy of Sciences and Arts. He serves the profession as the Associate Editor for several field-leading journals including IEEE Transactions on Industrial Electronics, IEEE/ASME Transactions on Mechatronics, and the Journal of Franklin Institute, as well as numerous conference chairs. He is the founding director of Spacecraft Dynamics Control and Navigation Laboratory (SDCNLab) at York University.

Keynote Speech 8

Aug. 19, 11:10-11:50
Beijing Ballroom
Shihua Li
Southeast University, China
Recent Advances on Disturbance Rejection Control for Mechatronic Systems

Abstract: For mechatronic systems, nonlinearities (frictions, backlash, saturation, etc.), complex internal dynamics, time-varying parameters, external disturbances and complex work tasks make control design a very challenging work. Compared with high gain control and integral control methods, disturbance estimation based control provides a different way to handle disturbance. Disturbance estimation based robust control method can effectively improve the disturbance rejection ability and ensure the robustness of closed-loop system. Some new research developments and results on this topic will be introduced. Specially we will discuss on various advanced modeling, analysis and disturbance rejection control techniques for mechatronic control systems with considerations of time delay, constraint safety. Considering the characteristics of mechatronic control system, several kinds of composite control design schemes based on disturbance estimation and compensation are presented with experimental or application verification results.

Shihua Li received his bachelor, master, Ph.D. degrees all in Automatic Control from Southeast University, Nanjing, China in 1995, 1998 and 2001, respectively. Since 2001, he has been with School of Automation, Southeast University, where he is a Chief Professor, Jiangsu Specially Appointed Professor. He is the chairman of IEEE IES Nanjing Chapter, Fellow of IEEE, IET, AAIA and CAA, IEEE Distinguished Lecturer. He is also the Director General of Jiangsu Association of Automation. His main research interests include modeling and nonlinear control theory with applications to mechatronic systems. He has published 3 monographs, over 300 international journal and conference papers with 31000+ citations (Google Scholar). He is one of Clarivate Analytics Highly Cited Researchers all over the world in 2017-2023. He is a winner of the 6th Nagamori Award in 2020.

10. Industrial Forum

Session 1: Industrial Electronics in Robotics & Vehicles

13:30-14:30, Sunday, Aug. 18, Beijing Ballroom

Chair(s):   **Dr. Zhibo Pang**
ABB Corporate Research & KTH Sweden

Speakers:

13:30-13:50   Smart Elderly Care Solution with 'Robotics + Cloud'
Dr. Zhongxia Xiong
Beijing Robint Technology Co. Ltd.

13:50-14:10   The Importance of Rosenberg In-Vehicle High-Speed Link
for Intelligent and Connected Vehicles
Mr. Frank Ding
Vice President, Rosenberger Asia Pacific Electronics
Company, Ltd.

14:10-14:30   High-Safety Intelligent Charging Solutions for Electric
Vehicles in All Scenarios
Ms. Shengran Xiao
Director, Beijing Automotive Research Institute Co., Ltd.

Session 2: Industrial Electronics in Mining and Marine Industries

14:30-15:30, Sunday, Aug. 18, Beijing Ballroom

Chair(s):   **Dr. Yebin Wang**
Mitsubishi Electric Research Labs

Speakers:

14:30-14:50   Open-Pit Mining Autonomous Haulage System
Implementation in China
Mr. Haijie Wu
Vice President, The Tage Idriver Company

14:50-15:10   The Development and Application Practice of the Largest
Seabed Cable and Pipeline Burying Tractor in Asia
Mr. Cheng Huang
Vice President, Sealien Robotics Co. Ltd.

15:10-15:30   A Low-Code Approach for Industrial Automation and
Information
Mr. Jinxian Liang
CEO, Shenzhen Cynovan Technologies Co. Ltd.

11. Tutorials

IEEE INDIN 2024 will host four tutorials during the conference, addressing 1) Machine Learning and Distributed Optimization for Cyber-Physical Energy Systems, 2) Advances in Control and Optimization for Disturbance/uncertainty Rejection with Applications to Industrial Sectors, 3) Digital Twin for Predictive Maintenance, and 4) Functional verification of Cyber Physical Systems: From Theory to Practices. Tutorials in this conference can provide an opportunity for attendees to learn about a specific topic or technology in a structured and focused manner. They can help to supplement the knowledge gained from attending talks and sessions, and provide attendees with a deeper understanding of a particular area.

Tutorial 1

Aug 17, 14:30-17:30
Huashan A
Machine Learning and Distributed Optimization for Cyber-Physical Energy Systems

Presenters:

- **Yan Zhang** (University of Oslo)
- **Yushuai Li** (Aalborg University)

Brief description:

As increasing integration of information and communication technology (ICT) and modern energy systems, the concept of cyber-physical energy systems (CPESs) is presented. By using advanced ICT and energy generation and consumption technologies, CPESs are capable of enhancing system reliability, improving operation security, and reducing failure risk, etc. With the development of diversified energy network architecture, digitalization infrastructure, and e-mobility, there are many unprecedented challenges for smart modelling, operation and control in CPESs.

In this tutorial, we will mainly focus on state-of-the-art machine learning and distributed optimization approaches with application in CPESs. We first will introduce the new concept, features, and challenges of CPESs. Then, we will present several kinds of advanced machine learning methods to tackle the challenges in the aspects of energy management, frequency control, and load monitoring. Next, we will present several kinds of distributed optimization methods to achieve peer-to-peer energy trading and sharing in different physical and communication environments. Finally, we will conclude and point out related open issues.

Tutorial 2

Aug 17, 14:30-17:30

Huashan B

Advances in Control and Optimization for Disturbance/uncertainty Rejection with Applications to Industrial Sectors

Presenters:

■ **Dapeng Tian** (Changchun Institute of Optics, Fine Mechanics and Physics, Chinese academy of sciences)

■ **Jinhui Zhang** (Beijing Institute of Technology)

■ **Jinya Su** (Southeast University)

■ **Wenchao Xue** (Academy of Mathematics and Systems Science, Chinese Academy of Sciences)

■ **Zhiliang Zhao** (North University of China)

Brief description:

Disturbance/uncertainty rejection has increasingly become the focal point of control design in many industrial sectors, including power and energy, robotics, motion, and rocess control. The idea of disturbance estimation and negation has been realized by many effective methods including active disturbance rejection control (ADRC), disturbance observer-based control (DOBC), equivalent-input disturbance approach (EIDA), composite hierarchical anti-disturbance control (CHADC), to name a few. These methods, developed in academia, have been successfully applied in industry, especially by the industry leaders such as Texas Instruments, FreeScale, Danfoss, etc. To achieve stronger capability and performance of disturbance / uncertainty rejection control for intelligent autonomous systems, optimization and learning methods are gradually attracting increasing attention from researchers.

This tutorial is launched to introduce the key idea and basic principles of disturbance rejection control. Furthermore, the solutions of disturbance rejection, overlap many fields of research such as electromechanical systems, robotic systems, precision motion control systems, and many other hot issues, will be presented. Moreover, the tutorial will show some advances in disturbance / uncertainty rejection by data-driven mechanisms and exploiting the information and models. The tutorial provides and discusses the new generation of disturbance rejection control technologies being formulated. This tutorial will provide an opportunity to enhance understanding and insights for these disturbance rejection methods and offer practitioners a roadmap of relevant academic and practical studies.

Dapeng Tian Graduated eceived B.S. degree from Beijing Institute of Technology and Ph.D. from Beihang University. He is now a professor of Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Science He is the recipient of the National Excellent Youth Fund, leader of the Chinese Academy of Sciences' stable support for basic research youth team, and project leader of the National Key Research and Development Program for Young Scientists. He is also an outstanding member of the Chinese Academy of Sciences Youth Innovation Promotion Association. Dr Tian has received awards such as the National Science and Technology Progress First Prize.

Jinhui Zhang received the Ph.D. degree in Control Science and Engineering from Beijing Institute of Technology, Beijing, China, in 2011. He was an Associate Professor in the Beijing University of Chemical Technology, Beijing, from March 2011 to March 2016, a Professor in the School of electrical and automation engineering, Tianjin University, Tianjin, from April 2016 to September 2016. He joined Beijing Institute of Technology in October 2016, where he is currently a Professor. His research interests include networked control systems and composite disturbance rejection control.

Jinya Su received his Bachelor and Ph.D. degrees in Shandong University (Weihai), China and Loughborough University, U.K. in 2011 and 2016, respectively. He is currently a Professor at Southeast University, China, and an Honorary Senior Lecturer at University of Essex, U.K., and was a Senior Lecturer at University of Aberdeen, U.K. (Top 200 world university). He was also among the World's Top 2% Scientists 2023 by Stanford University. His research interests mainly include AI empowered autonomous systems: perception and control under uncertainties.

Wenchao Xue received B.S. degree in applied mathematics from Nankai University, in 2007, and Ph.D. degree in control theory from the Academy of Mathematics and Systems Science (AMSS), Chinese Academy of Sciences (CAS) in 2012. He is now a professor of AMSS, CAS. His research interests include active disturbance rejection control, nonlinear uncertain system control and nonlinear uncertain system filtering.

Zhiliang Zhao received the Ph.D. degree in 2012 from the University of Science and Technology. He visited New York University from August 2016 to August 2017, and the State Key Laboratory of Synthetical Automation for Process Industries, Northeast University, China, from March 2018 to March 2019. He is currently a professor and dean at the School of Electronics and Control Engineering, the North University of China. His research interests include nonlinear systems and control, and active disturbance rejection control. He was awarded the Second Prize in Science and Technology of the Ministry of Education, and the Second Prize in Science and Technology of CAA.

Tutorial 3

Aug 17, 14:30-15:30

Hengshan A

Digital Twin for Predictive Maintenance

Presenters:

- ■ **Zheng Liu** (The University of British Columbia (Okanagan Campus))

Brief description:

The industry is migrating from reactive to predictive maintenance to increase operational availability and efficiency. An exciting chance to facilitate this transformation is coming with the 4th industrial revolution enabled by new information and communication technology (ICT) and data-intensive methodologies. The digital twin is a disruptive technology that creates a living model of industrial assets. The digital twin living model will continually adapt to changes in the environment or operations using real-time sensory data and forecast the future of the physical target. A digital twin can be used to proactively identify potential issues with its real physical counterpart. It allows the prediction of the remaining useful life of the physical twin by leveraging a combination of physics-based models and data-driven analytics. The digital twin ecosystem comprises sensor and measurement technologies, industrial Internet of Things, simulation and modeling, machine learning, artificial intelligence, and data/information fusion.

The tutorial will address a series of forward-looking topics crucial for harnessing the full potential of digital twin technology in predictive maintenance. These topics include an introduction to digital twins and their role in the 4th industrial revolution, the architectural and operational principles underlying digital twins, and the integration of sensor and measurement technologies with industrial Internet of Things (IoT) frameworks. A significant focus will be on the methodologies for simulating and modeling industrial assets, alongside the application of machine learning and artificial intelligence (AI) for data driven analytics and prediction. Additionally, the tutorial will delve into data/information fusion techniques that enhance the accuracy and reliability of digital twins. The emphasis on these subjects is highly timely, given the rapid evolution of ICT and the pressing need for industries to improve efficiency, reduce downtime, and anticipate maintenance needs to remain competitive. By exploring these cutting-edge technologies and methodologies, the tutorial will equip participants with the knowledge to navigate the challenges and seize the opportunities presented by digital twin technology in the context of predictive maintenance and beyond.

Zheng Liu (S'99-M'02-SM'06) received a Doctorate in Engineering (measurement and evaluation) from Kyoto University, Japan, in 2000 and a Ph.D. degree (electrical engineering) from the University of Ottawa, Canada, in 2007. From 2000 to 2001, he was a Research Fellow at the Nanyang Technological University, Singapore. Dr. Liu then joined the National Research Council of Canada (Ottawa, Ontario) as a Governmental Laboratory Visiting Fellow nominated by NSERC in 2001. Since 2002, he has become a Research Officer associated with two research institutes of NRC (Aerospace & Construction). From 2012 to 2015, Dr. Liu worked as a Full Professor at Toyota Technological Institute, Nagoya, Japan. He is now with the Faculty of Applied Science at the University of British Columbia. His research interests include predictive maintenance, data/information fusion, computer/machine vision, machine learning, smart sensor and industrial IoT, and non-destructive inspection and evaluation. Dr. Liu is a fellow of SPIE and a senior member of IEEE. He holds a Professional Engineer license in both British Columbia and Ontario. Dr. Liu serves on the editorial boards for journals including IEEE Transactions on Emerging Topics in Computational Intelligence, IEEE Transactions on AgriFood Electronics, Information Fusion, Machine Vision and Applications, and IET/CAAI Transactions on Intelligence Technology.

Tutorial 4

Aug 17, 14:30-18:30
Online
Functional Verification of Cyber Physical Systems: From Theory to Practices

Presenters:

■ **Nilotpal Chakraborty** (Indian Institute of Information Technology Guwahati)

Brief description:

Cyber-Physical System (CPS) integrates digital or cyber components with physical objects (e.g. robotic machines, autonomous vehicles) and data with various capabilities of communication, data generation, data processing, computation, decision making, and action. These systems are increasingly pervading their ways to all parts of our lives where applications range from agriculture and healthcare to energy, manufacturing and social networks. Advances in CPS will enable new capabilities and improved adaptability, scalability, and usability that will far exceed those current embedded systems. Therefore, there is a need to create an integrated ecosystem for convergence among all stakeholders towards CPS technology development and practical implementations. This tutorial is intended to cover primarily the functionalities of and analysis of CPS. In particular, we will cover the safetyness and liveness propertiesof CPS, which ensure that the system behaves correctly and as per the requirements of the design. For example, in a self-driving car, a safety property would be that the car does not collide with obstacles or pedestrians. On the other hand, Liveness property ensures that the car continues to make progress towards its intended goal, which is reaching the destination.

Dr. Nilotpal Chakraborty: Currently working as an Assistant Professor in Computer Science and Engineering at the Indian Institute of Information Technology Guwahati. He has obtained his PhD in Computer Science and Engineering from the Indian Institute of Technology Patna in 2019. He has worked as a Postdoctoral Researcher at Department of Computer Science, Aalborg University, Denmark, and at EMAX Group, Belgium, as an IT Solution and Innovation Expert. His research interests include Scheduling and Optimization in smart grid and electric vehicles, AI and Blockchain for Cyber Physical Systems.

12. Session Program

Saturday, Aug 17, 2024

Tutorial 01: Machine Learning and Distributed Optimization for Cyber-Physical Energy Systems
Time: 14:30-17:30
Place: Huashan A

Organizers:

Yan Zhang	Professor, University of Oslo
Yushuai Li	Assistant Professor, Aalborg University

Tutorial 02: Advances in Control and Optimization for Disturbance/ Uncertainty Rejection with Applications to Industrial Sectors
Time: 14:30-17:30
Place: Huashan B

Organizers:

Dapeng Tian	Professor, Changchun Institute of Optics, Fine Mechanics and Physics, Chinese academy of sciences
Jinhui Zhang	Professor, Beijing Institute of Technology
Jinya Su	Professor, Southeast University
Wenchao Xue	Professor, Academy of Mathematics and Systems Science, Chinese Academy of Sciences
Zhiliang Zhao	Professor, North University of China

Tutorial 03: Digital Twin for Predictive Maintenance
Time: 14:30-15:30
Place: Hengshan A

Organizers:

Zheng Liu	Professor, The University of British Columbia (Okanagan Campus)

Tutorial 04: Functional Verification of Cyber Physical Systems: From Theory to Practices
Time: 14:30-18:30
Place: Online

Organizers:

Nilotpal Chakraborty	Assistant Professor, Indian Institute of Information Technology Guwahati, Nilotpal Chakraborty

Sunday, Aug 18, 2024

Keynote Speech 1: From Industrial Electronics to Industrial Informatics
Time: 9:10-9:50
Place: Beijing Ballroom

Okyay Kaynak   Bogazici University

Keynote Speech 2: TBD
Time: 9:50-10:30
Place: Beijing Ballroom

Kamal Al-Haddad   École de Technologie Supérieure

Keynote Speech 3: Intelligent Micromanipulation for Organoid Regeneration
Time: 10:50-11:30
Place: Beijing Ballroom

Huijun Gao   Harbin Institute of Technology

Keynote Speech 4: Stable and Sample Efficient Reinforcement Learning
Time: 11:30-12:10
Place: Beijing Ballroom

Bhushan Gopaluni   University of British Columbia

Industry Forum 1: Industrial Electronics in Robotics & Vehicles
Time: 13:30-14:30
Place: Beijing Ballroom

Chair: Dr. Zhibo Pang, ABB Corporate Research & KTH Sweden

13:30-13:50   **Talk 1**
Smart Elderly Care Solution with 'Robotics + Cloud'
Mr. Zhongxia Xiong   CTO, Beijing Robint Technology Co., Ltd.

13:50-14:10   **Talk 2**
The Importance of Rosenberg In-Vehicle High-Speed Link for Intelligent and Connected Vehicles
Mr. Frank Ding   Vice President, Rosenberger Asia Pacific
                                Electronics Company, Ltd.

14:10-14:30   **Talk 3**

High-Safety Intelligent Charging Solutions for Electric Vehicles in All Scenarios
Ms. Shengran Xiao   Director, Beijing Automotive Research
                                     Institute Co., Ltd.

Industry Forum 2: Industrial Electronics in Mining and Marine Industries
Time: 14:30-15:30
Place: Beijing Ballroom

Chair: Dr. Yebin Wang, Mitsubishi Electric Research Labs

14:30-14:50   **Talk 1**

Open-Pit Mining Autonomous Haulage System Implementation in China
Mr. Haijie Wu   Vice President, The Tage Idriver Company

14:50-15:10   **Talk 2**

The Development and Application Practice of the Largest Seabed Cable and
Pipeline Burying Tractor in Asia
Mr. Cheng Huang   Vice President, Sealien Robotics Co. Ltd.

15:10-15:30   **Talk 3**

A Low-Code Approach for Industrial Automation and Information
Mr. Jinxian Liang   General   Manager,   Shenzhen   Cynovan
                                     Technologies Co. Ltd.

Paper Session

SuC01: Advanced Monitoring and Control for Cyber-Physical Systems 01
Time: 16:00-18:00
Place: Huashan A

Chair:
Dong Zhao   Beihang University
Zi-Peng Wang   Beijing University of Technology

16:00-16:15   SuC01-1

An Informer Based Alarm Early Prediction Method over Consecutive Alarm Monitoring Periods

Wenbin Jiang   China University of Geosciences
Wenkai Hu   China University of Geosciences
Zhe Liu   SINOPEC-SK (Wuhan) Petrochemical Company Limited
Fei Wang   SINOPEC-SK (Wuhan) Petrochemical Company Limited

16:15-16:30   SuC01-2

Fault-Tolerant Event-Triggered Sampled-Data Control for Synchronization of Reaction-Diffusion Neural Networks

Feng-Liang Zhao   Shenzhen Campus of Sun Yat-Sen University
Zi-Peng Wang   Beijing University of Technology
Yue-Yang Li   University of Jinan

16:30-16:45   SuC01-3

Fuzzy C-means Clustering-Based Key Performance Indicator-Related Monitoring Scheme for Chillers

Huayun Han   Beijing University of Technology
Rongxiao Jia   Beijing University of Technology
Dong Zhao   Beihang University
Xuejin Gao   Beijing University of Technology

16:45-17:00   SuC01-4

Performance Analysis of the Double-layer Permanent Magnet Rotor Flux Adjustable PMC with Slotted Conductor Rotor

Hailiang Cai   University of Jinan
Yichen Li   Shandong University of Science and Technology
Mengmeng Tian   University of Jinan
Yueyang Li   University of Jinan
Pu Zhao   State grid Jinan Power Supply Company

17:00-17:15   **SuC01-5**

Design of Hydraulic Manipulator Controller Based on FPGA and DSP

Meishuang Li	Shandong University
Teng Chen	Shandong University
Guoteng Zhang	Shandong University
Xuewen Rong	Shandong University

17:15-17:30   **SuC01-6**

Bearing Fault Diagnosis Based on SDWPSO-FMD

Na Zhang	Chongqing Jiaotong University
Ling Zhao	Chongqing Jiaotong University
Wu Hangjun	Chongqing Jiaotong University
Wu Gang	Chongqing Jiaotong University

17:30-17:45   **SuC01-7**

Fault-Tolerant Control for Linear Diffusion Process with Mobile Actuators and Sensors

Kui Chen	Tiangong University
Xiao-Wei Zhang	Tiangong University
Jin-Liang Wang	Tiangong University

17:45-18:00   **SuC01-8**

Design and Implementation of Low Delay Multi-channel Synchronous Pulse Generator

Ziling Chen	Metrology Testing Center, China Academy of Engineering Physics
Yuanshou Hu	Metrology Testing Center, China Academy of Engineering Physics
Rui Hu	Metrology Testing Center, China Academy of Engineering Physics
Bin He	Metrology Testing Center, China Academy of Engineering Physics

SuC02: AI in Industrial Application 01
Time: 16:00-18:00
Place: Huashan B

Chair：

Hao Luo	Harbin Institute of Technology
Zehua Jia	Hainan University

16:00-16:15　　SuC02-1

Towards Practically Applicable Transfer Learning Methods for Remaining Useful Life Prediction of Bearings

Adam Lundström	Mid Sweden University
Mattias O'Nils	Mid Sweden University
Faisal Z. Qureshi	University of Ontario Institute of Technology

16:15-16:30　　SuC02-2

A Transformer-Based GAN for Bearing Fault Diagnosis under Limited Data Conditions

Xin Guo	University of Shanghai for Science and Technology
Fei Meng	University of Shanghai for Science and Technology

16:30-16:45　　SuC02-3

Enhancing Domain Generalization in Rotating Machinery Fault Diagnosis through Diffusion Model-Based Data Augmentation

Jinyuan Zhang	Nankai University
Boyuan Yang	Nankai University

16:45-17:00　　SuC02-4

Transient Stability Improvement of Grid-Tied Photovoltaics using Deep Reinforcement Learning

Gunawan Dewantoro	The University of Auckland
Akshya Swain	The University of Auckland
Nitish Patel	The University of Auckland

17:00-17:15　　SuC02-5

Reinforcement Learning Control-Based Inertia Emulation of Grid-Connected Photovoltaics

Gunawan Dewantoro	The University of Auckland
Akshya Swain	The University of Auckland
Nitish Patel	The University of Auckland
Faizal Hafiz	Universite Cote d'Azur

17:15-17:30   **SuC02-6**

Auxiliary Diagnosis of Knee-Joint Edema using a Multi-Dimensional Feature Extraction and Fusion Network

Hancheng Qin	Harbin Institute of Technology
Yuchen Jiang	Harbin Institute of Technology
Hao Luo	Harbin Institute of Technology
Yong Qin	The Second Affiliated Hospital of Harbin Medical University
Minglei Li	Harbin Institute of Technology
Pengfei Yan	Harbin Institute of Technology
Jiangqi Li	Harbin Institute of Technology

17:30-17:45   **SuC02-7**

The Estimation Method for Lithium Battery State of Health Based on BES-GPR

Ming Xu	Nanjing Tech University
Chao Jia	Nanjing Tech University
Fan Ping	Nanjing Tech University
Xiaodong Miao	Nanjing Tech University

17:45-18:00   **SuC02-8**

A Short-Term Industrial Load Forecasting Model based on VMD-FFEN-ITR

Yufan Wang	Shandong University
Tao Xu	Shandong University
Feng Gao	Shandong University
Hao Tian	Shandong University
Yusen Zhang	Shandong University

SuC03: AI in Industrial Application 02
Time: 16:00-18:00
Place: Hengshan A

Chair：

| Zeyang Yin | Central South University |
| Tobias Müller | FZI Research Center for Information Technology |

16:00-16:15   SuC03-1

Ontology-Supported AI Model and Dataset Management

Jan Novacek	FZI Research Center for Information Technology
Ali Ahari	FZI
Tobias Müller	FZI Research Center for Information Technology
Sebastian Reiter	FZI Forschungszentrum Informatik
Alexander Viehl	FZI Forschungszentrum Informatik
Oliver Bringmann	University of Tübingen

16:15-16:30   SuC03-2

Exploring LLM Support for Generating IEC 61131-3 Graphic Language Programs

| Yimin Zhang | University of Porto |
| Mario de Sousa | University of Porto |

16:30-16:45   SuC03-3

Multi-Grained and Cross-Modality Representation Based Image Compressing for Industrial Scene Understanding

Jingzheng Tu	China Academy of Aerospace Science and Innovation
Yan Yan	China Academy of Aerospace Science and Innovation
Ying Lu	China Academy of Aerospace Science and Innovation
Cailian Chen	Shanghai Jiaotong University
Shiru Zhou	China Academy of Aerospace Science and Innovation

16:45-17:00   SuC03-4

A Capacity Estimation Framework for Lithium-Ion Battery Integrating Data-Driven Model and Physical Knowledge

Lingchen Wang	Fudan University
Hongxin Xu	Fudan University
Tao Yang	Fudan University
Bo Hu	Fudan University

17:00-17:15   **SuC03-5**

Class-Aware Semi-Supervised Contrastive Learning with Pseudo-Label Guidance for Bearing Fault Diagnosis

Lei Wang	Nankai University
Boyuan Yang	Nanjing University

17:15-17:30   **SuC03-6**

Towards An Effective Tool Wear Monitoring System with An AI Model Management Platform

Jianwen Chen	National Tsing Hua University
Meng Shiun Tsai	National Taiwan University
Che Lun Hung	National Yang Ming Chiao Tung University

17:30-17:45   **SuC03-7**

PMSM System Identification by Knowledge-Informed Machine Learning

Yue Yu	Southeast University
Jiageng Tong	Southeast University
Jinhui Xia	Southeast University
Jinya Su	Southeast University
Shihua Li	Southeast University

17:45-18:00   **SuC03-8**

Concept of An Initial Requirements-Driven Factory Layout Planning and Synthetic Expert Verification for Industrial Simulation Based on LLM

Erik-Felix Tinsel	University of Stuttgart
Armin Lechler	University of Stuttgart
Oliver Riedel	University of Stuttgart
Alexander Verl	University of Stuttgart

SuC04: AI in Industrial Application 03
Time: 16:00-18:00
Place: Hengshan B

Chair:

Zhiyang Ju	Beijing Institute of Technology
Chi Chung Lee	Hong Kong Metropolitan University

16:00-16:15   SuC04-1

A Phased-Based Approach to Neuromorphic Audio Recognition

Shane Harrigan	Ulster University
Sonya Coleman	Ulster University
Dermot Kerr	Ulster University

16:15-16:30   SuC04-2

Intelligent Cargo Handling - A Dataset for Industrial Operation Scenarios

Juliana Veiga dos Santos	Center for Computational Sciences
Guilherme Silva	Center for Computational Sciences
Eduardo Borges	FURG
Paulo Drews-Jr	FURG
Silvia Botelho	FURG

16:30-16:45   SuC04-3

Positioning Stabilization with Reinforcement Learning for Multi-Step Robot Positioning Tasks in Nvidia Omniverse

Abishek Sunilkumar	Northwestern Polytechnical University
Fouad Bahrpeyma	Northwestern Polytechnical University
Dirk Reichelt	Northwestern Polytechnical University

16:45-17:00   SuC04-4

A Hybrid Network Based Disturbance Estimation Method for Stabilization Loop of Inertial Platform

Siqi Yang	Northwestern Polytechnical University
Huiping Li	Northwestern Polytechnical University
Zhaoxu Wang	Northwestern Polytechnical University

17:00-17:15   SuC04-5

Artificial Intelligence in Industry 4.0: A Review of Integration Challenges for Industrial Systems

Alexander Windmann	Helmut Schmidt University Hamburg
Philipp Wittenberg	Helmut Schmidt University Hamburg
Marvin Schieseck	Helmut-Schmidt-Universität/Universität der Bundeswehr Hamburg
Oliver Niggemann	Helmut Schmidt University Hamburg

17:15-17:30   **SuC04-6**

Multi-Stage Product Quality Prediction Based on CNN-BiGRU-Attention

Chen Yan	Sun Yat-sen University
Yifu Sun	Sun Yat-sen University
Xi Liu	Sun Yat-sen University

17:30-17:45   **SuC04-7**

Relevance Vector Machine for Code Smell Detection

Hanson Prihantoro Putro	Institut Teknologi Sepuluh Nopember
Umi Laili Yuhana	Institut Teknologi Sepuluh Nopember
Eko Mulyanto Yuniarno	Institut Teknologi Sepuluh Nopember
Mauridhi Hery Purnomo	Institut Teknologi Sepuluh Nopember

17:45-18:00   **SuC04-8**

Generating Assembly Instructions using Reinforcement Learning in Combination with Large Language Models

Niklas Widulle	Helmut Schmidt Universtät
Frederic Meyer	OWL University of Applied Sciences and Arts
Oliver Niggemann	Helmut-Schmidt-University Hamburg

SuC05: Applications of Advanced Control Technology in Mechatronic Systems
Time: 16:00-18:00
Place: Songshan A

Chair:
Yunfeng Hu   Jilin University
Yao Sun   Jilin University

16:00-16:15   **SuC05-1**
Path Tracking for Four-Wheel Steering and Four-Wheel Drive Autonomous Vehicles: Integration of Backstepping and Optimization Approaches
Nian Wang   Dongfeng Technology Center
Chunlai Zhao   Dongfeng Technology Center
Zeyang Zhang   Dongfeng Technology Center
Guoqing Zhang   Dongfeng Technology Center
Junfei Ma   Dongfeng Technology Center
Haoqi Hu   Tongji University
Lin Zhang   Tongji University

16:15-16:30   **SuC05-2**
A Novel Predefined-Time Neural Dynamics Model with Time-Base Generator for Nonlinear Equation Flows
Linju Li   Hunan Normal University
Lin Xiao   Hunan Normal University
Yingqiang Ning   Hunan Normal University

16:30-16:45   **SuC05-3**
Event-Triggered Model Predictive Control for An Autonomous Vehicle Based on Tight Constraints
Xiurui Lin   Zhejiang University of Technology
Hantuo Chen   Zhejiang University of Technology
Dongdong Qin   Zhejiang University of Technology
Andong Liu   Zhejiang University of Technology
Hongjie Ni   Zhejiang University of Technology
Ye Wang   Lishui University

16:45-17:00   **SuC05-4**
Recursive Subspace Least Squares Estimation for Data-Driven Model Predictive Control and Its Application to Aeroengines
Na Wang   Dalian University of Technology
Si-Xin Wen   Dalian University of Technology
Yuhu Wu   Dalian University of Technology

17:00-17:15   SuC05-5

Temporal Normalization Flow for Probabilistic Time Series Forecasting

Jiarui Ye	Guangdong University of Technology
Bo Zhao	Beijing Normal University
Derong Liu	Southern University of Science and Technology

17:15-17:30   SuC05-6

Design Process of a Small-Scaled Bladeless Vortex-induced Wind Turbine with Tunable Resonance Mechanism

Heeyun Kang	Handong Global University
Suseong Han	Handong Global University
Changmin Ahn	Handong Global University
Young-Keun Kim	Handong Global University

17:30-17:45   SuC05-7

An Eco-Cooling Mode-Switching Strategy for Automotive Air Conditioning System

Xinglong Yang	FAW Bestune Automotive Co.,Ltd
Ming Xu	FAW Bestune Automotive Co.,Ltd
Hang Ren	Jilin University
Ji Qi	FAW Bestune Automotive Co.,Ltd
Xiaohang Li	FAW Bestune Automotive Co.,Ltd
Xun Gong	Jilin University

17:45-18:00   SuC05-8

Effect of Human Heat on The Output Performance of Thermoelectric Generators with Phase Change Materials

Zhixiong Hou	Hebei University of Technology
Tingxiang Yan	Hebei University of Technology
Hengxuan Zhu	Hebei University of Technology
Jin Wang	Hebei University of Technology

SuC06: Digital Twins and Their Industrial Applications
Time: 16:00-18:00
Place: Songshan B

Chair:

Fang Fang	North China Electric Power University
Yuanye Chen	North China Electric Power University

16:00-16:15   SuC06-1

Construction of Manufacturing Workshop Monitoring System Based on Digital Twin

Huichen Pan	Jiangsu University of Science and Technology
Hui Ye	Jiangsu University of Science and Technology
Xiaofei Yang	Jiangsu University of Science and Technology
Tianxiang Hu	Jiangsu University of Science and Technology
Wei Liu	Jiangsu University of Science and Technology
Xu Wang	Jiangsu University of Science and Technology

16:15-16:30   SuC06-2

An Adaptive Scheduling Method for Infrastructure Construction Progress Based on Digital Twin

Haisheng Liang	State Grid Shanghai Municipal Electric Power Company
Yini Wang	State Grid Shanghai Municipal Electric Power Company
Chuxi Wei	North China Electric Power University
Songyuan Yu	North China Electric Power University
Fang Fang	North China Electric Power University

16:30-16:45   SuC06-3

Acoustic Feature Extraction of Wind Turbine Blades Based on Improved Mfcc-Gfcc

Ziyi Wang	North China Electric Power University
Yuanye Chen	North China Electric Power University
Hua Wang	China Huaneng Clean Energy Research Institute
Haichao Wang	Shaanxi Oceanx Technology Co., Ltd
Fang Fang	North China Electric Power University

16:45-17:00   SuC06-4

Digital Twins in Industrial Automation: A Closer Look on RFID Read/Write Components for Virtual Commissioning

Philippe Komma	Balluff GmbH
Merlin Vogelbruch	ISG Industrielle Steuerungstechnik GmbH
Markus Jung	Balluff GmbH

17:00-17:15   **SuC06-5**

What-if Scenario Testing through Power System Digital Twins

Zhiwei Shen	UNSW Sydney
Felipe Arrano-Vargas	UNSW Sydney
Georgios Konstantinou	UNSW Sydney

17:15-17:30   **SuC06-6**

Control Interval Reconstruction of Floating Wind Turbine Based on Response Characteristics

Jingfeng Zhou	North China Electric Power University
Ziqiu Song	North China Electric Power University
Fang Fang	North China Electric Power University

17:30-17:45   **SuC06-7**

Digital Twin for Remote Fault Detection of Heavy-Duty Machinery

Ricardo Pinto da Silva	Digital and Intelligent Industry Lab, SYSTEC, ARISE, FEUP
Luís Neto	FEUP
Gil Gonçalves	University of Porto, Faculty of Engineering
Frutuoso Mateus	Vicort
Rodrigo Pires	Vicort

17:45-18:00   **SuC06-8**

Cargo Motion Prediction Based on Its Dynamics using ROS

Marcos Rodrigues	Center for Computational Sciences
Manoela Almeida	Center for Computational Sciences
Gabriel de Souza	Center for Computational Sciences
Cedenir da Costa	Center for Computational Sciences
Juliana dos Santos	Center for Computational Sciences
Vitor Gervini	Center for Computational Sciences
Silvia Botelho	Center for Computational Sciences
Vinicius Oliveira	FURG

SuC07: Distributed and Intelligent Edge Computing (IEC) for Industrial IoT
Time: 16:00-18:00

Place: Taihangshan

Chair:

Mikael Gidlund	Mid Sweden University
Tao Zheng	Beijing Jiaotong University

16:00-16:15   SuC07-1

Distributed Predictive Maintenance through Edge Computing

Rakiba Rayhana	The University of British Columbia
Hongguang Yun	The University of British Columbia
Teng Wang	The University of British Columbia
Johnson Chen	The University of British Columbia
Yanshuo Fan	The University of British Columbia
Zheng Liu	The University of British Columbia
Wendy Gao	CRWN.ai

16:15-16:30   SuC07-2

Improving Information Freshness in Edge-Assisted Smart Grids: An AoI-Aware Routing Strategy for Neighborhood Area Networks

Hossam Farag	Aalborg University
Cedomir Stefanovic	Aalborg University
Mostafa Kotb	Universität Hamburg
Mikael Gidlund	Mid Sweden University

16:30-16:45   SuC07-3

Enhancing V2V Communication through Adaptive Clustering and Intelligent Routing Based on Vehicle Attributes and Behavior

Keyi Feng	Beijng Jiaotong University
Tao Zheng	Beijng Jiaotong University
Kyi Thar	Mid Sweden University
Mikael Gidlund	Mid Sweden University
Mohsen Guizani	Mohamed bin Zayed University of Artificial Intelligence

16:45-17:00   SuC07-4

Digital Twin-Empowered Contextual Bandit Learning-Based Matching for Peer Offloading of Delay-Sensitive Tasks in Dynamic Fog Networks

Hoa Tran-Dang	Kumoh national institute of Technology
Kim Dong-Seong	Kumoh national institute of Technology

17:00-17:15   **SuC07-5**

Enhancing Training Efficiency for Cloud-Edge Collaboration in the Industrial Internet of Things: A Transmission-Centric Approach

Jia Zhang	Beijing Jiaotong University
Tao Zheng	Beijing Jiaotong University
Binjie Lu	Beijing Jiaotong University
Huan Yin	Beijing Jiaotong University
Kyi Thar	Mid Sweden University
Mikael Gidlund	Mid Sweden University
Mohsen Guizani	Mohamed bin Zayed University of Artificial Intelligence

17:15-17:30   **SuC07-6**

Bringing Human Cognition to Machines: Introducing Cognitive Edge Devices for the Process Industry

Zohra Charania	Technische Universität Dresden
Lucas Vogt	Technische Universität Dresden
Anselm Klose	Technische Universität Dresden
Leon Urbas	Technische Universität Dresden

17:30-17:45   **SuC07-7**

Sample-and-Hold Based Security Control for CPSs with DoS Attakcs and Disturbances

Cheng Zhang	Yangzhou University
Enci Wang	Yangzhou University
Enze Zhang	Yangzhou University
Yi Yang	Yangzhou University

17:45-18:00   **SuC07-8**

Double Acceleration of Distributed Nesterov Gradient Descent Algorithms by Exploiting Momentum

Xin Yi	Wuhan University of Science and Technology
Jing-Wen Yi	Wuhan University of Science and Technology
Li Chai	Zhejiang University

Monday, Aug 19, 2024

Keynote Speech 5: Practical Motion Controller Design for Mechatronic Systems Considering Global Environmental Issues
Time: 8:40-9:20
Place: Beijing Ballroom

Makoto Iwasaki   Nagoya Institute of Technology

Keynote Speech 6: Challenges and New Developments on Safety & Security of Cyber-Physical Systems with Applications to Autonomous Systems
Time: 9:20-10:00
Place: Beijing Ballroom

Youmin Zhang   Concordia University

Keynote Speech 7: Adaptive Decision-Making for Autonomous Driving Vehicles
Time: 10:30-11:10
Place: Beijing Ballroom

Jinjun Shan   York University

Keynote Speech 8: Recent Advances on Disturbance Rejection Control for Mechatronic Systems
Time: 11:10-11:50
Place: Beijing Ballroom

Shihua Li   Southeast University

Paper Session

MoA01: Industry 4.0 in Agriculture
Time: 10:30-12:30
Place: Huashan A

Chair:

Lei Shu	Nanjing Agricultural University
	University of Lincoln
Yongliang Qiao	University of Adelaide

10:30-10:45　MoA01-1

A Multi-Feature Fusion Detection Network Based on An Orchard Complex Environment

Xiaoyao Yang	Qilu University of Technology (Shandong Academy of Sciences)
Wenyang Zhao	Qilu University of Technology (Shandong Academy of Sciences))
Yanqiang Li	Institute of Automation Qilu University of Technology (Shandong Academy of Sciences)

10:45-11:00　MoA01-2

Advancing Agricultural Decision-Making with A Multi-Dimensional Evaluation of Large Language Models for Sustainable Pest Management

Shanglong Yang	The University of Sheffield
Zhipeng Yuan	The University of Sheffield
Shunbao Li	The University of Sheffield
Ruoling Peng	The University of Sheffield
Kang Liu	The University of Sheffield
Po Yang	The University of Sheffield

11:00-11:15　MoA01-3

Throughput-Optimized LoRaWAN for Industry 4.0-Driven Smart Agriculture

Zhifu Zhang	City University of Hong Kong
Yucheng Liu	City University of Hong Kong
Gerhard Hancke	City University of Hong Kong
Mo Zhou	City University of Hong Kong

11:15-11:30   **MoA01-4**

Multi-Dimension Dynamic Convolution for Small Object Detection in Greenhouse with Improved Criterion

Lei Wang	University of Shanghai for Science and Technology
Fei Meng	University of Shanghai for Science and Technology

11:30-11:45   **MoA01-5**

Obstacle Avoidance Control for Static and Dynamic Obstacles on Intelligent Mobile Platforms in Greenhouses

Wang Kang	University of Shanghai for Science and Technology
Fei Meng	University of Shanghai for Science and Technology

11:45-12:00   **MoA01-6**

Brief Analysis of False Data Injection Attacks Based on Two Data Modalities in IoTs-based Solar Insecticidal Lamps

Qin Su	Nanjing Agricultural University
Lei Shu	Nanjing Agricultural University
Qingsong Zhao	Nanjing Agricultural University
Xing Yang	Anhui Science and Technology University
Zitian Jiang	Nanjing Agricultural University
Jiarui Fang	Nanjing Agricultural University
Huihsin Chin	Department of Information Technology Overseas Chinese University

12:00-12:15   **MoA01-7**

FarmSR: Super-Resolution in Precision Agriculture Field Production Scenes

Chang Meng	Nanjing Agriculture University
Lei Shu	Nanjing Agriculture University
Ru Han	Nanjing Agriculture University
Yifan Chen	Nanjing Agriculture University
Lanfang Yi	Nanjing Agriculture University
Der-Jiunn Deng	National Changhua University of Education

12:15-12:30   **MoA01-8**

Capacity Estimation for Retired Electric Vehicle Batteries in Agricultural Renewable Energy Systems

Chi Chung Lee	Hong Kong Metropolitan University
Panpan Hu	Hong Kong Metropolitan University

S. K. Lam   Hong Kong Metropolitan University
ChunYin LI   Hong Kong Metropolitan University

MoA02: Intelligent New Energy Vehicle Technology
Time: 10:30-12:30
Place: Huashan B

Chair:
Peng Dong   Beihang University
Yang Tian   Yanshan University
Junwei Zhao   Beihang University

10:30-10:45   MoA02-1
A Lightweight Multi Object Detection Algorithm for Complex Road Scenes Based on CMF-YOLO
Wenyang Zhao   Qilu University of Technology
                                   (Shandong Academy of Sciences)
Xiaoyao Yang   Qilu University of Technology
                                   (Shandong Academy of Sciences)
Xiao Ma   Qilu University of Technology
                                   (Shandong Academy of Sciences)
Yong Wang   Qilu University of Technology
                                   (Shandong Academy of Sciences)

10:45-11:00   MoA02-2
Muti-mode Ravigneaux Gearset-Based Powertrain and Optimization for Electric Trucks
Hanlong Zhang   Yanshan University
Yang Tian   Yanshan University

11:00-11:15   MoA02-3
Integration of MPC and ADRC for Anti-Jackknifing in Articulated Heavy Vehicles
He Ma   State Key Laboratory of Crane Technology
Yang Tian   State Key Laboratory of Crane Technology
Fanyu Meng   State Key Laboratory of Crane Technology

11:15-11:30   MoA02-4
Design, Modeling and Experimental Validation of Full-Vector-Control-by-Wire Skateboard Chassis
Quantong Li   Tsinghua University
Xiangyu Wang   Tsinghua University
Liang Li   Tsinghua University
Haoyu Lv   China Agricultural University
Zhaonan Li   Tsinghua University
Zhixian Fan   Zhongtong Bus Co., Ltd.

11:30-11:45   **MoA02-5**

Regenerative Torque Control Strategy for Low Adhesion Conditions in Distributed Drive Vehicles

Xu Yinggang	Tsinghua University
Li Liang	Tsinghua University
Hao Lv	China Agricultural University
Cheng Luhua	Tsinghua University
Zheng Zhu	Tsinghua University
Wang Xiangyu	Tsinghua University

11:45-12:00   **MoA02-6**

Integrated Control of Yaw and Roll Stability for Autonomous Vehicles Using Interval Type-2 Fuzzy Logic

Yigao Ning	Chang'an University
Xuan Zhao	Chang'an University
Jianyi Ning	China Academy of Transportation Sciences
Rui Liu	Chang'an University
Yanru Wang	Chang'an University

12:00-12:15   **MoA02-7**

Parameter Optimization and Energy Management for a Dual-Motor Powertrain in Battery Electric Heavy Trucks

Yusen Miao	Yanshan University
Yang Tian	Yanshan University
Yahui Zhang	Yanshan University
Lei Ma	Yanshan University

12:15-12:30   **MoA02-8**

Review on the Development Trends of Electric Drive Systems for Electric Vehicles

Shuhan Wang	Beihang University
Hanning Zhang	Beihang University
Junqing Li	Beihang University
Peishen Zhao	Beihang University
Xiangyang Xu	Beihang University
Peng Dong	Beihang University

MoA03: Key Techniques of the Operating Systems for the Intelligent Connected Vehicles
Time: 10:30-12:30
Place: Hengshan A

Chair:
Fan Zhou   Beihang University
Shichun Yang   Beihang University

10:30-10:45   **MoA03-1**
XvSomeIP: A High-Performance In-Vehicle Communication Middleware Based on XDP
Guoqing Yang   Zhejiang University
Hongming Zhong   Zhejiang University
Qiang Zhou   Zhejiang University
Pan Lv   Zhejiang University
Hong Li   Zhejiang University
Zhijie Pan   Zhejiang University

10:45-11:00   **MoA03-2**
Event-Triggered Mechanism-Based MPC for Path-Tracking Control of Four-Wheel Steering Vehicles
Xiangyu Zhang   Beihang University
Han Li   Beihang University
Guoyan Xu   Beihang University
Peng Chen   Beihang University
Qi Xia   Beihang University
Han Cai   Beihang University

11:00-11:15   **MoA03-3**
Prediction of Driving Departure of Mining Autonomous Transport Vehicles Based on GRU Network
Lecong Li   Beihang University
Guizhen Yu   Beihang University
Han Li   Beihang University
Qi Xia   Beihang University
Xiangyu Zhang   Beihang University
Han Cai   Beihang University

11:15-11:30   **MoA03-4**

Research on Task Scheduling Methods for Intelligent Connected Vehicles with End-to-End Delay Constraints

Yang Shichun	Beihang University
Wenlong Chen	Beihang Univerisity
Boao Zhang	Beihang University
Duan Qianlong	Beihang University
Bide Hao	Beihang University
Xiaoyu Yan	Beihang University

11:30-11:45   **MoA03-5**

A Review of Internet of Vehicle technology in Intelligent Connected Vehicle

Chen Fei	Beihang University
Bide Hao	Beihang University
Yang Shichun	Beihang University
Duan Qianlong	Beihang University
Wenlong Chen	Beihang University
Fan Zhou	Beihang University

11:45-12:00   **MoA03-6**

Design of a Communication Framework for Heterogeneous Multicore Systems in CAN Communication

Qianlong Duan	Beihang University
Shichun Yang	Beihang University
Bide Hao	Beihang University
Wenlong Chen	Beihang University
Shizhuang Li	Beihang University
Fan Zhou	Beihang University

12:00-12:15   **MoA03-7**

Real-Time Vehicle Operating System Analysis, Construction and Testing

Yang Shichun	Beihang University
Li Shizhuang	Beihang University
Bide Hao	Beihang University
Qianlong Duan	Beihang University
Wenlong Chen	Beihang University
Fan Zhou	Beihang University

12:15-12:30   **MoA03-8**

Task Scheduling Algorithms for Energy Optimization under Scheduling Duration and Reliability Constraints

Li Shizhuang	Beihang University
Bide Hao	Beihang University
Shichun Yang	Beihang University

Qianlong Duan   Beihang University

Wenlong Chen   Beihang University

Fan Zhou   Beihang University

MoA04: Real-Time and Networked Embedded Computing Industrial IoT Technologies and Applications

Time: 10:30-12:30
Place: Hengshan B
Chair:

Xinping Guan	Shanghai Jiao Tong University
Henglai Wei	Beihang University

10:30-10:45   MoA04-1

A Review of Fingerprint-Based LoRa Indoor Localization Techniques

Huajiang Ruan	Shaoxing University
Aminreza Karamoozian	Shaoxing University
Zhaoxi Fang	Shaoxing University

10:45-11:00   MoA04-2

A Timeslot Clustering-Based Hybrid Traffic Scheduling in Time-Sensitive Networking

Zhihao Yang	Shanghai Jiao Tong University
Shouliang Wang	Shanghai Jiao Tong University
Qimin Xu	Shanghai Jiao Tong University
Xin Li	Shanghai Jiao Tong University
Cailian Chen	Shanghai Jiao Tong University

11:00-11:15   MoA04-3

An Energy Efficient CSS in a CR-IoT Network with Interference Constraints

Md Sipon Miah	University Carlos III de Madrid
Mingbo Niu	Chang'an University
Ana Garcia Armada	University Carlos III de Madrid

11:15-11:30   MoA04-4

Energy Harvesting for Powering Distributed and Autonomous Airflow Controllers of a Smart Local Exhaust Ventilation System

Zheng Chew	University of Exeter
Rajender Humnabad	R&B Industrial
Roger Watson	R&B Industrial
Clive Bates	R&B Industrial

11:30-11:45   **MoA04-5**

Developing a Cloud-based Automated Internet of Things Framework for Industrial Applications using AWS

Vahid Saranirad	Ulster University
Kyle Madden	Ulster University
Dermot Kerr	Ulster University
Sonya Coleman	Ulster University
Justin Quinn	Ulster University

11:45-12:00   **MoA04-6**

An Autonomous Edge Box System Architecture for Industrial IoT Applications

Cheng Guo	University of Twente
Shun Yang	University of Twente
Sebastian Thiede	University of Twente

12:00-12:15   **MoA04-7**

Vision Based Deflection Angle Measurement of Flight Control Surfaces in Aircraft Testing

Jiaxin Xu	Shanghai Jiao Tong University
Cheng Ren	Shanghai Jiao Tong University
Cailian Chen	Shanghai Jiao Tong University
Yehan Ma	Shanghai Jiao Tong University
Xinping Guan	Shanghai Jiao Tong University

12:15-12:30   **MoA04-8**

Energy-Efficient LoRaWan Communication: Real-Time Applications in Aquaculture

Lucas Benedetti	FURG
Alberto Cabral	FURG
Diogo Guimarães	FURG
Ahmed Janati	Bioceanor
Bruna Guterres	FURG
Vinicius Oliveira	FURG
Aline Bezerra	FURG
Everson da Silva Flores	Federal University of Rio Grande - FURG
Silvia Botelho	FURG
Paulo Lilles Jorge Drews Junior	Federal University of Rio Grande
Nelson Duarte	FURG
Luis Poersch	FURG
Wilson Wasielesky	FURG
Marcelo Pas	FURG

MoA05: Recent Developments in Sliding Mode Control and Its Industrial Applications
Time: 10:30-12:30
Place: Songshan A

Chair:

Shihong Ding	Jiangsu University
Zhenghua Pan	Beijing Institute of Technology

10:30-10:45 MoA05-1

Dynamic Modeling of Double Pendulum Tower Cranes Considering Distributed Mass Payloads and Variable Rope Lengths

Yaxuan Wu	Nankai University
Qingxiang Wu	Nankai University
Shudong Guo	Department of Research and Informatizatio Taian Quality and Technical Inspection and Testing Institute (Taian Special Equipment Inspection and Research Institute)
Ruiping Pang	Department of the Mechanical and Electrical Shandong Luneng Special Equipment Inspection and Testing Co., Ltd
Tong Yang	Institute of Robotics and Automatic Information Systems (IRAIS) College of Artificial Intelligence Nankai University
Ning Sun	Institute of Robotics and Automatic Information Systems College of Artificial Intelligence Nankai University

10:45-11:00 MoA05-2

Design and Analysis of Power Reaching Law Sliding Mode Controller under DoS Attacks

Shenshen Li	Hefei University of Technology
Haibo Du	Hefei University of Technology
Weile Chen	Southeast University
Wenwu Zhu	Hefei University of Technology
Xiangze Lin	Nanjing Agricultural University

11:00-11:15 MoA05-3

An Output Voltage Tracking Control Method with Current Constraint Capability for Disturbed LC-Type Three-Phase Inverters

Qinhao Tang	Southeast University
Saijin Huang	Southeast University
Xiangyu Wang	Southeast University
Xianghui He	Southeast University
Guanjun Li	Southeast University

11:15-11:30   **MoA05-4**

Finite-time Output-feedback Control for Path   Following of Unmanned Agricultural Tractors

Wenhao Yang	Jiangsu University
Jinlin Sun	Jiangsu University
Lu Liu	Jiangsu University
Yonggui Zha	Zhejiang Zhenghao Refractory Materials Co., Ltd
Yongqi Jiang	Zhejiang Zhenghao Refractory Materials Co., Ltd

11:30-11:45   **MoA05-5**

A Novel Practical Terminal Sliding Mode Controller Design of Boost Converters

Jun Xia	Jiangsu University
Jinlin Sun	Jiangsu University
Xiaoyan Diao	Jiangsu University
Lu Liu	Jiangsu University
Shihong Ding	Jiangsu University

11:45-12:00   **MoA05-6**

Disturbances Observer-Based Fixed-Time Sliding Mode Control for Three-Level NPC Converters in Microgrid

Guangxin Liu	Harbin Institute of Technology
Xiaoning Shen	Harbin Institute of Technology
Jianhua Zhang	North China Electric Power University
Yabin Gao	Harbin Institute of Technology
Jianxing Liu	Harbin Institute of Technology

12:00-12:15   **MoA05-7**

Neural Network-Based Terminal Sliding Mode Control for Insulator Cleaning Robots

Jie Jin	Harbin Institute of Technology
Xiaoning Shen	Harbin Institute of Technology
Qiaoman Zhu	Jianghuai Advance Technology Center
Weiliang Chen	Harbin Institute of Technology
Zhuang Liu	Harbin Institute of Technology
Jianxing Liu	Harbin Institute of Technology

12:15-12:30   **MoA05-8**

Adaptive Fixed-time Current Sharing Control for Parallel DC-DC Buck Converter System

Qinchen Jiang	Zhejiang University of Technology
Jiayi Rong	Zhejiang University of Technology
Junxiao Wang	Zhejiang University of Technology

MoA06: Robotics and Mechatronics in Industrial Applications
Time: 10:30-12:30
Place: Songshan B

Chair:
Yongping Pan	Sun Yat-sen University
Kenan Yong	Nanjing University of Aeronautics and Astronautics

10:30-10:45   MoA06-1

A Visual SLAM Method Based on Semantic Segmentation Network in Dynamic Scenes
Peng Yifan	Nanjing University of Science and Technology
Xu Rui	Nanjing University of Science and Technology
Xu Yumen	Nanjing University of Science and Technology
Wu Yifei	Nanjing University of Science and Technology

10:45-11:00   MoA06-2

Real-Time Motion Planning of UAV for Dynamic Target Tracking in Complex Environments
Fan Yang	Hangzhou Dianzi University
Lu Qiang	Hangzhou Dianzi University
Botao Zhang	Hangzhou Dianzi University
Youngjin Choi	Hanyang University

11:00-11:15   MoA06-3

A Comparative Study of Hough Transform and PCA for Bolt Orientation Detection
Antonio Gambale	Ulster University
Sonya Coleman	Ulster University
Dermot Kerr	Ulster University
Philip Vance	Ulster University
Emmett Kerr	Atlantic Technological University
Cornelia Fermuller	Institute for Advanced Computer Studies University of Maryland USA
Yiannis Aloimonos	Institute for Advanced Computer Studies University of Maryland USA

11:15-11:30   **MoA06-4**

Pixel-based Hole Quality Evaluation in Robot Drilling Manufacturing Process

Chaoyue Niu	The University of Sheffield
Bin Chen	The University of Sheffield
Erica Smith	Advanced Manufacturing Research Centre with Boeing, The University of Sheffield
Rob Bramley	Advanced Manufacturing Research Centre with Boeing, The University of Sheffield
Pete Crawforth	Advanced Manufacturing Research Centre with Boeing, The University of Sheffield
Mahdi Mahfouf	The University of Sheffield
Visakan Kadirkamanathan	The University of Sheffield

11:30-11:45   **MoA06-5**

Efficient Collision-Free Dual-Stage-BSpline Path Planning For Mobile Robot

Zhan Tengda	Nanjing University of Science and Technology
Wu Yifei	Nanjing University of Science and Technology

11:45-12:00   **MoA06-6**

Composite Learning Cartesian Impedance Control Under Uncertain Robot Dynamics

Yongping Pan	Sun Yat-sen University
Kaiwei Ling	Sun Yat-sen University
Tian Shi	Sun Yat-sen University
Weibing Li	Sun Yat-sen University

12:00-12:15   **MoA06-7**

Adaptive Robot Visual Tracking with Camera and Dynamic Parameter Convergence

Yongping Pan	Sun Yat-sen University
Jingxuan Zhang	Sun Yat-sen University
Beixian Lai	Sun Yat-sen University
Zhiwen Li	Sun Yat-sen University
Weibing Li	Sun Yat-sen University

12:15-12:30   **MoA06-8**

SGD-SLAM: A Real-Time RGB-D Visual SLAM for Dynamic Scenes Using Semantic Geometric and Depth Information

Siyu Zhou	Nanjing University of Science and Technology
Sheng Li	Nanjing University of Science and Technology
Wencheng Zou	Nanjing University of Science and Technology

MoA07: Robust and Trustworthy Perception Planning and Control of Connected and Autonomous Vehicles
Time: 10:30-12:30
Place: Taihangshan

Chair:

Yang Li	Hunan University
Dachuan Li	Southern University of Science and Technology

10:30-10:45   MoA07-1

A Novel Unsupervised Anomaly Detection Method on Adversarial Attacks for Autonomous Vehicles Trajectory Prediction

Jiping Fan	Beijing Institute of Technology
Zhenpo Wang	Beijing Institute of Technology
Guoqiang Li	Beijing Institute of Technology

10:45-11:00   MoA07-2

An MCTS-based Intersection Collaboration Method for Multi-AGV in Automated Container Terminals

Xiaowei Wang	Hunan University
Shi Chen	Hunan University
Yang Li	Hunan University
Chenlong Yin	Hunan University
Liang Han	CRRC Zhuzhou Institute Co., LTD
Kai Cao	Hunan University

11:00-11:15   MoA07-3

A Robust Camera-LiDAR Fusion Framework for 3D Object Detection in High-Dust Environments

Mingyuan Wang	Beihang University
Wentao Liu	Beihang University
Bin Zhou	Beihang University
Zhangyu Wang	Beihang University
Runsen Liu	Beihang University
Hanyu Wang	Hefei Metro Research Institute Co., Ltd.

11:15-11:30   MoA07-4

A LiDAR-Camera Fusion Network for Small Object Detection in Open-pit Mining Areas

Muzhuo Liu	Beihang University
Jie Wang	Beihang University
Bin Zhou	Beihang University
Zhangyu Wang	Beihang University
Wentao Liu	Beihang University
Mingyuan Wang	Beihang University

11:30-11:45   MoA07-5

Adaptive Spacing Policy for Smooth Cooperative Cut-In Control in Mixed Traffic Flow

Haoyang Dong	Hunan University
Yang Li	Hunan University
Xuan Wang	College of Mechanical and Vehicle Engineering, Hunan University
Zhuo Yang	Beijing Aerospace Zhongxin Technology Co., Ltd
Hongmao Qin	College of Mechanical and Vehicle Engineering, Hunan University
Lei Zhu	Mogo.ai Information and Technology Co., Ltd

11:45-12:00   MoA07-6

Forward Long-Distance 3D Reconstruction in Rail Transit Scenarios Based on Occupancy Networks

Hongbo Li	Beihang University
Zhangyu Wang	Beihang University
Songyue Yang	Beihang University
Hao Wang	Beihang University
Wentao Liu	Beihang University
Guizhen Yu	Beihang University

12:00-12:15   MoA07-7

M3VDT:Monocular 3D Vehicle Detection and Tracking In Driving Videos

Di Tian	Wenhua College
Bingyao Hu	Huazhong University of Science and Technology
Wenyi Zeng	Wuhan Maritime Communication Research Institute
Yaping Qiu	Wenhua College
Changyuan Chen	Wenhua College
Qin Qiu	China Automotive Technology & Research Center Co., Ltd

12:15-12:30   MoA07-8

ICSGD-Momentum: SGD Momentum Based on Inter-Gradient Collision

Weidong Zou	Beijing Institute of Technology
Weipeng Cao	Guangdong Laboratory of Artificial Intelligence and Digital Economy (Shenzhen)
Yuanqing Xia	Beijing Institute of Technology
Bineng Zhong	Guangxi Normal University
Dachuan Li	Southern University of Science and Technology

MoB01: Safe Planning and Control for Autonomous Driving using Artificial Intelligence Technology
Time: 13:30-15:30
Place: Huashan A

Chair:
Yanbo Lu   Tsinghua University
Zhenwu Fang   National University of Singapore

13:30-13:45   **MoB01-1**
Deep Reinforcement Learning-based End-to-End Navigation of Mobile Robots With Reward Shaping
Yufeng Li   Northwestern Polytechnical University
Jian Gao   Northwestern Polytechnical University
Yimin Chen   Northwestern Polytechnical University
Yaozhen He   Northwestern Polytechnical University
Boxu Min   Northwestern Polytechnical University

13:45-14:00   **MoB01-2**
Robust Yaw Moment Control Considering Vehicle Stability and Energy Efficiency For Distributed Drive Electric Vehicle
Haoran Zhao   National University of Singapore
Faan Wang   Kunming University of Science and Technology

14:00-14:15   **MoB01-3**
Continuous Decision-making for Risk-based Collision Avoidance in Autonomous Driving Using Twin-delayed DDPG
Shaohui Fan   Qilu University of Technology (Shandong Academy of Sciences)
Xinjian Fan   Qilu University of Technology (Shandong Academy of Sciences)
Yong Wang   Qilu University of Technology (Shandong Academy of Sciences)

14:15-14:30   **MoB01-4**
A Study of Slope Path Tracking for Tracked Vehicles in Hilly Mountainous Areas
Boyang Wang   KunMing University of Science and Technology
Zhaoguo Zhang   KunMing University of Science and Technology
Faan Wang   KunMing University of Science and Technology
Xinqi Liu   KunMing University of Science and

	Technology
Kaiting Xie	KunMing University of Science and Technology
Chang Ni	KunMing University of Science and Technology

14:30-14:45   MoB01-5

Research on Track Vehicle Path Tracking Algorithm Based on Improved PSO

Chang Ni	Kunming University of Science and Teachnology
Zhaoguo Zhang	Kunming University of Science and Teachnology
Faan Wang	Kunming University of Science and Teachnology
Boyang Wang	Kunming University of Science and Teachnology
Kaiting Xie	Kunming University of Science and Teachnology
Shuang Feng	Kunming University of Science and Teachnology

14:45-15:00   MoB01-6

A Highway Lane Changing Trajectory Planning Method Considering Vehicle Motion Characteristics and Athropomorphization

Gang Li	Liaocheng University
Deying Feng	Liaocheng University
Dawei Wang	Liaocheng University
Dongxin Xu	Liaocheng University
Zhengfeng Chen	Liaocheng University
Jian Wu	Liaocheng University

15:00-15:15   MoB01-7

Adaptive Control of Yaw Stability of Distributed Drive Electric Vehicles under Extreme Conditions

Fukuo Ma	Liaocheng University
Zhengfeng Chen	Liaocheng University
Qinghua Cao	Liaocheng University
Dawei Wang	Liaocheng University
Gang Li	Liaocheng University
Jian Wu	Liaocheng University

15:15-15:30   **MoB01-8**

Applying Deep Q-Networks to Local Route Optimization

Gustavo Caiza   Universidad Politecnica Salesiana

David Soto   Universidad Internacional de La Rioja, UNIR

Paulina Ayala   Universidad Tecnica de Ambato

Marcelo Garcia   Universidad Tecnica de Ambato

MoB02: Safety-Oriented Risk Assessment and Advanced Control for Intelligent Connected Vehicles
Time: 13:30-15:30
Place: Huashan B

Chair:
Yan Wang	Hong Kong Polytechnical University
Liwei Xu	Southeast University

13:30-13:45 MoB02-1

AI-Driven Assessment of Safety Risk at Road Intersections Using Drone Videos

Shile Zhang	The Hong Kong Polytechnic University
Yan Wang	The Hong Kong Polytechnic University
Yongjun Yan	Nanjing University of Science and Technology

13:45-14:00 MoB02-2

Adaptive Estimation for Vehicle Suspension Parameters Considering Noise Uncertainty

Jiansen Yang	CATARC (Tianjin) Automotive Engineering Research Institute Co., Ltd
Shengkun Wang	CATARC (Tianjin) Automotive Engineering Research Institute Co., Ltd
Nan You	CATARC (Tianjin) Automotive Engineering Research Institute Co., Ltd
ShaoHua Li	State Key Laboratory of Mechanical Behavior and System Safety of Traffic Engineering Structures, Shijiazhuang Tiedao University
Xin Li	CATARC (Tianjin) Automotive Engineering Research Institute Co., Ltd

14:00-14:15 MoB02-3

Robust Control of Mixed Platoon with Uncertain Driving Style Parameters and Response Delays

Mingcheng Xu	Southeast University
Liwei Xu	Southeast University
Yan Wang	The hongkong polytechnic university

14:15-14:30   **MoB02-4**

Safety Risk Evaluation Based Autonomous Vehicle Decision-Making Approach for Cut-In Emergency Scenario

Yu Wang	Beihang University
Yaoguang Cao	Beihang University
Bin Sun	Beihang University
Tianyang Gong	Jilin University
Jingyun Xu	Beihang University
Jiayi Lu	Beihang University
Shichun Yang	Beihang University

14:30-14:45   **MoB02-5**

GCN-Enhanced Multi-Agent MAC Protocol for Vehicular Communications

Mengfei Li	Beijing University of Posts and Telecommunications
Wei Wang	Sichuan Jiuzhou Electronic Group Co. Ltd.
Shijie Feng	Beijing University Of Posts and Telecommunications
Tiange Fu	Beijing University of Posts and Telecommunications
Yan Wang	The hongkong polytechnic university
Hui Zhang	Beijing Jiaotong University

14:45-15:00   **MoB02-6**

Research on Detection of Floating Objects on Water Surface Based on Faster-RCNN

Penglin Wei	China Communications Information Technology Group Co.,Ltd.
Liru Hua	China Communications Information Technology Group Co.,Ltd.
Shu Yang	China Communications Information Technology Group Co.,Ltd.
Liang Sun	China Communications Information Technology Group Co.,Ltd.
Ruibo Tang	China Communications Information Technology Group Co.,Ltd.
Pengying Zhou	China Communications Information Technology Group Co.,Ltd.
Mo Chen	PT. China Road And Bridge Construction Indonesia

15:00-15:15   **MoB02-7**

Real-Time Estimation Method of Heavy Vehicle Mass and Road Slope

Dingge Fan	Nanjing University of Science and Technology
Dawei Pi	Nanjing University of Science and Technology
Pengyu Xue	Nanjing university of science and technology
Xian Li	Nanjing university of science and technology
Shilong Tao	Nanjing university of science and technology
Xianhui Wang	Nanjing University of Science and Technology

15:15-15:30   **MoB02-8**

Fault-Tolerant Path Tracking Control for Electric Vehicles with Steering Actuator Faults via Learning-Based Fault Detection

Cheng Tian	The Hong Kong Polytechnic University
Chao Huang	The Hong Kong Polytechnic University
Hailong Huang	The Hong Kong Polytechnic University
Jing Zhao	Northeastern University

MoB03: Zero-Touch Network and Service Management Towards Industry 5.0
Time: 13:30-15:30
Place: Hengshan A

Chair:
Haoran Chi	Universidade de Aveiro
Haijun Zhang	Harbin Institute of Technology(Shenzhen)

13:30-13:45   MoB03-1
IoT-based Adaptive Quarantine Strategy for Infectious Disease Control
Hao Wang	City University of Hong Kong
Zhigao Zheng	Wuhan University
Chi Sing Leung	City University of Hong Kong
Kim Fung Tsang	City University of Hong Kong

13:45-14:00   MoB03-2
TSN cfgNCT: Practical Implementation of a TSN Configurator with Negligible Computation Time
Junhui Jiang	Harbin Engineering University
Shanyu Jin	Harbin Engineering University
Mengmeng Yu	Nestfield Co., Ltd
Won Seok Song	Nestfield Co., Ltd
Yu Chul Kim	Nestfield Co., Ltd
Seung Ho Hong	Hanyang University
Hyeong Hak Lee	Nestfield Co., Ltd
Hyodong Kim	Nestfield Co., Ltd

14:00-14:15   MoB03-3
On Efficient Data Sharing for Planetary Digital Twins: Distributed Microplastic Monitoring
Everson da Silva Flores	Federal University of Rio Grande
Marcelo Rita Pias	Federal University of Rio Grande
Cristiana Lima Dora	Federal University of Rio Grande
Marcelo de Gomensoro Malheiros	Federal University of Rio Grande
Thomaz Prereira da Silva Junior	Federal University of Rio Grande
Alberto Alves Cabral	Federal University of Rio Grande
Bruna Guterres	Federal University of Rio Grande
Paula Alice Bezerra Barros	Federal University of Rio Grande
Thiago Alves Teixeira	Federal University of Rio Grande
Luis Poersch	Federal University of Rio Grande
Wilson Wasielesky	Federal University of Rio Grande

14:15-14:30   **MoB03-4**

ParallelFarm: An AI-Enabled Sustainable Farming Management System for Carbon Neutrality

Gaoshan Bi	University of Sheffield
Yu Zhang	University of Sheffield
Qing Xue	Mutus-Tech Ltd
Yang Li	Mutus-Tech Ltd
Zhipeng Yuan	The University of Sheffield
Tong Liu	University of Sheffield
Kang Liu	University of Sheffield
Po Yang	The University of Sheffield

14:30-14:45   **MoB03-5**

CFA-OpenRAN: An Integrated Communication Computing and Control Architecture for Wireless Cloud Fog Automation Based on O-RAN

Yijia Liu	University of Navarra
Zhibo Pang	ABB Corporate Research
Yuemin Ding	University of Navarra

14:45-15:00   **MoB03-6**

Improved Distributed Consensus Fusion for Industrial Multi-Target Tracking

Zhen Chen	Hangzhou Dianzi University
Yinjun Guo	Hangzhou Dianzi University
Yifang Shi	Hangzhou Dianzi University

15:00-15:15   **MoB03-7**

Optimizing Electric Vehicle Revenue Based on Dynamic Pricing and Integration of Renewable Energy Resources

Morteza Jalilirad	University of Aveiro
Majid Mehrasa	San Diego State University
Rui Martins	University of Aveiro
Haoran Chi	Instituto de Telecomunicações and Universidade de Aveiro
Ayman Radwan	Instituto de Telecomunicações

15:15-15:30   **MoB03-8**

FLARES: A Framework for Large-scale Agent-based Rapid Epidemic Simulation

Ruoling Peng	University of Sheffield
Kang Liu	University of Sheffield
Po Yang	The University of Sheffield

MoB04: Advanced Control Algorithms and Applications for Intelligent Electrified Vehicle
Time: 13:30-15:30
Place: Hengshan B

Chair:
Chao Yang   Beijing Institute of Technology
Yahui Zhang   Yanshan University
Tianqi Qie   Beijing Institute of Technology

13:30-13:45   **MoB04-1**
Circuit Design and Fusion Signal Processing Based on Uncertain Algorithm for Intelligent Wheel Speed Sensor of Integrated-Electronic-Parking-Braking system
Zheng Zhu   Tsinghua University
Xiangyu Wang   Tsinghua University
Liang Li   Tsinghua University
Zhaonan Li   Tsinghua University

13:45-14:00   **MoB04-2**
Autonomous Collision Avoidance Based on Linear Time-Varying Model Predictive Control
Huijian Liu   Chery Automobile Co., Ltd
Chengye Wu   Yanshan university
Yahui Zhang   Yanshan university
Xiangyu Wang   Tsinghua University
Liang Li   Tsinghua University

14:00-14:15   **MoB04-3**
Mechanism Analysis of the Instability in Series Hybrid Electric Powertrain
Wei Liu   Beijing Institute of Technology
Chao Yang   Beijing Institute of Technology
Zehua Ren   KAMA Automobile Manufacturing Co.,Ltd
Sibo Kan   Beijing Institute of Technology

14:15-14:30   **MoB04-4**
Fault-Tolerant Sideslip Angle Estimation for Four-Wheel Distributed Drive and Brake Vehicle
Zhaonan Li   Tsinghua University
Zheng Zhu   Tsinghua University
Xiangyu Wang   Tsinghua University
Liang Li   Tsinghua University
Ruochen Wang   Tsinghua University
Zhixian Fan   Zhongtong Bus Co., Ltd.

14:30-14:45   **MoB04-5**

A Review of Electric Vehicle Charging Technologies and Beyond

Henglai Wei	Beihang University
Yanmei Tang	China Electric Power Research Institute
Jicheng Chen	Hong Kong University of Science and Technology
Kai Jiang	Beihang University
Qingchao Liu	Jiangsu University
Michael Galea	Università ta' Malta

14:45-15:00   **MoB04-6**

Cable Segmentation Based on Mask2Former in Open-Pit Mining Area

Liyun Wang	Beihang University
Bin Zhou	Beihang University
Songyue Yang	Beihang University
Wentao Liu	Beihang University
Huazhi Li	Beihang University
Shengdi Sun	Beihang University

15:00-15:15   **MoB04-7**

Dual-layer Path Planning for Unmanned Ground Vehicles Based on Probabilistic Roadmap and Proximal Policy Optimization

Zhixuan Han	Beihang University
Peng Chen	Beihang University
Bin Zhou	Beihang University
Guizhen Yu	Beihang University

15:15-15:30   **MoB04-8**

Awnet: Negative Obstacle Semantic Segmentation Network Based on Adaptive Weight Loss

Jiarui Zhao	Beihang University
Jie Wang	Beihang University
Zhangyu Wang	Beihang University
Junjie Zhang	Beihang University
Yunsong Feng	National University of Defense Technology
Guizhen Yu	Beihang University

MoB05: Advanced Monitoring and Control for Cyber-Physical Systems 02
Time: 13:30-15:30

Place: Songshan A

Chair:

Ning He	Xi'an University of Architecture and Technology
Huiping Li	Northwestern Polytechnical University

13:30-13:45   MoB05-1

A Comprehensive Risk Analysis Method for Process Industry from the Perspective of Cyber-Physical Systems

Xin zhang	Instrumentation Technology and Economy Institute
Yao Liu	Instrumentation Technology and Economy Institute
Linkun Wang	Instrumentation Technology and Economy Institute
Zouqing Meng	Instrumentation Technology and Economy Institute

13:45-14:00   MoB05-2

Parameter Identification Based on Generalized Orthonormal Basis Function Without Persistent Excitation: A Learning-Based Paradigm

Kuan Li	Shanghai Aerospace Control Technology Institute
Weijie Su	Shanghai Aerospace Control Technology Institute
Xingyong Li	Shanghai Aerospace Control Technology Institute
Yang He	Shanghai Aerospace Control Technology Institute
Minchang Huang	Shanghai Aerospace Control Technology Institute
Hao Luo	Harbin Institute of Technology

14:00-14:15   MoB05-3

MARS: Safely Instrumenting Runtime Monitors in Real-time Resource-constrained Distributed Systems

Giann Spilere Nandi	CISTER, Polytechnic Institute of Porto
David Pereira	CISTER, Polytechnic Institute of Porto
José Proença	CISTER, Polytechnic Institute of Porto
Eduardo Tovar	CISTER, Polytechnic Institute of Porto

14:15-14:30 **MoB05-4**

Grasping Trajectory Generation of a 7-Dof Robotic Arm Based on Cartesian Direct Teaching Technology

Yaxin Xu	Shandong University
Meijun Tian	Shandong University
Puying Shen	Shandong University
Guoteng Zhang	Shandong University

14:30-14:45 **MoB05-5**

A OPC UA Based Execution Engine for Production Control in Decentral Organized Manufacturing

Andreas Ebner	Fraunhofer IOSB
Florian Düwel	Fraunhofer Institute of Optronics, System Technologies and Image Exploitation IOSB
Julius Pfrommer	Fraunhofer IOSB

14:45-15:00 **MoB05-6**

Dynamic Event-Triggered MPC for Non-holonomic Robots with Disturbances

Zhongxian Xu	Xi'an University of Posts and Telecommunications
Shuoji Chen	Xi'an University of Architecture and Technology
Dongyuan Tian	Xi'an University of Architecture and Technology
Fei Yan	Xi'an University of Posts and Telecommunications
Liyin Zhang	Xi'an University of Posts and Telecommunications

15:00-15:15 **MoB05-7**

Receding Horizon SOH Estimation of Lithium-ion Battery Based on Novel Health Indicator

Ziqi Yang	Xi'an University of Architecture and Technology
Ning He	Xi'an University of Architecture and Technology
Cheng Qian	Xi'an University of Architecture and Technology
Jiaze Ni	Xi'an University of Architecture and Technology

15:15-15:30 **MoB05-8**

LWLC-CNN: Ultra-lightweight Network Traffic Classification Algorithm

Xing Jinhui	Xi'an Technological University
Chen Zhang	南京熊猫汉达科技有限公司
Zhang Hui	南京熊猫汉达科技有限公司
Yanfang Fu	Xi'an Technological University
Yan Guochuang	中国兵器工业试验测试研究院
Du Jiang	中国兵器工业试验测试研究院

MoB06: AI-Driven Green Industrial Innovations
Time: 13:30-15:30
Place: Songshan B

Chair:

Hao Zhang	Wuhan University of Technology
Chuang Gao	Shanghai Advanced Raesearch Institute, Chinese Academy of Sciences

13:30-13:45   MoB06-1

A Stackelberg Game-Based Electric Carbon Market Trading Mechanism for Shared Energy Storage Considering Carbon Capture, Utilization, and Storage

Liang Yunyang	China University of Petroleum, Beijing
Li Yi-Chang	China University of Petroleum, Beijing
He Yike	China University of Petroleum, Beijing
Mengmeng Yu	Nestfield Co., Ltd

13:45-14:00   MoB06-2

Towards Multi-fabric Garment Detection

Markus Leitner	PROFACTOR GmbH
Michael Teuchtmann	i-RED Infrarot Systeme GmbH

14:00-14:15   MoB06-3

The Application of AI Technology in the Field of Green Logistics Packaging

Zezhi Yuan	Wuhan Technology and Business University

14:15-14:30   MoB06-4

Optimizing Emergency Medical Supplies Dispatch Using Deep Embedded Clustering and PSO During Public Health Crises

Ying Ma	Wuhan University of Technology
Qianlong Wu	Wuhan University of Technology

14:30-14:45   MoB06-5

A Study on the Benefit-Sharing Mechanism in Joint Development of Commercial Airplanes: Based on the Perspective of Supplier-Manufacturer Game

Xiaofang Chen	Wuhan University of Technology
Yanxin Hou	Wuhan University of Technology

14:45-15:00   MoB06-6

Intelligent Pressure Reconstruction of Centrifugal Compressor Based on Gappy POD and Sparse Measurement

Xuhui Li	Beijing Institute of Technology
Chenxing Hu	Beijing Institute of Technology
Jingyu Peng	Beijing Institute of Technology

15:00-15:15 **MoB06-7**

Three-Dimension Numerical Simulation of Combustion Performace in High-Temperature Alloy Combustion Chambers

Haitian Zhu	Chinese Academy of Sciences
Chuang Gao	Chinese Academy of Sciences

15:15-15:30 **MoB06-8**

Environmental Impact on Steady-state and Transient Performance of Heavy-Duty Truck Gas Turbine

Jiao Li	Shanghai Jiao Tong University
Wenjia Sun	Helan Turbines Co., Ltd
Yueheng Wang	Shanghai Jiao Tong University
Houqi Wei	Shanghai Jiao Tong University
Yuzhang Wang	Shanghai Jiao Tong University

MoB07: Control, Planning, and Fault Diagnosis of Autonomous Systems
Time: 13:30-15:30
Place: Taihangshan

Chair:
Shuai Yan	Beijing Institute of Technology
Jue Wang	Ningbo Institute of Intelligent Equipment Technology

13:30-13:45   MoB07-1

Valid RBFNN Adaptive Control for Linear Spacecraft Systems with Matched Uncertainties
Runze Zheng	Beijing Institute of Technology
Hao Yu	Beijing Institute of Technology
Renjian Hao	Beijing Institute of Control Engineering
Dawei Shi	Beijing Institute of Technology

13:45-14:00   MoB07-2

Adaptive Robust Fault-Tolerant Control for Quadrotor with Complete Actuator Failure: A Unified Active Method
Weisheng Liang	Zhejiang University
Hong Duan	Zhejiang University
Zheng Chen	Zhejiang University
Bin Yao	Purdue University

14:00-14:15   MoB07-3

Design and Modeling of a Retractable Flexible Arm Inspired by the Nycticorax Violaceus
Haoyu Liu	Beijing Institute of Technology
Caixin Zhang	Beijing Institute of Technology
Yuru Piao	Beijing Institute of Technology
Yiyong Sun	Beijing Institute of Technology
Guan Zhai	Beijing Institute of Technology
Bin Liang	Tsinghua University

14:15-14:30   MoB07-4

Research on Bearing Fault Diagnosis Based on DT-RF-NB Ensemble Model
Xiaochen Shao	University of Chinese Academy of Sciences
Lunxing Li	Shenyang Institute of Computing Technology Chinese Academy of Sciences
Li Xin	University of Chinese Academy of Sciences
Beibei Li	Shenyang Institute of Computing Technology Chinese Academy of Sciences

14:30-14:45   **MoB07-5**

Robust Actuator Fault Detection for Half-car Active Suspension with External Disturbances and Measurement Noises

Xuejie Guo   Harbin Institute of Technology
Jue Wang   Ningbo Institute of Intelligent Equipment Technology
Weichao Sun   Harbin Institute of Technology

14:45-15:00   **MoB07-6**

Real-Time Path Planning and Interception for Multi-AUVs Using Fusion of Improved RRT and DWA Algorithms

changcheng hu   Shanghai Maritime University
Bing Sun   Shanghai Maritime University
Su Zinan   Shanghai Maritime University

15:00-15:15   **MoB07-7**

Fault Detection Based on Attention Mechanism for Grid-connected Photovoltaic Systems

Jincan Li   Guangxi Power Grid Company Limited
Jingshun Li   Guilin Power Supply Bureau
Yiyu Chen   Guilin Power Supply Bureau
Peidong Sha   Guilin Power Supply Bureau
Ming Jiang   Guilin Power Supply Bureau
Taiping Jiang   Guilin Power Supply Bureau
Yusen Zhang   Shandong University
Feng Gao   Shandong University

15:15-15:30   **MoB07-8**

Evaluation of the Secure PROFINET Application Relation Establishment Performance

Julian Göppert   Hochschule Offenburg
Axel Sikora   HS Offenburg

MoC01: Factory Automation and Communication Systems
Time: 16:00-18:00
Place: Huashan A

Chair:

Yijia Xie	Beihang University
Rebekka Neumann	University of Stuttgart

16:00-16:15   MoC01-1

Orchestration of Heterogeneous, Distributed, Real-Time Control Containers

Moritz Walker	University of Stuttgart
Leonard Rupietta	University of Stuttgart
Michael Neubauer	University of Stuttgart
Armin Lechler	University of Stuttgart
Alexander Verl	University of Stuttgart

16:15-16:30   MoC01-2

Chaotic Pendulum in Industrial Control and Automation Software

Aydin Homay	TU Dresden
Martin Wollschlaeger	TU Dresden
Mario de Sousa	University of Porto, Engineering Faculty

16:30-16:45   MoC01-3

Application of Granularity Patterns in Industrial Automation Software

Aydin Homay	TU Dresden
Mario de Sousa	University of Porto, Engineering Faculty
Martin Wollschlaeger	TU Dresden

16:45-17:00   MoC01-4

Integrated Management of Multi-Type Devices through Aggregation of Information Models

Peizhe Li	Shanghai Jiao Tong University
Yonghui Liang	Shanghai Jiao Tong University
Hui Li	Shanghai Jiao Tong University
Qimin Xu	Shanghai Jiao Tong University
Shanying Zhu	Shanghai Jiao Tong University
Cailian Chen	Shanghai Jiao Tong University

17:00-17:15   MoC01-5

SDN-Based Fault-Resilient Scheme for Wireless Industrial Internet of Things

Qingwei Sun	Lanzhou University
Jinglong Zhang	Shanghai Jiao Tong University
Shanying Zhu	Shanghai Jiao Tong University
Dongdong Zhao	Lanzhou University
Tianyi Ren	Lanzhou University

17:15-17:30   **MoC01-6**

Detecting High Fuel Consumption in HDVs with Ensemble of Anomaly Detection Models

Berkay Baris Turan	Sabanci University
Emre Genc	Sabanci University
Inci Nil Akcig	Sabanci University
Neslihan Goztepe	Sabanci University
Mehmet Emin Mumcuoglu	Sabanci University
Mustafa Unel	Sabanci University

17:30-17:45   **MoC01-7**

An EfficientNet-Based Transfer Learning System for Defect Classification in Manufacturing

Muhammad Rashid Rasheed	Ulster University
Sonya Coleman	Ulster University
Bryan Gardiner	Ulster University
Philip Vance	Ulster University
Cormac McAteer	Seagate Technology
Khoi Nguyen	Seagate Technology

17:45-18:00   **MoC01-8**

Analysis of the Applicability of Cloud Computing Scaling Techniques for Real-Time Workloads of Industrial Control Systems

Rebekka Neumann	University of Stuttgart
Florian Frick	University of Stuttgart
Armin Lechler	University of Stuttgart
Alexander Verl	University of Stuttgart

MoC02: Human Computer and Machine Interaction
Time: 16:00-18:00
Place: Huashan B

Chair:

Fei Meng	University of Shanghai for Science and Technology
Zohra Charania	Technische Universität Dresden

16:00-16:15   **MoC02-1**

A Cost-Efficient FOC-Controlled Haptic Knob for Industrial Robot Programming with Force Feedback

Junsheng Ding	Fortiss GmbH
Xiangyu Fu	Fortiss GmbH
Tiantian Wei	Fortiss GmbH
Alexander Perzylo	Fortiss GmbH

16:15-16:30   **MoC02-2**

Fingerspelling Classification for Robot Control

Kevin McCready	Ulster University
Sonya Coleman	Ulster University
Dermot Kerr	Ulster University
Nazmul Siddique	Ulster University
Emmett Kerr	Atlantic Technological University
Yiannis Aloimonos	University of Maryland
Cornelia Fermüller	University of Maryland

16:30-16:45   **MoC02-3**

Automation of PGAA Spectra Analysis with Deep Learning

Daniel Boschmann	HSU/UniBW Hamburg
Christian Stieghorst	Research Neutron Source FRM II, Technical University of Munich
David Knezevic	Research Neutron Source FRM II, Technical University of Munich
Loubna Kadri	Engineering Materials Science Centre (GEMS) at MLZ Helmholtz-Zentrum Hereon GmbH
Oliver Niggemann	Helmut-Schmidt-University Hamburg

16:45-17:00 **MoC02-4**

Modeling and Control of an Omnidirectional Mobile Robot for Applications in Gait Learning

Victor Coch	Federal University of Rio Grande
Vinicius Oliveira	Federal University of Rio Grande
Leonardo Correa	Federal University of Rio Grande
Leticia Lopes	Federal University of Rio Grande
Gabriel Souza	Federal University of Rio Grande
Mateus Pinto	Federal University of Rio Grande

17:00-17:15 **MoC02-5**

Robust Control of Electric Power Steering System Based on Aligning Torque Model

Xiaohan Wu	Jiangsu University
Xing Xu	Jiangsu University
Long Chen	Jiangsu University
Yingfeng Cai	Jiangsu University

17:15-17:30 **MoC02-6**

Advancements in Industrial Visual Inspection: Harnessing Hyperspectral Imaging for Automated Solder Quality Assessment

Trishna Barman	Ulster University
Sonya Coleman	Ulster University
Dermot Kerr	Ulster University
Shane Harrigan	Ulster University
Justin Quinn	Ulster University

17:30-17:45 **MoC02-7**

A Deep Network Based Fault Diagnosis Method for Stabilization Loop of Inertial Platform

Zhaoxu Wang	Northwestern Polytechnical University
Huiping Li	Northwestern Polytechnical University
Siqi Yang	Northwestern Polytechnical University

17:45-18:00 **MoC02-8**

A Data-Driven Truck Dispatching Algorithm for a Sequence-Constrained Less-than-Truckload Container Transshipment Problem

Jiahui Gong	Xi'an Jiaotong-Liverpool University
Jianjun Chen	Xi'an Jiaotong-Liverpool University
Jun Qi	Xi'an Jiaotong-Liverpool University
Haiyang Zhang	Xi'an Jiaotong-Liverpool University

MoC03: Human Factors in Decision-Making, Planning and Control Technologies of Intelligent Vehicles
Time: 16:00-18:00
Place: Hengshan A

Chair:

Guodong Yin	Southeast University
Jinxiang Wang	Southeast University

16:00-16:15   MoC03-1

Research on Local Obstacle Avoidance Control Strategy of Smart Car Based on Remote Control

Hongliang Wang	Nanjing University of Science and Technology
Jianing Wang	Nanjing University of Science and Technology
Yixin Wang	Higer Bus
Dawei Pi	Nanjing University of Science and Technology
Yijie Chen	China North Vehicle Research Institude
Pengyu Xue	Nanjing University of Science and Technology

16:15-16:30   MoC03-2

Yaw Stability Control of Intelligent Electric Vehicle with Wheel Corner Module Based on Dynamic Stability Region

Xian Li	Nanjing University of Science and Technology
Dawei Pi	Nanjing University of Science and Technology
Pengyu Xue	Nanjing University of Science and Technology
Dingge Fan	Nanjing University of Science and Technology
Shilong Tao	Nanjing University of Science and Technology

16:30-16:45   MoC03-3

Personalized Adaptive Cruise Control Based on Passenger's Subjective Risk Evaluation and Model Predictive Control

Chenshuo Zhang	Nanjing University of Science and Technology
Yan Yongjun	Nanjing University of Science and Technology

Jinxiang Wu	Nanjing University of Science and Technology
Tingyu Zhang	Nanjing University of Science and Technology
Hongliang Wang	Nanjing University of Science and Technology
Dawei Pi	Nanjing University of Science and Technology

16:45-17:00   MoC03-4

Power Steering and Active Front Wheel Steering Control Strategy for EHCS on Commercial Vehicles

Sizhe Cheng	Southeast University
Dongming Han	Southeast University
Qixiang Zhang	Southeast University
Yicheng Yao	Southeast University
Jinxiang Wang	Southeast University
Guodong Yin	Southeast University

17:00-17:15   MoC03-5

Cooperative Adaptive Cruise Control Considering the Characteristics of Human-Driven Vehicle

Dongming Han	Southeast Univesity
Qixiang Zhang	Southeast Univesity
Sizhe Cheng	Southeast Univesity
Yicheng Yao	Southeast Univesity
Jinxiang Wang	Southeast Univesity
Guodong Yin	Southeast Univesity

17:15-17:30   MoC03-6

Human-Machine Cooperative Control for Semi-Autonomous Vehicles: Robustness and Optimality

Xiaomin Zhao	Hefei University of Technology
Binhe Li	Hefei University of Technology
Ye-Hwa Chen	Georgia Institute of Technology
Fangfang Dong	Hefei University of Technology

17:30-17:45   **MoC03-7**

An Emergency Escape Strategy Based on Reasonable Dynamic Constraints for Autonomous Vehicles

Lingfei Gao	Beihang University
Shichun Yang	Beihang University
Bin Sun	Beihang University
Jingyun Xu	Beihang University
Jiayi Lu	Beihang University
Xiaoyu Yan	Beihang University

17:45-18:00   **MoC03-8**

Depth-Aware Multi-Modal Fusion for Generalized Zero-Shot Learning

Weipeng Cao	Guangdong Laboratory of Artificial Intelligence and Digital Economy (Shenzhen)
Xuyang Yao	Shenzhen University
Zhiwu Xu	Shenzhen University
Yinghui Pan	Shenzhen University
Yixuan Sun	Stony Brook University
Dachuan Li	Southern University of Science and Technology
Bohua Qiu	ZhenDui Industry Artificial Intelligence Co. Ltd
Muheng Wei	ZhenDui Industry Artificial Intelligence Co. Ltd

MoC04: Industrial Digitalization Digital Twins in Industrial Applications
Time: 16:00-18:00
Place: Hengshan B

Chair:

Kai Jiang	Beihang University
Wenkai Hu	China University of Geosciences

16:00-16:15   MoC04-1

Knowledge-Enhanced Digital Twin for Industrial Production Process

Chao Yang	Aalto University
Yuan Zheng	Aalto University
Yuan Hua	Aalto University
Riku Ala-Laurinaho	Aalto University
Udayanto Dwi Atmojo	Aalto University
Kari Tammi	Aalto University

16:15-16:30   MoC04-2

Fault Injection for Synthetic Data Generation in Aircraft: A Simulation-Based Approach

Francesco Biondani	University of Verona
Nicola Dall'Ora	University of Verona
Francesco Tosoni	University of Verona
Enrico Fraccaroli	University of North Carolina at Chapel Hill
Franco Fummi	University of Verona
Domenico Migliore	Leonardo S.p.a.
Francesco Acerra	Leonardo S.p.a.

16:30-16:45   MoC04-3

Digital Twin Enabled Flight Control System Testing: A Physical-Virtual Mapping Experiment

Cheng Ren	Shanghai Jiao Tong University
Cailian Chen	Shanghai Jiao Tong University
Shanying Zhu	Shanghai Jiao Tong University
Yehan Ma	Shanghai Jiao Tong University
Xinping Guan	Shanghai Jiao Tong University

16:45-17:00 **MoC04-4**

Product Digital Twin Supporting End-of-life Phase of Electric Vehicle Batteries Utilizing Product-Process-Resource Asset Network

Sára Strakošová	Czech Technical University in Prague
Petr Novak	Czech Technical University in Prague
Petr Kadera	Czech Technical University in Prague

17:00-17:15 **MoC04-5**

Towards Digital Twin-Based Dataspaces for Industrial Computer Vision Services

Stefan Vogt	HTWD University of Applied Sciences
Paul Patolla	HTWD University of Applied Sciences
Johannes Metzler	HTWD University of Applied Sciences
Dirk Reichelt	HTW Dresden

17:15-17:30 **MoC04-6**

A Software Architecture for the Control and Management of Industrial Inspection Evidence

Nicolas Brasil	Federal University of Rio Grande
Victor Coch	Federal University of Rio Grande
Bruno Oliveira	Federal University of Rio Grande
Mateus Pinto	Federal University of Rio Grande
Gabriel Souza	Federal University of Rio Grande
Rafaella Lourenço	Federal University of Rio Grande
Luiza Lopes	Federal University of Rio Grande
Anajara Martins	Federal University of Rio Grande
Nelson Duarte Filho	Federal University of Rio Grande
Eder Mateus Gonçalves	Federal University of Rio Grande
Vinicius Oliveira	Federal University of Rio Grande
Marcelo Malheiros	Federal University of Rio Grande
Marcelo Pias	Federal University of Rio Grande
Eduardo Borges	Federal University of Rio Grande

17:30-17:45   **MoC04-7**

Digital Twin across Industry 5.0: Integrating Dimensional Analysis to a Rotor Inspection Module

Eder Mateus Gonçalves	Universidade Federal do Rio Grande
Bruno Oliveira	Federal University of Rio Grande
Gabriel R. Souza	Federal University of Rio Grande
Victor Coch	Federal University of Rio Grande
Nelson Lopes Duarte Filho	Universidade Federal do Rio Grande
Vinicius Oliveira	Federal University of Rio Grande
Marcelo Malheiros	Universidade Federal do Rio Grande
Marcelo Pias	Universidade Federal do Rio Grande
Eduardo Borges	Federal University of Rio Grande
Nicolas Brasil	Universidade Federal do Rio Grande
Rafaella Lourenço	Universidade Federal do Rio Grande
Anajara Martins	Universidade Federal do Rio Grande
Mateus Pinto	Universidade Federal do Rio Grande

17:45-18:00   **MoC04-8**

Bridging the Gap: Digital Twin Integration and Evaluation in Robotic Multi-Axis Additive Manufacturing

Tomáš Jochman	Czech Technical University in Prague
Václav Voltr	Czech Technical University
Václav Kubáček	CTU in Prague
Ondrej Svec	CTU CIIRC
Pavel Burget	CTU in Prague
Václav Hlaváč	Czech Technical University in Prague

MoC05: Modeling Intelligent Decision Making and Control of Electric Vehicles
Time: 16:00-18:00
Place: Songshan A

Chair:

Xinhua Liu	Beihang University
Fan Zhou	Beihang University

16:00-16:15   MoC05-1

SOC Estimation of Lithium-Ion Batteries Based on Transfer Learning Under Low Temperature Conditions

Xinglong Yang	FAW Bestune Automotive Co.,Ltd
Tianzhu Jiang	Jilin University
Ming Xu	FAW Bestune Automotive Co.,Ltd
Shun Li	FAW Bestune Automotive Co.,Ltd
Changjian Ji	FAW Bestune Automotive Co.,Ltd
Xueying Liu	FAW Bestune Automotive Co.,Ltd
Bin Ma	Jilin University

16:15-16:30   MoC05-2

Capacity Degradation Modeling and Lifetime Prediction of Lithium Battery in High Temperature Environments

Kaiyi Young	Beihang University
Wentao Wang	Beihang University
Lisheng Zhang	Beihang University
Shichun Yang	Beihang University
Xinhua Liu	Beihang University

16:30-16:45   MoC05-3

SOE Estimation of Lithium-Ion Battery Based on Strong Tracking Extended Kalman Filter

Haobo Zhang	Beihang University
Rui Cao	Beihang University
Yuntao Jin	Beihang University
Baitong Chang	Beihang University
Yue Zheng	Beihang University
Shichun Yang	Beihang University

16:45-17:00   **MoC05-4**

A Safety Assessment Method Based on Cloud Model for Decision-Making of Autonomous Vehicles

Shichun Yang	Beihang University
Qiuyue Li	Beihang University
Zhaowen Pang	Hainan University
Bin Sun	Beihang University
Xinjie Feng	Beihang University
Rui Wang	Beihang University
Tianyang Gong	Jilin University
Yaoguang Cao	Beihang University

17:00-17:15   **MoC05-5**

Energy Management Strategy Considering the Total Driving Cost of Fuel Cell Hybrid Electric Vehicle

Long Yin	Yanshan University
Jinghui Zhao	State Key Laboratory of Intelligent Agricultural Power Equipment
Menglin Li	Yanshan University
Mei Yan	Yanshan University
Hongwen He	Beijing Institute of Technology

17:15-17:30   **MoC05-6**

A Method for Implementing Sub-Nanosecond Fast Edge Pulse Signal

Yuanshou Hu	Metrology Testing Center, China Academy of Engineering Physics
Ziling Chen	Metrology Testing Center, China Academy of Engineering Physics
Rui Hu	Metrology Testing Center, China Academy of Engineering Physics

17:30-17:45   **MoC05-7**

Generating Adaptive Robotic Behaviours via Enhanced Diffusion Policy

Tianmei Jin	University of Warwick
Jiayi Zhang	University of Warwick

17:45-18:00   **MoC05-8**

Deep-Recurrent-Neural-Network-Based Adaptive Sliding Mode Control for a 6-DOF Serial Robot

Ningyu Zhu	Concordia University
Wen-Fang Xie	Concordia University
Onur Toker	Florida Polytechnic University

MoC06: Near Zero Emissions Pollution Control
Time: 16:00-18:00
Place: Songshan B

Chair:
Pan Wang   Jiangsu University
Xin Wang   Beijing Institute of Technology

16:00-16:15   **MoC06-1**
Study of the N2O Formation Mechanism in NOx-Assisted Heterogeneous Catalytic Combustion of Soot in CeO2-Based Catalytic Microchannel Reactor

Zonglin Li	School of Automotive Engineering Changzhou Institute of Technology
Pan Wang	School of Automotive and Traffic Engineering Jiangsu University
Tong Yan	School of Automotive and Traffic Engineering Jiangsu University
Lidong Zhang	National Synchrotron Radiation Laboratory University of Science and Technology of China
Hongyu Zhao	School of Automotive and Traffic Engineering Jiangsu University

16:15-16:30   **MoC06-2**
Insight into the Kinetics of Isomerization and β-Scission Reactions Following H-Abstraction in 2-Pentanone Combustion

Changluo Zheng	Jiangsu University
Pan Wang	Jiangsu University
Tong Yan	Jiangsu University
Jia Yan	Jiangsu University
Lidong Zhang	University of Science and Technology of China
Chengcheng Ao	Jiangsu University

16:30-16:45   **MoC06-3**
Co-Optimizing NOx Emission and Power of Engine-ORC Combined System by ANN and NSGA-II

Chongyao Wang	Beijing Insitute of Technology
Xin Wang	Beijing Insitute of Technology
Miao Wen	Beijing Institute of Technology
Jian Xu	Beijing Chengtian Advanced Technologies Limited

16:45-17:00   MoC06-4

Revealing the Effects of Moisture and Oxygen on Amine-Functionalized Macroporous Resin for Direct Air Capture

Shu Zhao	Shanghai Jiao Tong University
Yiran Zhang	Shanghai Jiao Tong University
He Lin	Shanghai Jiao Tong University

17:00-17:15   MoC06-5

The Effect of Nano-Structure Evolution on the Oxidation Activity and Elemental Occurrence during the Degradation of PM by Non-Thermal Plasma

Yunxi Shi	Jiangsu University
Daolong Hou	Jiangsu University

17:15-17:30   MoC06-6

A Fine-Grained CO_2 Monitoring System Using Aerial-Ground Cooperative Sensing

Songlin Yang	Fudan University
Tao Yang	Fudan University
Bo Hu	Fudan University
Liang Cheng	Fudan University
Lingchen Wang	Fudan University

17:30-17:45   MoC06-7

Heat Extraction Performance of L-Shape Gravity Heat Pipe for Coal Spontaneous Combusiton under Various Layout Spacings

Xing Lu	Xi'an University of Science and Technology
Xinyue Lang	Xi'an University of Science and Technology
Yang Xiao	Xi'an University of Science and Technology
Xulei Tong	Xi'an University of Science and Technology
Jun Deng	Xi'an University of Science and Technology
Ting Ma	Xi'an Jiaotong University

17:45-18:00   MoC06-8

Investigation on the Cooling Effect of Mechanical Ventilation Ducts for Separate Embankment

Jine Liu	Chang'an University
Benheng Deng	Chang'an University
Yue Zhai	Chang'an University
Jianbing Chen	CCCC First Highway Consultants Co. Ltd
Fuqing Cui	Chang'an University

MoC07: System and Software Engineering, Runtime Intelligence
Time: 16:00-18:00
Place: Taihangshan

Chair:

Yuchen Song	Harbin Institute of Technology
Antonio Pietrosanto	University of Salerno

16:00-16:15   **MoC07-1**

Updating and Refactoring Library Modules in IEC 61499

Michael Oberlehner	Johannes Kepler University Linz
Alois Zoitl	Johannes Kepler University Linz

16:15-16:30   **MoC07-2**

Intuitive Instruction of Robot Systems: Semantic Integration of Standardized Skill Interfaces

Junsheng Ding	Fortiss GmbH
Ingmar Kessler	Fortiss
Alexander Perzylo	Fortiss
Markus Knauer	German Aerospace Center (DLR)
Andreas Dömel	German Aerospace Center (DLR)
Christoph Willibald	German Aerospace Center (DLR)
Sebastian Riedel	Agile Robots SE
Stefan Profanter	Agile Robots SE
Sebastian Brunner	Agile Robots SE
Arsenii Dunaev	Agile Robots SE
Le Li	Agile Robots SE
Manuel Brucker	Agile Robots SE

16:30-16:45   **MoC07-3**

Semantic Annotation of System Models for Generating RDF Runtime Models

Christoph Klaassen	TU Wien Institute of Energy Systems and Thermodynamics
Max Thoma	TU Wien
Gernot Steindl	TU Wien
Amirali Amiri	Vienna University of Technology
Lukas Kasper	TU Wien Institute of Energy Systems and Thermodynamics
René Hofmann	TU Wien Institute of Energy Systems and Thermodynamics

16:45-17:00   **MoC07-4**

ST-Petri: A Visual Executable Semantic Model for PLC Structured Text Language

Xiaoyu Hu	Shanghai Jiao Tong University
Yonghui Liang	Shanghai Jiao Tong University
Shibo Zhu	Shanghai Jiao Tong University
Hui Li	Shanghai Jiao Tong University
Shanying Zhu	Shanghai Jiao Tong University

17:00-17:15   **MoC07-5**

V-AUTOSAR: Graphical Modeling Language for AUTOSAR Architecture and Resource Modeling

Yilong Yang	Beihang University
Yang Zhang	Beihang University
Hongliang Niu	Beihang University
Cangzhou Yuan	Beihang University
Li Qiangwei	Beihang University

17:15-17:30   **MoC07-6**

A Reliability Prediction Method for AutoSAR Architecture Considering Unreliable Platforms

Cangzhou Yuan	Beihang University
Hongliang Niu	Beihang University
Yang Zhang	Beihang University
YiLong Yang	Beihang University
Li Qiangwei	Beihang University

17:30-17:45   **MoC07-7**

Improved Classification of Motorcycle Rear Stroke Suspension Sensor Faults

Marco Carratu	University of Salerno
Valter Laino	University of Salerno
Antonio Pietrosanto	University of Salerno
Paolo Sommella	University of Salerno

17:45-18:00   **MoC07-8**

Self-Adaptive Reconstruction of Spacecraft Irregular Sampling Telemetry Data Based on Neural Ordinary Differential Equation

Yingqi Wang	Harbin Institute of Technology
Yuchen Song	Harbin Institute of Technology
Shengwei Meng	Harbin Institute of Technology
Datong Liu	Harbin Institute of Technology

Tuesday, Aug 20, 2024

TuA01: Transportation and Energy System Coupling in Industrial Informatics
Time: 9:00-11:00
Place: Huashan A

Chair:
Xiaolei Ma   Beihang University
Jiaming Zhou   Weifang University of Science and Technology

9:00-9:15   **TuA01-1**
Assessing the Impact of Pavement Material as Transmission Medium on the Interoperability of Magnetic Couplers for Inductive Electric Vehicle Charging
Yanjie Li   Beihang University
Siqi Zhou   Beihang University
Feng Li   Beihang University

9:15-9:30   **TuA01-2**
Multi-Objective Multi-Agent Reinforcement Learning for Energy-Aimed Train Scheduling for Urban Rail Transit Network
Xinyi Ning   Tsinghua University
Wei Dong   Tsinghua University
Yindong Ji   Tsinghua University
Xinya Sun   Tsinghua University

9:30 -9:45   **TuA01-3**
Optimal Design of Electric Bus Network Considering On-board Photovoltaic Power Supply
Xin Li   Dalian Maritime University
Chengdong Zhang   Dalian Maritime University
Yanhao Li   Dalian Maritime University
Yanxi Zhang   Dalian Maritime University
Yun Yuan   Dalian Maritime University

9:45 -10:00   **TuA01-4**
Heavy and Low-Speed Vehicle Traffic Impact Analysis on Cement Concrete Pavement Vibration
Pengpeng Li   National Center for Materials Service Safety, University of Science & Technology Beijing
Zhoujing Ye   National Center for Materials Service Safety, University of Science & Technology Beijing
Yue Hou   Department of Civil Engineering Swansea University
Songli Yang   School of Environmental, Civil, Agricultural and Mechanical Engineering University of Georgia

Linbing Wang   School of Environmental, Civil, Agricultural and Mechanical Engineering University of Georgia

10:00 -10:15   TuA01-5

Comparative Analysis of Advanced Optimization Algorithms for Highway Photovoltaic System Layout

Yanmeng Tao   Beihang University
Zhengke Liu   Beihang University
Wenxin Ma   Beihang University
Xiaolei Ma   Beihang University

10:15 -10:30   TuA01-6

An Improved Consistent Hashing-Based Data Indexing Method for Distributed Photovoltaic Stations on Highways

Zhu Wang   SANY Silicon Energy (Zhuzhou) Co., Ltd.
Tiejian Luo   University of Chinese Academy of Sciences

10:30 -10:45   TuA01-7

Operation Strategies for Modular Large-Scale Alkaline Electrolysis Systems

Hannes Lange   TUD Dresden University of Technology
Christopf Schirmer   TUD Dresden University of Technology
Michael Mock   TUD Dresden
Isabell Viedt   TUD Dresden University of Technology
Anselm Klose   TUD Dresden University of Technology
Leon Urbas   Technische Universität Dresden

10:45 -11:00   TuA01-8

Study on Heat Transfer and Flow Characteristics of Supercritical CO_2 of SLM Additive Manufacturing Heat Exchangers with Mini-Channels

Liu Dechao   Xi'an Jiaotong University
Chen Yuhao   Xi'an Jiaotong University
Xu Dongjun   Xi'an Jiaotong University
Ma Qiyuan   Xi'an Jiaotong University
Ma Ting   Xi'an Jiaotong University
Wang Chao   Tsinghua University

TuA02: Uncertainty Quantification and Mitigation for Sensing Planning and Control of Automated Driving
Time: 9:00-11:00
Place: Huashan B

Chair:

Fei Ding	Hunan University
Yafei Wang	Shanghai Jiao Tong University

9:00-9:15   TuA02-1

Visual-Based End-to-End Trajectory Forecasting: Exploring Synergy of Detection and Prediction

Xuanming Liu	Shanghai Jiao Tong University
Meng Yang	China National Heavy Duty Truck Group Co., Ltd.
Yafei Wang	Shanghai Jiao Tong University
Xulei Liu	Xihua University
Zexing Li	Shanghai Jiao Tong University
Ruoyao Li	Shanghai Jiao Tong University

9:15-9:30   TuA02-2

Integrated Positioning for Intelligent Vehicles Based on AEKF with Covariance Matching Principle and   Singular Spectrum Analysis

Dayu Li	Guilin University of Electronic Technology
Hui Jing	Guilin University of Electronic Technology
Ming Li	Guilin University of Electronic Technology
Huanqin Feng	Guilin University of Electronic Technology
Lei Zhang	Guilin University of Electronic Technology
Xiang Wang	Guilin University of Electronic Technology

9:30 -9:45   TuA02-3

Iterative Scenario Searching with PSO: Improving Simulation Efficiency for Autonomous Vehicle Testing

Yuqi Huang	China Automotive Engineering Research Institute Co., Ltd.
Xiaoji Zhou	China Automotive Engineering Research Institute Co., Ltd.
Deng Pan	China Automotive Engineering Research Institute Co., Ltd.
Qiang Zhang	China Automotive Engineering Research Institute Co., Ltd.
Jian Zhang	China Automotive Engineering Research Institute Co., Ltd.
Yufei Chen	China Automotive Engineering Research Institute Co., Ltd.
Chengjin Xiao	China Automotive Engineering Research Institute Co., Ltd.

9:45 -10:00   TuA02-4

DFT-Net:A Bimodal Object Detection Algorithm for Complex Traffic Environments

Jing Lian	Dalian University of Technology
Yibin Zhang	Dalian University of Technology

Haoyu Li   Dalian University of Technology
Jun Hu   Dalian University of Technology
Linhui Li   Dalian University of Technology

10:00 -10:15   TuA02-5

MPC-Based Trajectory Tracking Control for Independent Drive Vehicle with Differential Steering
Yifan Song   Guilin University of Electronic Technology
Hui Jing   Guilin University of Electronic Technology
Junhua Liu   Guilin University of Electronic Technology
Huanqin Feng   Guilin University of Electronic Technology
Zishan Lin   Guilin University of Electronic Technology
Ming Li   Guilin University of Electronic Technology

10:15 -10:30   TuA02-6

Research on Enhancing Feature Descriptors of ORB SLAM2 Algorithm Based on Lightweight Neural Network MLP+Transformer Algorithm
Ming Li   Guilin University Of Electronic Technology
Hui Jing   Guilin University Of Electronic Technology
Dayu Li   Guilin University Of Electronic Technology
Huanqin Feng   Guilin University Of Electronic Technology
Xiaoyuan Zhang   Guilin University Of Electronic Technology
Xiang Wang   Guilin University Of Electronic Technology

10:30 -10:45   TuA02-7

PGDepth: Roadside Long-Range Depth Estimation Guided by Priori Geometric Information
Wanrui Chen   Fudan University
Yu Sheng   University of Science and Technology of China
Hui Feng   Fudan University
Sheng Wu   Fudan University
Tao Yang   Fudan University

10:45 -11:00   TuA02-8

Fixed-Time Projective Synchronization of Multilayer Memristive Neural Networks Under Impulsive Deception Attack
Wenzhuo Li   Nanjing University of Science and Technology
Yijun Zhang   Nanjing University of Science and Technology

TuA03: Vehicles with New Configurations: Developments in Control and Observation Technologies
Time: 9:00-11:00
Place: Hengshan A

Chair:

Hui Jing	Guilin University of Electronic Technology
Xing Xu	Jiangsu University

9:00-9:15   TuA03-1
Adaptive Coordinated Rendezvous Control for UUV-ASV Heterogeneous Marine Vehicles

Huahuan Wang	Hainan University
Zehua Jia	Hainan University
Chen Zhang	Hainan University
Weidong Zhang	Hainan University

9:15-9:30   TuA03-2
Emergency Brake and DYC Coordinated Control Strategy Based on Model Predictive Control

Junhua Liu	Guilin University of Electronic Technology
Hui Jing	Guilin University of Electronic Technology
Rongrong Wang	Shanghai Jiao Tong University
Bing Kuang	Guilin University of Electronic Technology
Boyuan Li	Shanghai Jiao Tong University
Shaoxun Liu	Shanghai Jiao Tong University

9:30-9:45   TuA03-3
Towards Secure E-Mobility: Cybersecurity of In-Wheel Motor Electric Vehicles Against Adversarial Attacks via Detection and Mitigation

Mohamed Abdullah	Shanghai Jiao Tong University
Shaoxun Liu	Shanghai Jiao Tong University
Xi Zhang	Shanghai Jiao Tong University

9:45-10:00   TuA03-4
Dynamic Balancing Locomotion for Wheel-Legged Vehicle Navigating Uneven Terrain

Shiyu Zhou	Shanghai Jiao Tong University
Shaoxun Liu	Shanghai Jiao Tong University
Zheng Pan	Shanghai Jiao Tong University
Boyuan Li	Shanghai Jiao Tong University
Junhua Liu	Guilin University of Electronic Technology
Rongrong Wang	Shanghai Jiao Tong University

10:00-10:15   **TuA03-5**

Modeling and Analysis of Steering Characteristics for Wheel-Track Hybrid Vehicles

Boyuan Li	Shanghai Jiao Tong University
Junhua Liu	Guilin University of Electronic Technology
Zheng Pan	Shanghai Jiao Tong University
Yansong Zhang	Shanghai Jiao Tong University
Rongrong Wang	Shanghai Jiao Tong University

10:15-10:30   **TuA03-6**

Complex Road Recognition CNN Network Based on Multi-Label Learning

Haoxiang Gan	Nanjing University of Aeronautics and Astronautics
Han Zhang	Nanjing University of Aeronautics and Astronautics
Wanzhong Zhao	Nanjing University of Aeronautics and Astronautics
Yuhan Liu	Nanjing University of Aeronautics and Astronautics

10:30-10:45   **TuA03-7**

A Novel Cooperative Multi-Vehicle Planning Method Combining Group Benefit and Individual Preferences

Yuning Wang	Tsinghua University
Jinhao Li	Tsinghua University
Junkai Jiang	Tsinghua University
Shaobing Xu	Tsinghua University
John Dolan	Carnegie Mellon University
Jianqiang Wang	Tsinghua University

10:45-11:00   **TuA03-8**

Anomaly Detection and Fault Diagnosis Method for Autonomous Transport Vehicles on Unstructured Roads

Yifang Zhang	Beihang University
Guizhen Yu	Beihang University
Han Li	Beihang University
Chaoqi Zhang	Beihang University
Lecong Li	Beihang University
Chuanying Zhang	Beihang University

TuA04: AI-Empowered Decision Support System in Industrial 4.0
Time: 9:00-11:00
Place: Hengshan B

Chair:

Hao Wang	Xidian University
Yan Zhao	Xi'an Jiaotong-Liverpool University

9:00-9:15   TuA04-1

LB-KBQA: Large-Language-Model and BERT Based Knowledge-Based Question and Answering System

Yan Zhao	Xi'an Jiaotong-Liverpool University
Zhongyun Li	Xi'an Jiaotong-Liverpool University
Yushan Pan	Xi'an Jiaotong-Liverpool University
Jiaxing Wang	Xi'an Jiaotong-Liverpool University
Yihong Wang	Xi'an Jiaotong-Liverpool University

9:15-9:30   TuA04-2

A New Generation of Dynamic ORB-SLAM2 Algorithm Based on YOLO Object Detection

Yuyi Yang	Xi'an Jiaotong-Liverpool University
Chengtao Ji	Xi'an Jiaotong-Liverpool University
Nan Xiang	Xi'an Jiaotong-Liverpool University
Yihong Wang	Xi'an Jiaotong-Liverpool University
Jieming Ma	Xi'an Jiaotong-Liverpool University
Yushan Pan	Xi'an Jiaotong-Liverpool University

9:30-9:45   TuA04-3

A Rapid Fitting Method for the Estimation of Kinematic Errors in 3-RPR Robots Using Small Sample Sizes

Likang Song	Xi'an Jiaotong-Liverpool University
Yuqing Chen	Xi'an Jiaotong-Liverpool University
Min Chen	Xi'an Jiaotong-Liverpool University
Hongbin Zhang	Maxwell Technologies

9:45-10:00   TuA04-4

How Pretrained Foundation Models and Cloud-Fog Automation Empower the Recycling of Electrical Vehicles

Siyuan Liu	Xi'an Jiaotong-Liverpool University
Dapeng Lan	Chinese Academy of Sciences Shenyang
Jia Wang	Xi'an Jiaotong-Liverpool University
Honghao Lv	Zhejiang University
Zhibo Pang	KTH Royal Institute of Technology
Dongxiao Hu	Xi'an Jiaotong-Liverpool University

10:00-10:15   **TuA04-5**

A Vision-Based People Identification System Using Gait Recognition for Industrial Environments

Jason Peyron   University of Cape Town
Daniel Ramotsoela   University of Cape Town
Gerhard Hancke   City University of Hong Kong

10:15-10:30   **TuA04-6**

Development of Comprehensive Fertilizer Datasets: Enhancing Precision Agriculture through Data-Driven Insights

Nelson de de Traversi   Federal University of Rio Grande
Paulo Jefferson Dias de Oliveira   Federal University of Rio Grande
Evald
Juliana dos Santos   Center for Computational Sciences
Paulo Lilles Jorge Drews Junior   Federal University of Rio Grande
Silvia Botelho   Federal University of Rio Grande

10:30-10:45   **TuA04-7**

Multi-Sensor Information Optimal Fusion for Industry Application under Heavily-Constrained Communication

Xudong Zhao   Hangzhou Dianzi University
Yifang Shi   Hangzhou Dianzi University
Yuemin Ding   University of Navarra

10:45-11:00   **TuA04-8**

GRU-Attention Denosing Autoencoder Aided Fault Prognosis Method for System-Level Application

Haoxiang Gong   Beihang University
Yanfang Liu   Beihang University
Shumiao Zuo   Beihang University
Xiangyang Xu   Beihang University
Jiahui Du   Beihang University
Yongze Lang   Beihang University

TuA05: Intelligent Systems in Information and Control Technology

Time: 9:00-11:00
Place: Songshan A
Chair:

Xue Zhang	Shanghai Jiaotong University
Zeyang Yin	Central South University

9:00-9:15　TuA05-1

Prescribed Performance Control of Autonomous Mobile Robot with Hard and Soft Constraints Coordination Processing

Lei Cui	Central South University
Nan Qiao	Central South University
Ximiao Chen	Central South University
Jiajun Yan	Central South University
Yihe Zeng	Central South University
Zeyang Yin	Central South University

9:15-9:30　TuA05-2

Quadrotor UAV Trajectory Tracking Control Based on Improved ADRC Method

Haoyu Wu	Beijing Institute of Technology
Zhenhua Pan	Beijing Institute of Technology
Jie Li	Beijing Institute of Technology
Kewei Li	China Norinco UAV Research Institute co., Ltd
Dongyang Zhao	China Norinco UAV Research Institute co., Ltd

9:30-9:45　TuA05-3

Iterative Sequential Optimization for Coupled Position and Attitude Control of Quadrotors

Yuan Zang	Central South University
Zeyang Yin	Central South University
Kenan Yong	Nanjing University of Aeronautics and Astronautics
Caisheng Wei	Central South University

9:45-10:00　TuA05-4

An Improved Ultrasound High-Resolution Imaging Method Based on Spatially-Variant Model

Jie Gao	Harbin Institute of Technology
Yifei Chen	Harbin Institute of Technology
Xiangyu Li	Harbin Institute of Technology
Xin Zhang	Harbin Institute of Technology
Jian Liu	Harbin Institute of Technology
Yi Shen	Harbin Institute of Technology

10:00-10:15   **TuA05-5**

Real-Time Human Pose Estimation as a Cost-Effective Solution for the Teleoporation of a 6-Axis Cobot Arm

Benn Henderson	Ulster University
Sonya Coleman	Ulster University
Dermot Kerr	Ulster University
Justin Quinn	Ulster University
Shane Harrigan	Ulster University

10:15-10:30   **TuA05-6**

Comparison of Model Predictive Control and Proximal Policy Optimization for a 1-DOF Helicopter System

Georg Schäfer	Salzburg University of Applied Sciences
Jakob Rehrl	Salzburg University of Applied Sciences
Stefan Huber	Salzburg University of Applied Sciences
Simon Hirlaender	Paris Lodron University of Salzburg

10:30-10:45   **TuA05-7**

DCGAN-Based Augmentation for XGBoost Fault Modeling of On-Board Train Control System

Jinlan Wang	Guangzhou Railway Polytechnic
Yanchun Shen	Guangzhou Railway Polytechnic
Baigen Cai	Beijing Jiaotong University
Jiang Liu	Beijing Jiaotong University

10:45-11:00   **TuA05-8**

Distance-Based Cooperative Relative Localization for Multi-AUV Formation Control

Chuanhe Yu	Tangshan Port Group Co., Ltd
Haoyu Wang	Yanshan University

TuA06: Industrial Cyber Physical System
Time: 9:00-11:00
Place: Songshan B

Chair:

Xiaodong Shao	Beihang University
Chao Ning	Shanghai Jiao Tong University

9:00-9:15 TuA06-1

Tracking Differentiator-Based Multiview Dilated Characteristics for Time Series Classification

Changchun He	Harbin Institute of Technology
Xin Huo	Harbin Institute of Technology

9:15-9:30 TuA06-2

Energy-Efficient Safety-Aware Scheduling of Real-Time Control Systems with Burst Tasks

Ting Cheng	Shanghai Jiao Tong University
Yonghui Liang	Shanghai Jiao Tong University
Qimin Xu	Shanghai Jiao Tong University
Shanying Zhu	Shanghai Jiao Tong University

9:30-9:45 TuA06-3

Machine-Learning-Enabled Decision Support for Screwdriving Process

Zhenkai Yang	University of Twente
Poorya Ghafoorpoor Yazdi	University of Twente
Sebastian Thiede	University of Twente

9:45-10:00 TuA06-4

Framework for Faster-Than-Real-Time Testing of IEC 61499 Applications with Embedded Process Simulation

Valeriy Vyatkin	Aalto University
Roman Rumiantcev	Aalto University

10:00-10:15 TuA06-5

Optimal Planning of Multi-Energy Systems for Sustainable Ammonia Production Considering Electrothermal-Aging Effect of SOEC

Shuxian Liu	Shanghai Jiao Tong University
Longyan Li	Shanghai Jiao Tong University
Chao Ning	Shanghai Jiao Tong University

10:15-10:30 **TuA06-6**

Adaptive Control Strategy for Inertia and Damping Coefficients of Virtual Synchronous Generator

Jingyang Zhou	Southeast University
Kangli Liu	Southeast University
Jianfeng Zhao	Southeast University
Xiaogang Pan	Southeast University
Peng Chen	Southeast University

10:30-10:45 **TuA06-7**

Lightweight Driver and Window Detection Algorithm Based on Improved YOLOv5s

Yuan Liu	Qilu University of Technology
Zexin Xu	Qilu University of Technology
Chunqi Gao	Qilu University of Technology
Yong Wang	Qilu University of Technology

10:45-11:00 **TuA06-8**

A Two-Stage Multi-Population Co-Evolutionary Algorithm for Multi-Objective Optimal Power Flow

Yuming Ding	Huadian Electric Power Research Institute Co., Ltd
Xuechong Wu	Huadian Electric Power Research Institute Co., Ltd
Jing Xu	Huadian Electric Power Research Institute Co., Ltd
Weiqiang Xu	Huadian Electric Power Research Institute Co., Ltd
Zijun Que	Huzhou Institute of Zhejiang University
Jiamu Ling	Zhejiang University

TuA07: Research and Application of Non-Smooth Control
Time: 9:00-11:00
Place: Taihangshan

Chair:

Haibo Du	Hefei University of Technology
Junxiao Wang	Zhejiang University of Technology

9:00-9:15   TuA07-1

Torsional Vibration Suppression Method Design for Variable-Speed Wind Turbine Based on UIO-SMC

Jiajun Yu	Southeast University
Jinhui Xia	Southeast University
Jinya Su	Southeast University
Ze Li	Hebei University
Wentao Huang	Jiangnan University

9:15-9:30   TuA07-2

ALNS Framework for Platform-Based Vehicle Scheduling in Logistics Industrial Park CPSs

Botong Liu	JD Logistics
Yuqiao Wang	Southeast University
Yang Liu	JD Logistics
Wenming Zhe	JD Logistics
Yan Cheng	JD Logistics

9:30-9:45   TuA07-3

Steganographic Encryption and Decryption Using Duality Preserving GANs

Aaryak Shah	ABV-IIITM Gwalior
Alok kumar Kamal	ABV-IIITM Gwalior
Neeraj Choudhary	Mahindra University

9:45-10:00   TuA07-4

Far vs. Near: A Decision Framework for Cloud and Edge Use in the Process Industry

Lucas Vogt	TU Dresden
Zohra Charania	Chair of Process Control Systems, TU Dresden
Leon Urbas	Technische Universität Dresden

10:00-10:15   **TuA07-5**

Adaptive SOSM Controller Design Based on a Fixed-Time ESO for PMSM Speed Drives

Yincong Hu	Jiangsu University
Lu Liu	Jiangsu University
Shihong Ding	Jiangsu University
Yonggui Zha	Zhejiang Zhenghao Refractory Materials Co., Ltd
Yongqi Jiang	Zhejiang Zhenghao Refractory Materials Co., Ltd

10:15-10:30   **TuA07-6**

Second-Order Non-Smooth Control System Under Denial-of-Service Attack

Weile Chen	Southeast University
Haibo Du	Hefei University of Technology
Shihua Li	Southeast University

10:30-10:45   **TuA07-7**

Sampled-Data Control for Second-Order Linearly Uncontrollable/Unobservable Time-Delayed Systems

Xin Wang	Jiangsu Univerisity
Shihong Ding	Jiangsu Univerisity
Keqi Mei	Jiangsu Univerisity
Wenhui Dou	Jiangsu Univerisity
Yiqing Ma	Jiangsu Univerisity
Chen Ding	Jiangsu Univerisity

10:45-11:00   **TuA07-8**

Fixed-Time Prescribed Performance Sliding Mode Control for Magnetic Levitation Systems with Mismatched Multiple Disturbances

Qinchen Jiang	Zhejiang University of Technology
Junxiao Wang	Zhejiang University of Technology

Poster Session TuA08
Time: 9:00-11:00
Place: Ramada Beijing North Hotel Lobby

TuA08-1
Artificial Neural Network for Disaggregation of Behind-the-Meter Energy Consumption and Generation

Nameer Al Khafaf	RMIT University
Brendan McGrath	RMIT University
Syed Muhammad Nawazish Ali	RMIT University
Mahdi Jalili	RMIT University

TuA08-2
Combined Lateral-Longitudinal Vehicle Trajectory Tracking Control Based on Model Predictive Control and Fractional-Order PI

Keyong Shao	Northeast Petroleum University
Feiyu Pan	Northeast Petroleum University
Na Yi	Northeast Petroleum University
Yang Han	Northeast Petroleum University

TuA08-3
Stacked Transformer Models for Enhanced Wind Speed Prediction in the Red Sea

Mazen Hittawe	KAUST
Fouzi Harrou	KAUST

TuA08-4
The Deployment of Microservice at Edge Based on MQTT for Low Latency

Mengqi Han	SJTU
Bo Yang	SJTU
Yuxiang Liu	SJTU
Sicheng Liu	SJTU
Qi Liu	SJTU

TuA08-5
Model Predictive Speed Control for PMSM Drive Systems Based on a Second-Order Current Model

Han Zhang	University of Jinan
Zhonghua Wang	University of Jinan
Dongxue Wang	University of Jinan

TuA08-6

Research on Generator Torque Fault Determination of Wind Turbines Based on Digital Twin

Yanping Li	Yangjiang Power Supply Bureau of Guangdong Power Grid
Xiaoqiang Peng	Yangjiang Power Supply Bureau of Guangdong Power Grid
Yanni Kou	Yangjiang Power Supply Bureau of Guangdong Power Grid
Kang Li	Jinan University
Qi Yao	Jinan University

TuA08-7

Research on Diesel Consumption Prediction and Early Warning Analysis of Dump Trucks in Smart Mines

Weiwei Qin	SPIC Central Research Institute
LongBin Li	SPIC Central Research Institute
Xingyu Wei	SPIC Central Research Institute
Yulong Li	SPIC Central Research Institute
Weiqian Dong	SPIC Central Research Institute

TuA08-8

A Cross Working Conditions Mechanical Diagnosis Method Based on Improved Adversarial Transfer Learning

Jingli Yang	Harbin Institute of Technology
Changdong Wang	Harbin Institute of Technology
Wenmin Wang	Beijing Institude of Control and Electronic Technology

TuA08-9

Design of a Control System Based on a Graphical Programming Algorithm for UAV Attitude Control Platform

Yongkang Jiao	Naval Aviation University
Qiangqing Su	Unit 91811
Yanqin Su	Naval Aviation University
Doudou Huang	Unit 92781
Fanzeng Wu	Hefei University of Technology

TuA08-10

Design of Attitude Simulation Control Platform for UAV Teaching

Yongkang Jiao	Naval Aviation University
Xiao Han	The equipment Support Group of the Naval Armament Department
Doudou Huang	Unit 92781
Lei Li	Hefei University of Technology

TuA08-11

State of Power Estimation of Lithium-ion Battery Based on Extended Kalman Filter

Yue Zheng	Beihang University
Zhengjie Zhang	Beihang University
Rui Cao	Beihang University
Yuntao Jin	Beihang University
Haobo zhang	Beihang University
Shichun Yang	Beihang University

TuA08-12

A Vision-based Bird's Eye View Representation Network for 3D Objects in Open-pit Mining Area

Mengen Tai	Beihang University
Wentao Liu	Beihang University
Zhangyu Wang	Beihang University
Bin Zhou	Beihang University
Guizhen Yu	Beihang University
Songyue Yang	Beihang University

TuA08-13

A Condition Monitoring Method for Industrial Dynamic Processes Based on MSET

Gaochao Wu	Zhejiang University
Shimin Qu	Inner Mongolia Huomei Hongjun Aluminum Power Co., Ltd.
Ziqi Wang	Zhejiang University
Zijun Que	Zhejiang University

TuA08-14

Defect Prediction in Directed Energy Deposition Using an Ensemble of Clustering Models

Shawqi Mohammed Othman Farea	Sabanci University
Mustafa Unel	Sabanci University
Bahattin Koc	Sabanci University

TuA08-15

Prediction of Failures in Air Pressure System: A Semi-supervised Framework Based on Transformers

Shawqi Mohammed Othman Farea	Sabanci University
Mehmet Emin Mumcuoglu	Sabanci University
Mustafa Unel	Sabanci University
Serdar Mise	Ford Otosan

Simge Unsal	Ford Otosan
Enes Cevik	Ford Otosan
Metin Yilmaz	Ford Otosan
Kerem Koprubasi	Ford Otosan

TuA08-16

Position-Based Impedance Control for Trailing-Arm Suspension Vehicles: Enhancing Ride Comfort and Posture Stability

Zheng Pan	Shanghai Jiao Tong University
Shiyu Zhou	Shanghai Jiao Tong University
Jun He	Shanghai Jiao Tong University
Boyuan Li	Shanghai Jiao Tong University
Shouyuan Chen	Shanghai Jiao Tong University
Rongrong Wang	Shanghai Jiao Tong University

TuA08-17

Robust Data-EnablEd Predictive Leading Cruise Control via Reachability Analysis

Shuai Li	Tsinghua University
Chaoyi Chen	Tsinghua University
Haotian Zheng	Tsinghua University
Jiawei Wang	Tsinghua University
Qing Xu	Tsinghua University
Keqiang Li	Tsinghua University

TuA08-18

A Multi-source Domain Generalization Network for Rotating Machinery Fault Diagnosis under Unseen Operating Conditions

Tianyu Gao	Harbin Institute of Technology
Jingli Yang	Harbin Institute of Technology
Xiaopeng Fan	Harbin Institute of Technology
Weiwei Hao	China Institute of Marine Technology and Economy

TuA08-19

CLLA: A Fault Diagnosis Method for Abnormal Fluctuation of Rolling Force in Hot Continuous Rolling System

Xu Xinkai	Automation Research and Design Institute of Metallurgical Industry Co., Ltd. Central Iron & Steel Research Institute
Sun Chenxi	China Iron and Steel Research Institute Technology Group Co.
Chen Xuejiao	Automation Research and Design Institute of Metallurgical Industry

| Qi Zheng | China Iron and Steel Research Institute Technology Group Co. |

TuA08-20
Value Conditional State Entropy Reinforcement Learning for Autonomous Driving Decision Making

Yiyi Han	Tongji University
Lulu Guo	Tongji University
Hong Chen	Tongji University

TuA08-21
Adaptive Control for Spacecraft Proximity Operations under Motion Constraints

Bin Chen	Beihang University
Haoran Li	Beihang University
Xiaodong Shao	Beihang University
Yongxia Shi	Nanyang Technological University
Qinglei Hu	Beihang University

TuA08-22
Prediction of SiC MOSFET Power Modules Junction Temperature for Electric Vehicle Based on Electro-Thermal Coupled Model

Xiao Chen	Jiangsu University
Xing Xu	Jiangsu University
Meng Li	Jiangsu University
Yong Li	Jiangsu University
Heping Ling	Automotive Engineering Research Institute, BYD Company

TuA08-23
EMDT: A Decision Transformer-Based Energy Management Strategy in Integrated Energy Systems

Ziyue Li	State Grid Integrated Energy Services Group Co., Ltd.
Jiancheng Chen	Beihang University
Jianzhi Xu	North China Electric Power University

TuA08-24
An Improved Memetic Algorithm for Ship Pipe Shop Scheduling with Multi-Production Lines

Xuchao Wang	Wuhan University of Technology
Sisi Tian	Wuhan University of Technology
Wenjun Xu	Wuhan University of Technology
Ruifang Li	Wuhan University of Technology

TuA08-25

Expansion Planning Method of Park-Level Integrated Energy System Considering Resilience Constraints

Enzhen Wang	Beijing Jingneng Distributed Energy Technology Co., Ltd
Yun Zhou	Beijing Jingneng Distributed Energy Technology Co., Ltd
Yeguo He	Beijing Jingneng Distributed Energy Technology Co., Ltd
Yining Li	North China Electric Power University
Songyuan Yu	North China Electric Power University

TuA08-26

Study of Local Trajectory Planning Based on Fuzzy Dubins Risk Field

Shaohua Li	SKL of TES, Shijiazhuang Tiedao University
Boyu Ma	SKL of TES, Shijiazhuang Tiedao University
Zekun Yang	SKL of TES, Shijiazhuang Tiedao University
Xuewei Wang	SKL of TES, Shijiazhuang Tiedao University

TuA08-27

Towards Robot Software Abstraction: ROS 2-Based Framework for Object Handling within a Robot Cell

Mikel Bueno Viso	Cranfield University
Jingjing Huang	Cranfield University
Seemal Asif	Cranfield University
Fahad Khan	Cranfield University
Phil Webb	Cranfield University

TuA08-28

Adversarial Domain Adaptation for Metal Cutting Sound Detection: Leveraging Abundant Lab Data for Scarce Industry Data

Mir Imtiaz Mostafiz	Purdue University
Eunseob Kim	Purdue University
Adrian Shuai Li	Purdue University
Elisa Bertino	Purdue University
Martin Byung-Guk Jun	Purdue University
Ali Shakouri	Purdue University

TuA08-29

Hybrid Fine-Tuning in Large Language Model Learning for Machinery Fault Diagnosis

Zhendong Pang	Shandong University
Hao Zhang	Shandong University
Teng Li	Shandong University

TuA08-30

Incremental Learning Strategy with Multi-dimensional Knowledge Distillation for One-stage Object Detection

Yimeng Li	Beijing Institute of Technology
Xuejiao Liu	China Academy of Space Technology
Xueshuang Xiang	China Academy of Space Technology
Yu-an Tan	Beijing Institute of Technology
Weizhi Meng	Technical University of Denmark

TuA08-31

TinyMLEdge: A Workflow for Deploying TinyML Models in Industrial Edge Devices

Feng Xu	Technical University of Munich

TuA08-32

Simulation Validation of Megawatt-scale Charging Interface Thermal Management Based on ACN-Sim

Yang Hang	State Grid (Beijing) Electric Vehicle Service Company LTD
Lingxiao Wei	State Grid (Beijing) Electric Vehicle Service Company LTD
Xiaoqi Shao	China Electric Power Research Institute Company LTD
Xudong Jia	State Grid (Beijing) Electric Vehicle Service Company LTD
Heyong Zhao	State Grid (Beijing) Electric Vehicle Service Company LTD
Yanmei Tang	China Electric Power Research Institute Company LTD

TuA08-33

Distributed Unscented Estimation of Multi-agent Systems with Homologous Unknown Inputs

Changqing Liu	China Electric Power Research Institute

TuA08-34

Event-triggered Nonfragile State Estimator Design for Two-Dimensional Discrete Systems Modeled by the Fornasini-Marchesini Second (FM-II) Model under Bounded Disturbances

Yahui Wang	University of Jinan
Yueyang Li	University of Jinan
Qin Zhang	Univeristy of Jinan

TuA08-35

Self-Attention Transformer for Remaining Useful Life Prediction in Lithium-Ion Batteries

Shurong Zhang	University of Jinan
Yueyang Li	University of Jinan
Qin Zhang	University of Jinan

TuA08-36

Industrial Internet Evaluation Architecture Based on Platform-Enterprise Dual Perspective

Mengjin Qu	Tsinghua University
Shihong Li	Tsinghua University
Jun Li	Tsinghua University
Shijie Zhou	Tsinghua University
Qing Li	Tsinghua University

TuA08-37

Research on Volume Estimation Method Based on Three-dimensional Point Cloud

Huijie Wang	Electricity Facilities Guangri Guangzhou Co., Ltd. Beihang University
Zhifeng Sun	Electricity Facilities Guangri Guangzhou Co., Ltd.
Miao Liu	Cestera Motor Co., Ltd
Jinyu Han	Cestera Motor Co., Ltd
Tao Wang	Cestera Motor Co., Ltd

TuA08-38

EncodedRL: Solving the Dynamic Scheduling Problem using Multi-Agent Reinforcement Learning Based on an Encoded State Representation

David Heik	Dresden University of Applied Sciences
Fouad Bahrpeyma	Dresden University of Applied Sciences
Johannes Metzler	Dresden University of Applied Sciences
Dirk Reichelt	HTW Dresden

TuA08-39

Construction of Data-driven Model of PMSM for Stator and Rotor Temperature Prediction

Hanyang Chen	JiangSu University
Liqin Sun	JiangSu University
Heping Ling	BYD company

TuA08-40

A Trajectory Planning Method for Dynamic Target Tracking Based on Differential Evolution

Li Chenzhihang	Beijing Institute of Technology
Deng Hongbin	Beijing Institute of Technology
Wu Junqi	Beijing Institute of Technology
Pan Zhenhua	Beijing Institute of Technology

TuA08-41

Application of Inhomogeneous QMIX in Various Architectures to Solve Dynamic Scheduling in Manufacturing Environments

David Heik	Dresden University of Applied Sciences
Alexander Böhm	Dresden University of Applied Sciences
Fouad Bahrpeyma	Dresden University of Applied Sciences
Dirk Reichelt	HTW Dresden

TuA08-42

Smooth Transition Switching Strategy for Sensorless Control of PMSM with Extended State Observer and Phase-Locked Loop

Dawei Qi	University of Jinan
Dongxue Wang	University of Jinan
Guangming Wu	University of Jinan

TuA08-43

Human Factors-Based Evaluation System for Urban Roadway Lighting: A New Evaluation Technology Path

Quan Chen	Southeast University
Yuzhen Qiu	Southeast University
Jinchun Wu	Southeast University

TuA08-44

A Novel Integrated Decision-making Evaluation Method Considering Individual Personalization Diversity

Yuning Wang	Tsinghua University
Zehong Ke	Tsinghua University
Yanbo Jiang	Tsinghua University
Shaobing Xu	Tsinghua University
John Dolan	Carnegie Mellon University
Jianqiang Wang	Tsinghua University

TuA08-45

A Simultaneous Color Comparison Study of Yellow and Amber in Cockpit Screen Color

Jinwen Wang	Southeast University
Jinchun Wu	Southeast University
Chengqi Xue	Southeast University

TuA08-46

Prescribed Tracking Performance Fixed Time Sliding Mode Control for Autonomous Vehicle with RBFNN Approximated Uncertainty

Ruoyan Dong	Research Institute of HNU in Chongqing
Liu Jie	Research Institute of HNU in Chongqing
Fei Ding	Research Institute of HNU in Chongqing
Wei Ding	Research Institute of HNU in Chongqing

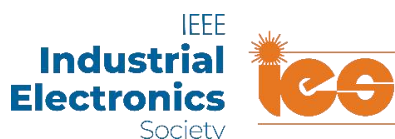## TuA08-47

12-Phase Virtual Synchronous Generator

Hang Yin	Naval Submarin Academy
Zongliang Wang	Naval Submarin Academy
Junzhong Sun	Naval Submarin Academy

13. Special Thanks to Sponsers

Industrial Electronics Society

The Industrial Electronics Society through its members encompasses a diverse range of technical activities devoted to the application of electronics and electrical sciences for the enhancement of industrial and manufacturing processes. These technical activities address the latest developments in intelligent and computer control systems, robotics, factory communications and automation, flexible manufacturing, data acquisition and signal processing, vision systems, and power electronics. The society continually updates its program of technical activities to meet the needs of modern industry. The Field of Interest of the IES shall be confined to the theory and applications of electronics, controls, communications, instrumentation, and computational intelligence to industrial and manufacturing systems and processes. The vision of the IES is to advance global prosperity by fostering technological innovation, enabling members' careers and promoting community worldwide. The IES promotes the engineering process of creating, developing, integrating, sharing, and applying knowledge about electro- and information technologies and sciences for the benefit of humanity and the profession.
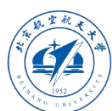
Beihang University

Beihang University is a leading public research institution in China, specializing in engineering, technology, and the hard sciences. Established in 1952, it has grown into a multidisciplinary university with strengths in aerospace, mechanical engineering, computer science, and more. Located in Beijing, the university boasts a comprehensive educational framework, offering a wide range of undergraduate, master's, and doctoral programs. It is renowned for its research contributions and innovation, holding numerous national key laboratories and research centers. Beihang University maintains strong international collaborations and is dedicated to cultivating top-tier talent, making significant contributions to both national and global scientific advancements.

North China Electric Power University

North China Electric Power University (NCEPU) was founded in 1958 in Beijing, and was affiliated to the national power department. It has 11 schools and 59 undergraduate majors, forming a complete system to train undergraduates, master's students, and doctoral candidates. The university has achieved great progress in the fields such as new energy power generation, ultra-high voltage, smart grid, efficient clean coal-fired generation technology, and nuclear power technology, etc. The university has been engaged in the internationalized education, and developed substantive communication and cooperation with about 140 internationally well-known universities and research institutes. As the leading university in the field of electricity power, NCEPU actively cultivate top-level innovative talents, create high-level scientific research achievements, and provide first-class service for the country and society.

Beijing Institute of Technology

Beijing Institute of Technology (BIT) was originally founded in Yan'an in 1940, and moved to Beijing in 1949. BIT maintains an edge in intelligent and bionic robotics, space adaptive optics, green energy, modern communications, and industrial process control. It has six national teaching teams and three national experimental teaching centers, aiming to develop students into leaders with ambition, wisdom, innovation, and a sense of duty. BIT adheres to the principles of integration and mutual benefit with global partners. Through cooperation, it has formed an international friendship network. It has signed cooperation agreements with over 400 universities in 78 countries and regions across six continents, and established various exchange and cooperation programs for teachers and students with world-class institutions.

Jiangsu Association of Automation, JSAA

The Jiangsu Association of Automation is a non-profit organization composed of scientific and technological workers engaged in the research, teaching, development, production, and application of automation science and related technologies. Established on November 28, 1978, the association is currently affiliated with Southeast University. It has over 5,000 members, including 1,100 with senior professional titles, and 34 governing units and 9 member units. The association has been rated as a 4A social organization by the provincial civil affairs department and as an "Advanced Collective" by the Chinese Association of Automation.

The association has 7 working committees and 12 specialized committees, covering fields such as control theory and applications, industrial automation, smart cities, etc., providing academic activities, scientific and technological services, popular science services, talent recommendation, and decision-making consultation. The current president is Professor Li Shihua from Southeast University.

Shaoxing University

Shaoxing University, a multidisciplinary institution approved by China's Ministry of Education, traces its roots back to 1909. Located in the historically significant city of Shaoxing, the university encompasses four campuses and offers 63 undergraduate programs across nine academic disciplines, with over 15,000 full-time students. It has a strong emphasis on application-oriented education, boasting numerous provincial and national accolades. The university fosters innovation and entrepreneurship, with significant achievements in scientific research and international cooperation, partnering with over 60 institutions globally. With a dedicated faculty of over 1,100 teachers, Shaoxing University is committed to cultivating high-quality talents and aims to become a distinguished application-oriented university.

14. Dinning, Award Ceremony, and Banquet

Time	Contents	Place
18:30-20:00 Aug. 17	Welcome Dinner	Wyndham Beijing North Hotel F1 Bravo Italian Restaurant/Palm Terrace
12:30-13:30 Aug. 18	Buffet Lunch	Wyndham Beijing North Hotel F1 Bravo Italian Restaurant/Palm Terrace
18:30-20:30 Aug. 18	Banquet Award Ceremony	Wyndham Beijing North Hotel F2 Beijing Ballroom
12:30-13:30 Aug. 19	Buffet Lunch	Wyndham Beijing North Hotel F1 Bravo Italian Restaurant/Palm Terrace
18:30-20:30 Aug. 19	Buffet Dinner	Wyndham Beijing North Hotel F1 Bravo Italian Restaurant/Palm Terrace
20:30-22:30 Aug. 19	Social Event	Wyndham Beijing North Hotel F1 Garden
12:30-13:30 Aug. 20	Buffet Lunch	Wyndham Beijing North Hotel F1 Bravo Italian Restaurant/Palm Terrace

15. Miscellaneous

15.1 Delegate Name Badge
Delegates shall wear IEEE INDIN 2024 badge to participate all the activities of the conference, and please keep it properly.

15.2 Duplication, Fax, and Telephone Service
The hotel business center will provide paid duplication and fax service.
Hotel Tel: 010-80799988

15.3 Medical Consultation
The committee provide simple and urgent medical consultation and health care at the registration desk (1st Floor, Lobby of Wyndham Beijing North Hotel Conference Center).
Service line: 010-80799988