



2023 9th International Conference on Control, Automation and Robotics

2023 年第九届控制、自动化和机器人国际会议

Beijing, China | April 21-23, 2023

中国, 北京 | 2023 年 4 月 21-23 日

Co-sponsored by



北京航空航天大学
BEIHANG UNIVERSITY



Hosted by



北航 交通科学与工程学院
School of Transportation Science and Engineering BUAA

Supported by



Osaka
Metropolitan
University



PONTIFICIA
UNIVERSIDAD
CATÓLICA
DEL PERÚ

Table of Contents

目录

Welcome Message	2
Conference Schedule	3
Session Information	5
Local Information	6
Online Guideline	7
Organizing Committees	8
Conference Speakers	11

Apr. 22nd Onsite Conference

Special Session 1A.....	19	Special Session 3A.....	20
Special Session 4A	21	Special Session 5.....	32
Special Session 6.....	23	Session 7.....	24

Apr. 23rd Online Conference

Special Session 1B	26	Special Session 2.....	27
Special Session 1C.....	28	Special Session 3B	29
Special Session 4B.....	30	Session 8	31
Closing & Awards	32		
Presenters Index	33		

Welcome Message

欢迎辞

On behalf of the conference committees, we are pleased to welcome you to 2023 9th International Conference on Control, Automation and Robotics (ICCAR), which will be held in Beijing, China on April 21-23, 2023. ICCAR 2023 is co-sponsored by Beihang University (China) and IEEE, hosted by School of Transportation Science and Engineering BUAA (China), supported by Tsinghua University (China), Beijing Institute of Technology (China), University of Science and Technology Beijing (China), Nankai University (China), Osaka Metropolitan University (Japan), Pontifical Catholic University of Peru (Peru), Politecnico di Milano (Italy), etc. We would like to invite you to participate in this international conference, to share your latest research findings, innovations, and ideas in the fields of control, automation and robotics.

ICCAR 2023 will provide a unique platform for attendees to explore current and emerging trends in these fields, as well as network with other like-minded individuals and organizations. The conference program will include keynote speeches, technical presentations, and interactive workshops covering topics such as intelligent systems, machine learning and computer vision, mechatronics, robotics and automation, and control and optimization.

It's our great pleasure to invite 7 prestigious experts and professors to deliver the latest information in their respective expertise areas, they are:

Prof. Yuanqing Xia, Beijing Institute of Technology, China

Prof. Yan Shi, Beihang University, China

Prof. Degang Xu, Central South University, China

Prof. Cailian Chen, Shanghai Jiao Tong University, China

Prof. Yan-Wu Wang, Huazhong University of Science & Technology, China

Prof. Jing Liang, Zhengzhou University, China

Prof. Hao Zhang, Tongji University, China

We'd like to express our sincere gratitude to everyone who has contributed to ICCAR 2023 as its success could have only been achieved through a team effort. Additionally, our thanks go to all the conference committees, for putting the conference together; as well as to all the technical committee members and reviewers for their excellent work in reviewing the papers and their other academic support efforts. Finally, we are particularly grateful to all the authors and presenters of the papers as well as all the attendees for their contributions to this wonderful conference.

Finally, we hope you have a fruitful and memorable experience at ICCAR 2023!

With Warmest Regards,
Conference Organizing Committees

Conference Schedule

会议日程

April 21st (Friday, GMT+8) | 4月21日 (周五)

Onsite Meeting 北京线下会议签到		
10:00-17:00	Registration & Collecting Conference Material 1 楼酒店大厅	
Online Meeting Test 线上会议测试		
Zoom Link	ZOOM ID: 85074691857 https://us02web.zoom.us/j/85074691857	ZOOM: 89512386100 https://us02web.zoom.us/j/89512386100
10:00-12:00	Special Session 1B, 1C, 4B	Special Session 2, 3B, Session 8
Zoom Link	Zoom ID: 850 7469 1857 https://us02web.zoom.us/j/85074691857	
15:00-16:00	Conference Speakers, Session Chairs	

April 22nd (Saturday, GMT+8) | 4月22日 (周六)

Room			The 16th Conference Room (B1 Floor) B1 层第十六会议室		
Zoom		Zoom ID: 850 7469 1857		Link: https://us02web.zoom.us/j/85074691857	
Speech Host		Prof. Hui Zhang, Beihang University, China			
09:30-09:40	Opening Remarks	<i>Prof. Shichun Yang</i> , Beihang University, China			
		Dean of School of Transportation Science and Engineering, BUAA			
		<i>Prof. Luyuan Wang</i> , China Academy of Space Technology, Beijing Institute of Spacecraft System Engineering			
09:40-10:10	Invited Talk	<i>Prof. Yuanqing Xia</i> , Beijing Institute of Technology, China Speech title: Workflow Scheduling in Cloud Control Systems			
10:10-10:40	Invited Talk	<i>Prof. Yan Shi</i> , Beihang University, China Speech title: Pressure Control Study on Mechanical Ventilation Based on Adaptive Fuzzy-PID Compensation			
10:40-11:20		Group Photo & Coffee Break			
11:20-11:50	Invited Talk	<i>Prof. Degang Xu</i> , Central South University, China Speech title: Intelligent Perception and Precise Control Method of Slag Removal Robot for Non-Ferrous Metal Casting Process			
12:00-14:00		Lunch Time			
Room		第十六会议室		第八会议室	
14:00-15:30	Special Session 1A RA0236, RA0281A, RA0282A RA0318, RA0400, RA0402		Special Session 3A RA0261, RA0215 RA0398, RA0267, RA0228		Special Session 4A RA0248, RA0220, RA0264 RA0310, RA0317A, RA0278A RA0249
15:30-16:00		Coffee Break			
16:00-17:30	Special Session 5 RA0243, RA0397, RA0336 RA0263, RA0274		Special Session 6 RA0269, RA0233, RA0410 RA0412, RA0294, RA0321		Session 7 RA0381, RA0315, RA0330 RA0360, RA0375, RA0358
17:30-19:00		Conference Dinner			

April 23rd (Sunday, GMT+8) | 4 月 23 日 (周日)

Women in Control, Automation and Robotics (CAR) -女性学者专场		
	Zoom ID: 850 7469 1857 Link: https://us02web.zoom.us/j/85074691857	
09:30-09:35	Welcome & Host	<i>Prof. Lu Liu</i> , City University of Hong Kong, China
09:35-10:05	Invited Talk	<i>Prof. Cailian Chen</i> , Shanghai Jiao Tong University, China Speech title: Heterogeneous Data Deterministic Transmission for Factory Automation
10:05-10:35	Invited Talk	<i>Prof. Yan-Wu Wang</i> , Huazhong University of Science and Technology, China Speech title: Cooperative Control in DC Microgrid: Voltage Regulation and Current Sharing
10:35-10:45	Coffee Break	
10:45-11:15	Invited Talk	<i>Prof. Jing Liang</i> , Zhengzhou University, China Speech title: Evolutionary Constrained Multiobjective Optimization
11:15-11:45	Invited Talk	<i>Prof. Hao Zhang</i> , Tongji University, China Speech title: Multi-agent Formation Navigation in a Feasible Space-constrained Environment
12:00-13:30	Lunch Break	
Online Parallel Sessions-线上平行会场		
	Zoom ID: 860 1556 7851 Link: https://us02web.zoom.us/j/86015567851	Zoom ID: 831 9464 1295 Link: https://us02web.zoom.us/j/83194641295
13:00-14:30	Special Session 1B RA0335, RA0142, RA0250 RA0298, RA0240, RA0299	Special Session 2 RA0365, RA0132, RA0270 RA0371, RA0277, RA0339
	Zoom ID: 850 7469 1857 Link: https://us02web.zoom.us/j/85074691857	Zoom ID: 895 1238 6100 Link: https://us02web.zoom.us/j/89512386100
13:30-15:15	Special Session 1C RA0272, RA001, RA0043 RA0285, RA0369, RA0392, RA0399	Special Session 3B RA0356, RA0414, RA0396, RA0383 RA0291, RA0300, RA0245, RA0211
15:15-15:45	Coffee Break	
15:45-17:30	Special Session 4B RA0280, RA0287, RA0219 RA0254, RA0372, RA0122, RA0406	Session 8 RA0062, RA0380, RA0295 RA0072, RA0224, RA0112
	Zoom ID: 850 7469 1857 Link: https://us02web.zoom.us/j/85074691857	
18:00-18:20	Closing Ceremony & Awards 闭幕式 & 会议颁奖（线上）	

Session Information

分会概览

Special Session 1

Control of Advanced Robotic and Mechatronic Systems

先进机器人及机电系统控制

Special Session 2

Intelligent and Sustainable Solutions for Liveable Cities

宜居城市的智能和可持续解决方案

Special Session 3

Autonomous Safety Control in Aerospace Applications

航空航天领域中的自主安全控制

Special Session 4

Intelligent Perception and Control of Networked Motion Control Systems

网络化运动控制系统智能感知与控制

Special Session 5

Advanced Fluid Power Transmission and Control

先进流体传动与控制

Special Session 6

Space Intelligence Dexterous Operation

空间智能灵巧操作

Session 7

Object Detection and Machine Vision

物体检测与机器视觉

Session 8

The Application of Intelligent Image Processing in Modern Electronic Information Systems

智能图像处理在现代电子信息系统中的应用

Local Information

会场须知



北京京仪大酒店

地址：北京海淀区大钟寺东路 9 号

(毗邻中坤广场和体育大学地铁 13 号 10 号知春路站 B 出口，紧邻北三环联想桥、大钟寺)

签到地点 | 酒店 1 楼大厅

会场注意事项

1	注意安全防范, 妥善保管好个人财物、资料, 休息或离开房间时务必锁好房门
2	请各位嘉宾根据日程安排按顺序报告, 并关注临时通知
3	会场多媒体设备由会务组统一提供, 报告者可通过拷入 U 盘的方式, 提前备好演讲文稿电子版 (PPT/PDF) 用于测试、报告等; 每位演讲者报告时长包括演讲和提问交流时间
4	本次会议凭借胸卡进入会场, 凭餐券用餐, 请随身携带
5	遵守会场秩序, 会议开始前请将手机调至静音, 保持会场安静

乘车指南

地铁线路	地铁 10 号线、13 号线知春路站下, B 口出, 向西 100 米, 见到路口后左拐 (向南拐), 步行 5 分钟即到, 位于马路西侧
公交线路	乘坐 361 路、323 快、425 路、87 路、88 路、718 路、特 8 路、运通 101 路、运通 201 路, 在大钟寺站下车, 向东北方向走 200 米即到, 马路西侧
自驾车线路	由西向东方向, 北三环四通桥出口出, 由东向西方向, 蓟门桥出口出, 辅路行至联想东桥后, 向北 500 米即到
北京首都国际机场	从首都机场乘坐地铁机场线在三元桥站下车, 换乘地铁 10 号线在知春路站下车, 向南步行 5 分钟到达京仪大酒店
北京火车站	从北京站出发乘坐地铁 2 号线(内环), 西直门站下车, 下车步行约 200 米, 换乘地铁 13 号线(西直门-东直门), 在知春路站下车 向南步行 5 分钟到达京仪大酒店
北京西客站	从北京西客站乘坐 695 路公交汽车, 在北京西站 上车, 至 大钟寺 站下车, 步行约 100 米到达京仪大酒店

Online Guideline

线上会议须知

Test before Formal Meeting 会前设备测试

Date: 21st April

Before the formal meeting, presenters shall join the test room to ensure everything is good.

Time Zone 时区

Beijing Time (GMT+8)

You're suggested to set up the time on your laptop in advance.

Equipment & Environment Needed 报告环境须知

- A laptop with stable internet connection and camera
- Headphones
- A quiet place
- Proper lighting and background

Software 会议软件



ZOOM Download:

- <https://zoom.us/download>
- For Chinese Users: <https://zoom.com.cn/download>

Presentation Tips 报告指南

- Parallel Presentation Timing: a maximum of **15 minutes** in total, including 3 minutes for Q&A.
- It is suggested that the presenter email a copy of his/her video presentation to the conference email as a backup in case any technical problem occurs.

Conference Recording 会议录制

- The whole conference will be recorded. We appreciate you proper behavior and appearance.
- The recording will be used for conference program and paper publication requirements. The video recording will be destroyed after the conference and it cannot be distributed to or shared with anyone else, and it shall not be used for commercial nor illegal purpose. It will only be recorded by the staff and presenters have no rights to record.

Organizing Committees

会议组委会

Honorary Chair 名誉主席

Shichun Yang, Beihang University, China

Conference Chair 大会主席

Hui Zhang, Beihang University, China

Conference Co-chair 大会联合主席

Yang Shi, University of Victoria, Canada

Program Chairs 程序委员会主席

Junqiang Xi, Beijing Institute of Technology, China

Liang Li, Tsinghua University, China

Antonio Moran, Pontifical Catholic University of Peru, Peru

Jiahui Qin, University of Science and Technology of China, China

Zhi Li, Northeastern University, China

Program Co-chairs 程序委员会联合主席

Ning Sun, Nankai University, China

Jie Huang, Fuzhou University, China

Hamid Reza Karimi, Politecnico di Milano, Italy

Local Organizing Chairs 当地组织主席

Peng Dong, Beihang University, China

Xiaoming Xu, University of Science and Technology Beijing, China

Local Organizing Committees 当地组织委员会

Bingtao Ren, Beihang University, China

Zhiyang Ju, Beijing Institute of Technology, China

Jicheng Chen, Beihang University, China

Session Chairs 专题主席

Yang Tang, East China University of Science and Technology, China

Yulong Wang, Shanghai University, China

Hongpeng Wang, Nankai University, China

Shenquan Wang, Changchun University of Technology, China

Andrew Keong Ng, Singapore Institute of Technology, Singapore

Sheng-Quan Li, Yangzhou University, China

He Chen, Hebei University of Technology, China

Award Chairs 颁奖主席

Huiping Li, Northwestern Polytechnical University, China

Masashi Sugano, Osaka Metropolitan University, Japan

Huazhen Fang, University of Kansas, USA

Chenguang Yang, South China University of Technology, China
Yanzheng Zhu, Shandong University of Science and Technology, China
Rongni Yang, Shandong University, China

Women in Engineering (WIE) Chairs WIE 主席

Yan-Wu Wang, Huazhong University of Science and Technology, China
Lu Liu, City University of Hong Kong, China

Publicity Chairs 宣传主席

Ming Liu, Harbin Institute of Technology, China
Zhijun Zhang, South China University of Technology, China
Oleg Yakimenko, Naval Postgraduate School, USA
E. G. Szádeczky-Kardoss, Budapest University of Technology and Economics, Hungary
Mingxi Liu, Utah State University, USA
Vanel Lazcano, Universidad Mayor, Chile
Bingxian Mu, University of New Hampshire, USA

Publication Chairs 出版主席

Yan Shi, Beihang University, China
Guanghui Wen, Southeast University, China
Xiuyu Zhang, Northeast Electric Power University, China
Dan Zhang, Zhejiang University of Technology, China
Lin Zhao, National University of Singapore, Singapore

Regional Chairs 区域主席

Ruwan Gopura, University of Moratuwa, Sri Lanka
Juan M. Chau, Pontifical Catholic University of Peru, Peru
Manuel Jr. Ramos, University of the Philippines Diliman, Philippines

Technical Program Committees 审稿委员会

Anthony Alfaro, Pontifical Catholic University of Peru, Peru
Adel Ali Al-Jumaily, University of Technology Sydney, Australia (Senior Member, IEEE)
Mohammad Ahmad Qasim Al-Shabi, University of Sharjah, United Arab Emirates (Member, IEEE)
Gheorghe-Daniel Andreescu, Politehnica University of Timisoara, Romania (Senior Member, IEEE)
Zhumadil Baigunchekov, Al-Farabi University, Kazakhstan
Bruno Barriga, Pontifical Catholic University of Peru, Peru
Serdar Biroğul, Duzce University, Turkey
Javier Sanjuan de Caro, Universidad del Norte, Colombia
Juan M. Chau, Pontifical Catholic University of Peru, Peru
Carlos Delgado, Pontifical Catholic University of Peru, Peru
Mikael Ekström, Mälardalen University, Sweden
Toyomi Fujita, Tohoku Institute of Technology, Japan (Member, IEEE)
Sepehr Ghahramani, University College Dublin, Ireland
Giuseppina Gini, Politecnico di Milano, Italy
Ibai Inziarte Hidalgo, Aldakin Automation S.L., Spain
Soeren Hohmann, Karlsruhe Institute of Technology, Germany
Panling Huang, Shandong University, China

Gabriel Jimenez, Pontifical Catholic University of Peru, Peru
 Matt Khoshdarregi, University of Manitoba, Canada
 Yi-Horng (Tom) Lai, Xiamen University Tan Kah Kee College, China
 Xianke Lin, University of Ontario Institute of Technology, Canada
 Calvin Bin Liu, IKAS Industrial Automation, China
 John Lozano, Pontifical Catholic University of Peru, Peru
 Xiaoyu Sean Lu, Stevens Institute of Technology, USA (Member, IEEE)
 Jianchao Luo, Northwestern Polytechnical University, China
 Roy McCann, University of Arkansas, United States
 Mohamed Arezki Mellal, M'Hamed Bougara University, Algeria
 Venkatarangan Mj, PES University, India
 Zeyang Yin, Central South University, China
 Hyungpil Moon, Sungkyunkwan University, Republic of Korea
 Seng Ki Moon, Singapore Institute of Manufacturing Technology, Singapore
 Radu-Emil Precup, Universitatea Politehnica Timisoara, Romania (Member, IEEE)
 Manuel Jr. Ramos, University of the Philippines Diliman, Philippines
 Andre Rosendo, ShanghaiTech University, China (Member, IEEE)
 Sergei Semakov, Moscow Institute of Physics and Technology and Moscow Automobile and Road
 Construction Institute, Russian Federation (Member, IEEE)
 Ying Shi, Changchun Institute of Technology, China
 Jennifer C. Shih, University of California, Berkeley
 Aiguo Song, Southeast University, China
 Bassel Soudan, University of Sharjah, United Arab Emirates
 Ibrahim Sultan, Federation University, Australia (Member, IEEE)
 Belen M. Tapado, Polytechnic University of the Philippines, Philippines
 Tsuyoshi Usagawa, Kumamoto University, Japan (Member, IEEE)
 Zhiling Wang, Hefei Institutes of Physical Science, Chinese Academy of Sciences, China
 John Watkins, Wichita State University, USA
 Longhan Xie, South China University of Technology, China
 Yao Yan, University of Science and Technology of China, China
 Chunshan Yang, Guilin University of Aerospace Technology, China
 Jonghun Yoon, Hanyang University ERICA, South Korea
 Yupeng Yuan, Wuhan University of Technology, China
 Chengliang Zhang, University of Jinan, China
 Xiaocong Zhu, Zhejiang University, China
 Yaguang Zhu, Chang'an University, China (Member, IEEE)
 Chungang Zhuang, Shanghai Jiao Tong University, China
 Eugenia Zhuo, University of Santo Tomas, Philippines (Member, IEEE)

Conference Speaker

大会报告人



Prof. Yuanqing Xia

Beijing Institute of Technology, China

夏元清 教授, 北京理工大学
长江/杰青/万人计划领军人才、自动化学院院长



Beijing Time: 09:40-10:10, Apr. 22nd, 2023

Onsite Room: The 16th Conference Room (B1 Floor)

ZOOM ID: 850 7469 1857

ZOOM Link: <https://us02web.zoom.us/j/85074691857>

Workflow Scheduling in Cloud Control Systems

BIO Yuanqing Xia is a chair professor and doctoral supervisor at Beijing Institute of Technology. He is now the dean of School of Automation, Beijing Institute of Technology. In 2012, he obtained the National Science Foundation for Distinguished Young Scholars of China, and in 2016, he was honored as the Yangtze River Scholar Distinguished Professor and was supported by National High Level Talents Support Plan ("Million People Plan") by the Organization Department of the CPC Central Committee. In 2017, he was approved to enjoy the government allowances of the State Council. His current research interests are in the fields of networked control systems, robust control and signal processing, active disturbance rejection control, flight control and cloud control. He has published eight monographs in Springer and John Wiley, and more than 200 papers in journals. He is an Editor in deputy of the Journal of the Beijing Institute of Technology, Associate Editor of Acta Automatica Sinica, Control Theory and Applications, International Journal of Innovative Computing, Information and Control, International Journal of Automation and Computing. He is currently the director of ized committee on cloud control and decision of Chinese Institute of Command and Control (CICC), the vice chairman of China Internet of Things Working Committee, the director of the ninth Council of the Systems Engineering Society of China, and the director of the first Council of CICC.

ABSTRACT With the development of cloud computing, more and more workflow applications have been migrated to the cloud. Workflows scheduling becomes a challenging issue for meeting various quality of service (QoS) constraints due to the large scale of workflows and elasticity and heterogeneity of cloud resources. In this talk, we will present our recent works on workflows scheduling in cloud control systems. Firstly, we propose a Scoring and Dynamic Hierarchy-based NSGA-II (Nondominated Sorting Genetic Algorithm II) to minimize both makespan and cost of workflow execution and design a Multi-swarm Co-evolutionary-based Hybrid Optimization (MCHO) algorithm for multiple-workflow scheduling to minimize total makespan and cost while workflow deadline constraints. Then, we introduce some workflow scheduling strategies which is based on the intelligent optimization algorithm for solving constrained optimization workflow scheduling problems in cloud control systems. Furthermore, we focus on the workflows dynamic scheduling problem and design the multi-workflows scheduling algorithms with uncertainty in clouds to minimize total cost and improve cloud resource utilization. Finally, a cloud workflow management platform which can manage cloud workflows efficiently is developed to support the implementation of scheduling algorithms and the application of workflow scheduling in cloud control systems is introduced with the workflow management platform.

Conference Speaker

大会报告人



Prof. Yan Shi

Beihang University, China

石岩 教授, 北京航空航天大学
国家“万人计划”青年拔尖人才

Beijing Time: 10:10-10:40, Apr. 22nd, 2023

Onsite Room: The 16th Conference Room (B1 Floor)

ZOOM ID: 850 7469 1857

ZOOM Link: <https://us02web.zoom.us/j/85074691857>

Pressure Control Study on Mechanical Ventilation Based on Adaptive Fuzzy-PID Compensation

BIO Yan Shi is a professor in the School of Automation Science and Electrical Engineering, Beihang University, Beijing, China. He received his doctoral degree in mechanical engineering from Beihang University. His research interests include mechanical and electronic engineering, automatic control, fluid transmission and control intelligent medical devices, energy-saving technologies of pneumatic systems and pneumatic components design and processing key technologies. He has undertaken more than 20 national projects in recent years, and he was awarded an IET fellow in 2022. He has published more than 100 SCI papers, and has granted more than 20 national invention patents. He has won the second prize of the “National Science and Technology Progress Award” (rank 2), and two first prize for the Science and Technology Progress Award of national-level societies (rank 1). He has been selected as the Chief Scientist of the Key Basic Research Program (173 Program) of the JCJQ Program, the Project Leader of the National Key Research and Development Program, the Young Talent of the "Ten Thousand People Program".

ABSTRACT To improve the effectiveness and safety of ventilation device for critical patients, a new simulated ventilation device based on pneumatic system is proposed. In order to accurately settle the control pressure and response time of supplied air, an adaptive control algorithm on the mechanical ventilation based on fuzzy-PID is proposed. Both simulation and experimental studies on the airflow dynamics are conducted. For different patient's condition, we analyze three ventilation working situations with different settled pressure levels. The results show that the adaptive fuzzy-PID compensation regulation makes the increase and decrease of the pressure become smoother without high fluctuation, and lead to a better control. The overshoot of the ventilation device can be decreased to zero, control error can be limited within 2%, and response time can be reduced to about 1/30. This paper provides a constructive suggestion for the development of mechanical ventilator technologies.

Conference Speaker

大会报告人



Prof. Degang Xu

Central South University, China

徐德刚 教授，中南大学
自动化学院副院长

Beijing Time: 11:20-11:50, Apr. 22nd, 2023

Onsite Room: The 16th Conference Room (B1 Floor)

ZOOM ID: 850 7469 1857

ZOOM Link: <https://us02web.zoom.us/j/85074691857>

Intelligent Perception and Precise Control Method of Slag Removal Robot for Non-Ferrous Metal Casting Process

BIO Degang Xu received the Ph.D. degree in control science and engineering from Zhejiang University, China, in 2007. From 2010 to 2013, he was a Postdoctoral Fellow with Central South University. He was with the Department of Electrical Engineering, University of Florida, United States of America, from 2013 to 2014. He is currently a Full Professor with Central South University. His current research interests include modelling and optimal control of complex industrial process, robots control system, and intelligent control system. Prof. Xu has published more than 90 papers on the IEEE Transactions on Industrial Electronics, IEEE Transactions on Cybernetics, and top international conferences. He has authored 2 research monographs. He is also the inventor of more than 30 patents. He was honored “Hunan Furong Young Scholar” in 2022. He has established a very solid link with many Chinese industries including the field of the online detection technology intelligent control methods for Non-Ferrous metal production, intelligent systems for construction machinery and equipment. He won the Second Prize of Science and Technology Progress Award from the Nonferrous Metals Society of China in 2022, First Prize of Science and Technology Progress Award from The Quality Evaluation Society of China in 2017, respectively.

ABSTRACT The non-ferrous metal casting process is a process, which molten liquid metal is cast, cooled and crystallized into solid metal ingots in the casting mould. The metal ingot casting process is in a production environment with high temperature, strong toxicity and high risk. At present, it relies on manual operation to remove the oxide slag, which leads to high labour intensity, high safety risks and unstable product quality. In view of the urgent need to realize automatic operation in the non-ferrous metal casting process, the intelligent perception method based on multi-source information fusion of robot vision signal and force perception is proposed to realize online and accurate detection of the shape of metal ingot mould and semi-solid oxide slag, and the surface flatness of ingot after slagging. According to the characteristics of slag-raking process and operation requirements, the real-time trajectory planning and precise control methods of robots based on visual/force perception information are proposed. And the intelligent robot operation system is developed, which has been used to the intelligent slag-raking operation in the casting process.

Conference Speaker

大会报告人



Prof. Cailian Chen

Shanghai Jiao Tong University, China

陈彩莲 教授, 上海交通大学



Beijing Time: 09:35-10:05, Apr. 23rd, 2023

Special Section:

Women in Control, Automation and Robotics (CAR)

ZOOM ID: 850 7469 1857

ZOOM Link:

<https://us02web.zoom.us/j/85074691857>

Heterogeneous Data Deterministic Transmission for Factory Automation

BIO Cailian Chen is currently a Distinguished Professor of Shanghai Jiao Tong University, Shanghai, P. R. China. Her research interests include industrial wireless networks and computational intelligence, and Internet of Things. She has authored 4 research monographs and over 100 referred international journal papers. She is the inventor of more than 30 patents. Dr. Chen received the prestigious "IEEE Transactions on Fuzzy Systems Outstanding Paper Award" in 2008, IEEE Technical Committee of Cyber-Physical Systems (TCCPS) Industrial Excellence Award in 2022, and 5 conference best paper awards. She won the Second Prize of National Natural Science Award from the State Council of China in 2018, First Prize of Natural Science Award from The Ministry of Education of China in 2006 and 2016, respectively, and First Prize of Technological Invention of Shanghai Municipal, China in 2017. She was honored "National Outstanding Young Researcher" by NSF of China in 2020 and "Changjiang Young Scholar" in 2015. She serves as Area Editor of National Science Open, and Associate Editor of IEEE Transactions on Vehicular Technology, and IET Cyber-Physical Systems: Theory and Applications. She also served as TPC Chair of ISAS'19, Symposium TPC Co-chair of IEEE Globecom 2016, Track Co-chair of VTC2016-fall and VTC2020-fall.

ABSTRACT With the rapid development of information and communication technology, industrial Internet of Things (IIoT) integrated with wireless technology has been implemented in factory automation and promoted the integration of IT and OT. However, compared with the wired communication, wireless communication faces various new challenges. Complex and serious electromagnetic interference, dynamic and variable wireless links, and blocking of large mobile equipment lead to the difficulties on real-time, reliable and deterministic transmission in the fields of factory. By taking the full advantage of time-frequency-space multi-dimensional resources to design a cooperative transmission mechanism, it can effectively resist fading, suppress interference, and significantly improve end-to-end information transmission performance. In this talk, we will discuss the distributed dynamic sensing method and the design of deterministic transmission mechanism for heterogeneous data based on field-level industrial IIoT. We propose the correlation feature learning mechanism and resource pre-allocation strategy for matching processes to avoid the complex handshake overhead under the traditional dynamic access mechanism, thus reducing access delay and jitter, and improving resource utilization. Time-sensitive network (TSN) gateway devices and testbed are developed to ensure the performance of heterogeneous data transmission. It enables the configuration flexibility and dynamic networking of on-site devices to enhance the field-level sensing and monitoring capability of industrial IIoT.

Conference Speaker

大会报告人



Prof. Yan-Wu Wang

Huazhong University of Science and Technology, China

王燕舞 教授，华中科技大学
华中科技大学华中卓越学者，教育部新世纪优秀人才



Beijing Time: 10:05-10:35, Apr. 23rd, 2023

Special Section:

Women in Control, Automation and Robotics (CAR)

ZOOM ID: 850 7469 1857

ZOOM Link:

<https://us02web.zoom.us/j/85074691857>

Cooperative Control in DC Microgrid: Voltage Regulation and Current Sharing

BIO Yan-Wu Wang received the B.S. degree in automatic control, the M.S. degree and the Ph.D. degree in control theory and control engineering from Huazhong University of Science and Technology (HUST), Wuhan, China, in 1997, 2000, and 2003, respectively. She has been a Professor with the School of Artificial Intelligence and Automation, HUST, since 2009. Her research interests include hybrid systems, cooperative control, and multiagent systems with applications in smart grid. Currently she serves in the editor boards of several journals, including IEEE Transactions on Smart Grid, International Journal of Robust and Nonlinear Control, Journal of the Franklin Institute, and Neurocomputing. Dr. Wang was a recipient of several awards, including the first prize of Natural Science Award of Hubei Province in 2014, the first prize of Natural Science Award of the Ministry of Education of China in 2005, and the Excellent PhD Dissertation of Hubei Province in 2004, China. In 2008, she was awarded the title of "New Century Excellent Talents" by the Ministry of Education of China.

ABSTRACT DC microgrid is a power system that consists of distributed generators, energy storage facilities, energy conversion devices, and power loads. By integrating various power sources, DC microgrid is essential in promoting sustainable energy development and thus it becomes an important part of smart grid construction. In a DC microgrid, it is critical to coordinate multiple power sources to ensure a stable power supply for the loads. This typically involves two control objectives: maintaining a stable bus voltage and achieving reasonable current sharing among the sources. This talk will focus on the cooperative power supply control of multiple sources from three aspects: how to improve the convergence rate and the dynamic performance; how to reduce the communication burden during the control process; how to ensure the performance against potential attacks. We will also discuss the possible research topics in the future.

Conference Speaker

大会报告人



Prof. Jing Liang

Zhengzhou University, China

梁静 教授, 郑州大学
电气工程学院院长



Beijing Time: 10:45-11:15, Apr. 23rd, 2023

Special Section:

Women in Control, Automation and Robotics (CAR)

ZOOM ID: 850 7469 1857

ZOOM Link:

<https://us02web.zoom.us/j/85074691857>

Evolutionary Constrained Multiobjective Optimization

BIO Jing Liang is a Professor at Henan Institute of Technology, China. She is the deputy Party secretary and vice-principal. She received the B.E. degree from Harbin Institute of Technology, China and the Ph.D. degree from the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore. Her main research interests are evolutionary computation, swarm intelligence, multiobjective optimization, and neural network. Prof. Liang is a member of the IEEE Computational Intelligence Society (CIS) and a member of the IEEE Computational Intelligence Society Emergent Technology Technical Committee (IEEE CIS ETTC). She has obtained the NSFC Outstanding Youth Science Fund Project. She won the IEEE CIS Outstanding Ph.D. Dissertation Award, the Second prize of Natural Science Award of Ministry of Education, 2021 and 2022 Highly Cited Chinese Researcher (Scopus ELSEVIER), Outstanding Young Science and Technology Experts in Henan Province, High-Level Talents in Henan Province, Chief Science Popularization Expert of Henan Province, and IEEE Transactions on Evolutionary Computation (TEVC) Outstanding Associate Editor.

ABSTRACT Constrained multiobjective optimization problems (CMOPs) widely exist in scientific research and practical applications. They involve multiple objectives to be optimized and various constraints to be satisfied, which proposes serious challenges for solvers. During the past several decades, evolutionary algorithms have been widely used to solve multiobjective optimization problems because they have better global search ability and can output a set of non-dominated solutions. In this report, CMOPs and research difficulties will be described in detail. Then, three kinds of constrained multiobjective evolutionary algorithms, including objective information utilization-based evolutionary algorithms, evolutionary multitasking-based evolutionary algorithms, and constrained multi-modal multiobjective evolutionary algorithms, will be introduced. For objective information utilization-based evolutionary algorithms, single-phase and two-phase algorithms will be introduced, and they mainly utilize objective information to explore infeasible regions and maintain diversity. For evolutionary multitasking-based evolutionary algorithms, they transform a CMOP into a multitasking optimization problem by creating simple auxiliary tasks with fewer constraints. Moreover, two algorithms focus on what to transfer and the form of auxiliary task will be introduced. For constrained multi-modal multiobjective evolutionary algorithms, they consider the multi-modal characteristics and aim to find multiple equivalent feasible Pareto optimal solution sets. Meanwhile, a new benchmark test suite and a new performance indicator will be introduced. Finally, the future works on evolutionary constrained multiobjective optimization will be given.

Conference Speaker

大会报告人



Prof. Hao Zhang

Tongji University, China

张皓 教授，同济大学
电子与信息工程学院副院长



Beijing Time: 11:15-11:45, Apr. 23rd, 2023

Special Section:

Women in Control, Automation and Robotics (CAR)

ZOOM ID: 850 7469 1857

ZOOM Link:

<https://us02web.zoom.us/j/85074691857>

Multi-agent Formation Navigation in a Feasible Space-constrained Environment

BIO Professor Zhang graduated from Huazhong University of Science and Technology with PhD in Control Theory and Control Engineering in 2007. In September 2007, she taught at the Department of Control Science and Engineering in the College of Electronic and Information Engineering, Tongji University. In 2010, she was awarded associate professor and supervisor for master students. From December 2011 to December 2013, she worked as a "Xiang Jiang Scholar" to do the postdoctoral research in the Department of Mechanical and Biological Engineering in the City University of Hong Kong, whose collaborator is the IEEE Fellow Professor Gary Feng. Her research interests include the Autonomous systems, multi-agent systems, data based optimization and control, safety and security, multi-robot systems and so on. She has published over 100 papers, and over 90 papers are published on Automatica and IEEE transaction magazine, 13 authorized invention patents. She won eight provincial and ministerial awards, including one First Prize of Shanghai Natural Award, two First Prize of Shanghai Science and Technology Progress, and one Second Prize of Ministry of Education Natural Award.

ABSTRACT In recent years, the rapid development of sensor and communication technology enables the application of multi-agent coordination in complex environments, such as geographical exploration, search and rescue, cooperative reconnaissance and monitoring. Under this trend, multi-agents systems are more likely to work in cluttered environments, where safety constraints like obstacles and inter-agent collision avoidance can not be ignored. We will explore in this talk on how to systematically integrates collision-free navigation into multi-agent formation.

Onsite Sessions

Beijing, China | April 22, 2023

中国, 北京 | 2023 年 4 月 22 日

Special Session 1A

Control of Advanced Robotic and Mechatronic Systems

先进机器人及机电系统控制

Chair: Zhiyang Ju, Beijing Institute of Technology, China

Beijing Time: 14:00-15:30
22nd Apr. 2023

The 16th Conference Room (B1 Floor)
B1 层第十六会议室

RA0236

14:00-14:15

State Feedback Fault Tolerant Control for Flexible Bevel-Tip Needle Based on Proportional Multiple-Integral Observer

Chaojie Zhu, Hui Zhang and Zhi Qi, **Hanwen Zhang**
Beihang University, China

RA0281A

14:15-14:30

Coordinated Motion Planning of Dual Boom Cranes for Payload Non-Horizontal Transportation

Zhuoqing Liu, Tong Yang, Qingxiang Wu and Prof. Ning Sun
Nankai University, China

RA0282A

14:30-14:45

Periodic SMC Method for 4-DOF Tower Crane Systems Under Unknown Control Direction

Prof. Menghua Zhang
University of Jinan, China

RA0318

14:45-15:00

Unsupervised Time Series Anomaly Detection Based on Adversarial Interpolation and Pseudo-anomaly Calibration

Prof. Xinwei Chen, Xiaohui Lin, Zuoyong Li and Haoyi Fan
Minjiang University, China

RA0400

15:00-15:15

Trajectory Planning of a Humanoid One-legged Robot with Tendon Elastic Actuation during Squatting after Landing

Pengcheng Lin
Harbin Institute of Technology, China

RA0402

15:15-15:30

Deadlock-free Scheduling of Flexible Manufacturing Systems Subject to No-Wait Constraints

Pei Yin and Dr. Jianchao Luo
Northwestern Polytechnical University, China

Special Session 3A

Autonomous Safety Control in Aerospace Applications

航空航天领域中的自主安全控制

Chair: Jing Chang, Xidian University, China

Maolong Lv, Air Force Engineering University, China

Beijing Time: 14:00-15:00

22nd Apr. 2023

The 8th Conference Room (B1 Floor)

B1 层第八会议室

RA0261

Obstacle Avoidance Based on Deep Reinforcement Learning and Artificial Potential Field

Haoran Han, Zhilong Xi, Jian Cheng, Maolong Lv

14:00-14:15

University of Electronic Science and Technology of China, China

RA0215

Multi-Time-Stage Collaborative Task Assignment for Heterogeneous UAVs Using CBBA

Dr. Wenfei Wang, Le Ru, Maolong Lv and Bo Lu

14:15-14:30

Air Force Engineering University, China

RA0398

Distributed Interval Observer-Based Fault Detection for A Class of Distributed Measurement Systems

Danxia Li, **Dr. Jing Chang**, Weisheng Chen and Jérôme Cieslak

14:30-14:45

Xidian University, China

RA0228

Improving Cooperative Multi-Target Tracking Control for UAV Swarm Using Multi-Agent Reinforcement Learning

Dr. Longfei Yue, Maolong Lv, Mengda Yan, Xiaoru Zhao, Ao Wu, Leyan Li, Jialiang Zuo

14:45-15:00

Air Force Engineering University, China

Special Session 4A

Intelligent Perception and Control of Networked Motion Control Systems

网络化运动控制系统智能感知与控制

Chair: Dan Zhang, Zhejiang University of Technology, China

Beijing Time: 14:00-15:45
22nd Apr. 2023

The 6th Conference Room (B1 Floor)
B1 层第六会议室

RA0248

Prescribed Performance Global Consensus Control of Non-Affine Multi-Agent Networks

Dr. Ning Wang, Xiaolin Wang, Wenjie Tian and Lei Zhang

14:00-14:15

Naval Aviation University, China

RA0220

Robust Model Predictive Control Based Cooperative Control of Uncertain Connected Vehicle Platoon Systems

Hao Zeng, Zehua Ye and Prof. Dan Zhang

14:15-14:30

Zhejiang University of Technology, China

RA0264

Neural-adaptive Quantized Consensus Tracking Control of High-order Power-chained Nonlinear Multi-agent Networks with Switched Dynamics: A Specified-Time Convergence Protocol

Dr. Chuhan Zhou and Ying Wang

14:30-14:45

Air Force Engineering University, China

RA0310

Contour Tracking Control of Networked Motion Control System Using Improved Equivalent-Input-Disturbance Approach

Wenjie Lin, Guangpu Huang, Qun Lu, Lifeng Luo, Xiang Wu and Dan Zhang

14:45-15:00

Zhejiang University of Technology, China

RA0317A

A Hybrid Event-Triggered Stabilization Approach for Switched Systems Under Asynchronous Switching and Its Application

Wenqian Xie, Kaibo Shi and Shouming Zhong

15:00-15:15

Zhejiang Gongshang University, China

RA0278A

An Adaptive Activation Transfer Learning Approach for Fault Diagnosis of Motion Control System in Rotating Machinery

Dr. Yongyi Chen, Dan Zhang

15:15-15:30

Zhejiang University of Technology, China

RA0249

Optimal Power Regulating for Wind Turbine with LQR and Disturbance Accommodation Pitch Control

Haoyuan Wen, Yajuan Liu, S.M. Lee and Ju H. Park

15:30-15:45

North China Electric Power University, China

Special Session 5

Advanced Fluid Power Transmission and Control

先进流体传动与控制

Chair: Yixuan Wang, Beihang University, China

Beijing Time: 16:00-17:00
22nd Apr. 2023

The 16th Conference Room (B1 Floor)
B1 层第十六会议室

RA0243

Nonlinear Control of Flexible Bevel-tip Needles in LPV System for Plane Path Following

Hanwen Zhang, Zhi Qi and Hui Zhang

16:00-16:15

Beihang University, China

RA0397

Reliability Analysis and Cloud-aided Health Management for Electric Locomotive Vehicle Circuit Board

Bing Shang, **Zhuoyun Li** and Zhi Qi

16:15-16:30

CRRC Dalian R&D Co. LTD

RA0263

Wheel Pressure Estimation of Hydraulic Integrated Braking System by Fusion Model

Lingtao Wei, Xiangyu Wang and Liang Li

16:30-16:45

Tsinghua University, China

RA0274

Research on Backstepping Control of Flexible Joint Manipulator with State Constraint

Dr. Yong-Li Yan, Li Ding, Teng Ren and Fu-Cai Liu

16:45-17:00

Beihang University, China

Special Session 6

Space Intelligence Dexterous Operation

空间智能灵巧操作

Chair: Xin Li, Beijing Institute of Spacecraft System Engineering, China

Beijing Time: 16:00-17:30
22nd Apr. 2023

The 8th Conference Room (B1 Floor)
B1 层第八会议室

RA0269 16:00-16:15	A Design for Front Ends in Satellite-Based Binocular SLAM System Based on Multi-Core Digital Signal Processor Yuhang Wu , Luyuan Wang and Bowen Cheng Beijing Institute of Spacecraft System Engineering, China
RA0233 16:15-16:30	Learning-Based Optimal Impedance Control for Space Manipulator Contact Tasks Dr. Han Wu , Kaipeng Sun, Qinglei Hu, Yongxia Shi, Jianying Zheng and Jiawen Wang Beihang University, China
RA0410 16:30-16:45	Human-Robot Collaboration Based on Gaussian-Mixture Model Jiixin Guo , Luyuan Wang, Jiyang Yu and Weiwei Liu Beijing Institute of Spacecraft System Engineering, China
RA0412 16:45-17:00	Optimized Design of On-Board Storage System Based on CFDP Protocol Xin Li , Weiwei Liu, Yuehua Niu and Jiyang Yu Beijing Institute of Spacecraft System Engineering, China
RA0294 17:00-17:15	Task Allocation Method for Multi-unmanned Marine Vehicle Cooperative Formation Jie Wu, Zikang Hao , Zhenning Liu and Yanyan Li Wuhan University of Technology, China
RA0321 17:15-17:30	Progressive Rapidly-exploring Random Tree for Global Path Planning of Robots Miaomiao Tian and Jiyang Yu Beijing Institute of Spacecraft System Engineering, China

Session 7

Object Detection and Machine Vision

物体检测与机器视觉

Chair: Shenshen Luan, Beijing Institute of Spacecraft System Engineering, China

Beijing Time: 16:00-17:30
22nd Apr. 2023

The 6th Conference Room (B1 Floor)
B1 层第六会议室

RA0381 Convolutional Radon Transformation Method for Sparse Collective Recognizing
Bowen Cheng, Dan Wang, Jiayang Niu, Xiaoda Li and Shenshen Luan
16:00-16:15 Beijing Institute of Spacecraft System Engineering, China

RA0315 Parallel and Accelerated Feature Extraction of Manipulative Scene of Space Dim Target
Jiyang Yu, **Dan Huang**, Jinyang Li, Wenjie Li, Xiangjie Wang and Xiaolong Shi
16:15-16:30 China Research and Development Academy of Machinery Equipment, China

RA0330 Vision-Based High-Precision Assembly with Force Feedback
Yurou Chen, Jiyang Yu, Liancheng Shen, Zhenyang Lin and Zhiyong Liu
16:30-16:45 China Institute of Automation, Chinese Academy of Sciences, China

RA0360 Cascade Aggregation Network for Ship Instance Segmentation
Dr. Yuxin Sun, Li Su, Shouzheng Yuan and Hao Meng
16:45-17:00 Harbin Engineering University, China

RA0375 On the Optimal Path Following for an Autonomous Vehicle via Nonlinear Model Predictive Control
Jun-Ting Li, **Prof. Chih-Keng Chen** and Hongbin Ren
17:00-17:15 National Taipei University of Technology, China

RA0358 IA*QB: An Efficient Trajectory Planning Approach for the Automatic Berthing of Unmanned Surface Vessel
Shouzheng Yuan, Zhilin Liu, Yuxin Sun, Simeng Song and Zhongxin Wang
17:15-17:30 Harbin Engineering University, China

Online Sessions

Beijing, China | April 23, 2023

中国, 北京 | 2023 年 4 月 23 日

Special Session 1B

Control of Advanced Robotic and Mechatronic Systems

先进机器人及机电系统控制

Chair: Tong Yang, Nankai University, China

Beijing Time: 13:00-14:30

23rd Apr. 2023

Zoom ID: 860 1556 7851

Link: <https://us02web.zoom.us/j/86015567851>

RA0335

13:00-13:15

Automation of Banana Fiber for Improving Mechanical Properties of Concrete
Marcelo Miguel De la Cruz-Calderon, Cesar Elmer Taboada-Perez, Axel Anyelo Luque-Saico, Juan Jose Bullon-Rosas
Universidad Continental, Peru

RA0142

13:15-13:30

Dynamic Modeling and Validation of Soft Robotic Snake Locomotion
Dimuthu Kodippili Arachchige, Dulanjana Perera, Sanjaya Mallikarachchi, Iyad Kanj, Yue Chen, Hunter Gilbert and Isuru Godage
DePaul University, USA

RA0250

13:30-13:45

Modeling and Implementation of a 3 Degrees of Freedom Delta Robot through Gestalt Framework
Luz Condori Pacori and Nilton Anchayhua Arestegui
San Pablo Catholic University, Peru

RA0298

13:45-14:00

Cuckoo Search Algorithm Optimization of Holt-Winter Method for Distribution Transformer Load Forecasting
Ciprian Charles Mauricio and **Conrado Ostia Jr**
Mapua University, Philippines

RA0240

14:00-14:15

Research on Arrhythmia Classification Based on Domain Adaptation
Luyao Chao, Zhanbo Li and Hongpo Zhang
Zhengzhou University, China

RA0299

14:15-14:30

Motor Fault Diagnosis of a Brushless DC Motor using Fast Kurtogram on Convolutional Neural Network
Joselito Flores Jr and Conrado Ostia Jr
Mapua University, Philippines

RA0267

14:30-14:45

Adaptive Fuzzy Fault-Tolerant Attitude Control for Unmanned Aerial Vehicle
Dr. Zhilong Yu, Yinghui Li, Binbin Pei, Wenfeng Xu, Zehong Dong and Maolong Lv
Air Force Engineering University, China

Special Session 2

Intelligent and Sustainable Solutions for Liveable Cities

宜居城市的智能和可持续解决方案

Chair: Andrew Keong Ng, Singapore Institute of Technology, Singapore

Beijing Time: 13:00-14:30

23rd Apr. 2023

Zoom ID: 831 9464 1295

Link: <https://us02web.zoom.us/j/83194641295>

Design of a Control System for Monitoring Overflows for Water Catchment Infrastructure in Rural Areas

RA0365

13:00-13:15

Erick Ramiro Segovia Gutarra, **Maycol Alberth Inga Huanay**, Jhon Jefferson Rojas Murillo, Giovene Perez Campomanes, Sario Angel Chamorro Quijano and Diego Cajachagua Guerreros
Universidad Continental, Peru

RA0132

13:15-13:30

Decentralized Data Collection via Swarm Contracts: Study on Crowd-Sourced Google Maps
Sanjaya Mallikarachchi, Bonnie Ho, Oshani Seneviratne, Iyad Kanj and Isuru Godage
DePaul University, USA

RA0270

13:30-13:45

Brushless DC Motor Fault Classification using Support Vector Machine Algorithm with Discrete Wavelet Transform Feature Extraction
Jeffrey Casem, Giemer Marey Golecruz and Conrado Ostia Jr
Mapua University, Philippines

RA0371

13:45-14:00

Intelligent Ventilation Management System of Laboratory Based on Fuzzy Logic
Wei Zhou, Ziqi Zeng and Shijie Bao
Xiamen University of Technology, China

RA0277

14:00-14:15

Design, Development and Implementation of an Effective and Efficient Emergency Third Rail Fishplate Joint Clamp
Shawn Jun Jie Pang and Andrew Keong Ng
Singapore Institute of Technology, Singapore

RA0339

14:15-14:30

Image Enhancement and Detection of Courier Slips Based on Affine Transform
Xin Wang, Fan Xu, Yan Ye and Yishen Xu
Soochow University, China

RA0336

14:30-14:45

Learning Sufficient Correlations Among Points for 3D Non-rigid Point Cloud Registration
Chen Li, Anshun Xue, Chongkun Xia, Houde Liu and Bin Liang
Tsinghua University, China

Special Session 1C

Control of Advanced Robotic and Mechatronic Systems

先进机器人及机电系统控制

Chair: Henglai Wei, Nanyang Technological University, Singapore

Beijing Time: 13:30-15:15
23rd Apr. 2023

Zoom ID: 850 7469 1857
Link: <https://us02web.zoom.us/j/85074691857>

RA0272

13:30-13:45

Robotic Arm for Unfastening Screws in Automated Disassembly Process
Konkala Manisha, Ananya S Kudaloor, Dasari Geervani, Kota Sanjeev Sannihith and Shwetha G
PES University, India

RA001

13:45-14:00

An Application of a Set-Valued State Estimator Based on Constrained Zonotopes in GNSS-INS Integration
Fawad Farooq Ashraf
Centers of Excellence in Science & Applied Technologies, Pakistan

RA0043

14:00-14:15

Motion Planning of Dual-Chain Manipulator Based on Artificial Bee Colony Algorithm
Dr. Zhenyong Zhou, Jing Zhao, Ziqiang Zhang and Xiaohui Li
Beijing University of Technology, China

RA0285

14:15-14:30

The Path Integral Motion Planning of the Cable-Driven Segmented Redundant Manipulators
Hongji Shang, Lunfei Liang, Xiaojun Zhu, Bin Lan and Xueqian Wang
Shenzhen International Graduate School, Tsinghua University, China

RA0369

14:30-14:45

Deep Reinforcement Learning-Based Control of Bicycle Robots on Rough Terrain
Xianjin Zhu, Xudong Zheng, Yang Deng, Zhang Chen, Bin Liang and Yu Liu
Harbin Institute of Technology, China

RA0392

14:45-15:00

Analysis of the Performance of an Omnidirectional Bionic Leg
Yuze Xu, Jianzhong Shang, Shanjun Chen, Minghai Xia, Yiming Zhu and Zirong Luo
National University of Defense Technology, China

RA0399

15:00-15:15

Growing Robot Navigation Based on Deep Reinforcement Learning
Ahmad Ataka and Andreas P Sandiwan
Universitas Gadjah Mada, Indonesia

Special Session 3B

Autonomous Safety Control in Aerospace Applications

航空航天领域中的自主安全控制

Chair: Yongxia Shi, City University of Hong Kong, China

Beijing Time: 13:30-15:30
23rd Apr. 2023

Zoom ID: 895 1238 6100
Link: <https://us02web.zoom.us/j/89512386100>

RA0356

13:30-13:45

Multi-UAV Path Planning with Collision Avoidance in 3D Environment Based on Improved APF

Xiaojun Wu, **Siyu Wu**, Sheng Yuan, Xiaolong Wang and Yibo Zhou
Xi'an Jiaotong University, China

RA0414

13:45-14:00

Research on Autonomous Decision-Making in Manned/Unmanned Coordinated Air Combat

Xiangming Dou, Guojian Tang, **Aoyu Zheng**, Han Wang, Xiaolong Liang
Air Force Engineering University, China

RA0396

14:00-14:15

Research on the Dynamic Obstacle Avoidance Method of Unmanned Surface Vehicle Based on RVO

Sujun Zhang, Chenfei Wu and Yulong Wang
Shanghai University, China

RA0383

14:15-14:30

Accurate Localization for Indoor and Outdoor Scenario by GPS and UWB Fusion

Jie Luo, **Zhengshuai Yin**, Linqiu Gui and Xu Yang
Wuhan University of Technology, China

RA0291

14:30-14:45

Learning Pre-Grasp Manipulation of Multiple Flat Target Objects in Clutter

Dr. Liangdong Wu, Jiaxi Wu, Yurou Chen, Zhengwei Li and Zhiyong Liu
University of Chinese Academy of Sciences, China

RA0300

14:45-15:00

Hierarchical Attention-Based Fully Convolutional Network for Satellite Cloud Classification and Detection

Dan Jin and Mingqiang Li
Information Science Academy of China Electronics Technology Group Corporation, China

RA0245

15:00-15:15

Flight Path Simulation of Maneuverable Unmanned Aerial Vehicles Based on Kalman Filter

Wenda Yang, Xiangxi Wen, Maolong Lv and Minggong Wu
Air Force Engineering University, China

RA0211

15:15-15:30

A Specified-Time Cooperative Optimal Control Approach to Unmanned Aerial Vehicle Swarms

Dr. Ao Wu, Rennong Yang, Huanyu Li and Maolong Lv
Air Force Engineering University, China

Special Session 4B

Intelligent Perception and Control of Networked Motion Control Systems

网络化运动控制系统智能感知与控制

Chair: Jun Cheng, Guangxi Normal University, China

Beijing Time: 15:45-17:45
23rd Apr. 2023

Zoom ID: 850 7469 1857
Link: <https://us02web.zoom.us/j/85074691857>

RA0280 15:45-16:00	Tool Path Interpolation Method in Five-Axis CNC Machining Wang Jinjie , Geng Cong, Geng Dapeng and Zhang Han Shenyang Jianzhu University, China
RA0287 16:15-16:30	Energy and Time-efficient Trajectory Planning and Geometric Control for Quadrotor Waypoints Flight Ziniu Wu and Ruonan Zhang University of Bristol, UK
RA0219 16:30-16:45	Youla Parameterized Control Against Line Spectrum Vibration with an Adaptive Forgetting Factor Improved by A Genetic Algorithm Qimin Li, Mengjing Li, Zhentan Li, Jiahao Zhu, Jinglei Zhao, Ruqing Bai, Xueping Li, Jun Luo, Huayan Pu and Dr. Shujin Yuan Chongqing University, China
RA0254 16:45-17:00	Path Planning of Autonomous Driving Based on Quadratic Optimization Yi Wei and Haiqin Xu Donghua University, China
RA0372 17:00-17:15	Optimal Bandwidth Selection for DENCLUE Algorithm Hao Wang Ratidar Technologies LLC, China
RA0122 17:15-17:30	Emergency Braking Control in 3D Overhead Cranes using a switching PD-Fuzzy Controller Arup Deka and Sandeep Reddy Basireddy Indian Institute of Technology, India
RA0406 17:30-17:45	Fault Prediction Model of Wind Power Pitch System Based on BP Neural Network Zhenhui Ou , Dingci Lin and Prof. Jie Huang Fuzhou University, China

Session 8

The Application of Intelligent Image Processing in Modern Electronic Information Systems

智能图像处理在现代电子信息系统中的应用

Chair: Eugenia Zhuo, University of Santo Tomas, Philippines

Beijing Time: 15:45-17:15
23rd Apr. 2023

Zoom ID: 895 1238 6100
Link: <https://us02web.zoom.us/j/89512386100>

RA0062 15:45-16:00	Evaluation of Older Adults' Preference Factors for Serious Games Bao-Yi Zhang and Yi-Ming Gao Xiamen University of Technology, China
RA0380 16:00-16:15	A Novel Distributed Algorithm to Seek GNE for Aggregative Games via Primal-Dual Proximal Gradient Dr. Zhe Li , Huaqing Li, Liang Ran, Songyang Li, Lüming Fan, Lifeng Zheng and Jun Li Southwest University, China
RA0295 16:15-16:30	Global Information Attention Based Dual-Pathway Network for Oxidized Slag Segmentation of Metal Ingot Images Ao Zhang , Degang Xu, Xuming Liu and Jie Wu Central South University, China
RA0072 16:30-16:45	Analyzing the Attractiveness Factors of Health Wearables for Older Adults using EGM and Quantification Theory Type I Bao-Yi Zhang, Han-Xuan Liu and Ying-Jie Song Xiamen University of Technology, China
RA0224 16:45-17:00	Review on the Research Status of Intelligent Level Classification Yubing Wang , Weijia Wang, Boyang Zhang, Jingye Peng and Han Luo Beijing Blue Sky Innovation Center for Frontier Science, China
RA0112 17:00-17:15	Design Research on Electronic Sphygmomanometer for the Elderly Based on Miryoku Engineering Xiao-Jie Wu , Bao-Yi Zhang and Jing-Jing Huang Xiamen University of Technology, China

Closing Ceremony & Awards

闭幕式 & 会议颁奖

(线上)

April 23rd, 18:00-18:20

Zoom ID: 850 7469 1857

Link: <https://us02web.zoom.us/j/85074691857>

Presenters Index

Presenter's Name	Page	Presenter's Name	Page
A		Jing Chang	20
Andreas P Sandiwan	28	Joselito Flores Jr	26
Ao Wu	29	K	
Ao Zhang	31	Konkala Manisha	28
Aoyu Zheng	29	L	
Arup Deka	30	Liangdong Wu	29
Ananya S Kudaloor	28	Lingtao Wei	22
B		Longfei Yue	20
Bowen Cheng	23	Lunfei Liang	28
C		Luyao Chao	26
Chen Li	22	Luz Condori Pacori	26
Chih-Keng Chen	24	M	
Chuhan Zhou	21	Marcelo Miguel De la Cruz Calderon	26
Conrado Ostia Jr	26	Maycol Alberth Inga Huanay	27
D		Menghua Zhang	19
Dan Huang	24	Miaomiao Tian	23
Dan Jin	29	N	
Dan Zhang	21	Ning Wang	21
Dimuthu Kodippili Arachchige	26	P	
H		Pei Yin	19
Han Wu	23	Pengcheng Lin	19
Hanwen Zhang	19/22	S	
Han-Xuan Liu	31	Sanjaya Mallikarachchi	26
Hao Wang	30	Shawn Jun Jie Pang	27
Haoran Han	20	Shouzheng Yuan	27
Haoyuan Wen	21	Shujin Yuan	30
F		Siyu Wu	29
Fawad Farooq Ashraf	28	Sujun Zhang	29
J			
Jeffrey Casem	27		

Presenter's Name	Page	Presenter's Name	Page
W		Yong-Li Yan	22
Wang Jinjie	30	Yongyi Chen	21
Weiwei Liu	23	Yubing Wang	31
Wei Zhou	27	Yuhang Wu	23
Wenda Yang	29	Yurou Chen	24
Wenfei Wang	20	Yuxin Sun	24
Wenjie Lin	21	Yuze Xu	28
Wenqian Xie	21		
		Z	
X		Zhe Li	31
Xianjin Zhu	28	Zhengshuai Yin	29
Xiao-Jie Wu	31	Zhenhui Ou	30
Xin Li	23	Zhenyong Zhou	28
Xin Wang	27	Zhilong Yu	20
Xinwei Chen	19	Zhuoqing Liu	19
		Zhuoyun Li	22
Y		Zikang Hao	23
Yi Wei	30	Ziniu Wu	30
Yi-Ming Gao	31		

[illegible]