

The 2016 12th World Congress on Intelligent Control and
Automation (WCICA 2016)

FINAL PROGRAM



June 12 – 15, 2016, Guilin, China

WCICA 2016 Program at a Glance (June 12 - 15, 2016)

Sunday, June 12, 2016											
09:00 - 12:00	Registration 08:00 - 20:00	Workshop 1 - 姜钟平: Nonlinear Control of Dynamic Networks: The Small-Gain Approach (Pearl Hall, 明珠厅)						Workshop 2 - 郭雷 (北航): Anti-Disturbance Control: Theory and Applications (Jade Hall, 翡翠厅)			
12:00 - 13:30		Lunch break									
13:30 - 16:30		Workshop 3 - 侯忠生: Model Free Adaptive Control (MFAC): Progress and Applications (Pearl Hall, 明珠厅)						Workshop 4 - 乔红: Brain-Like Intelligent Robots-Cognition, Planning and Motion (Jade Hall, 翡翠厅)			
18:00 - 19:30		Welcome reception									
Monday, June 13, 2016											
09:00 - 09:30	Opening ceremony (Grand Ballroom, 延惠厅)										
09:30 - 10:30	Plenary 1: Smart Optimization Control System for Energy-Intensive Equipments by Tianyou Chai (Chair: Derong Liu)										
10:30 - 11:00	Coffee break										
11:00 - 12:00	Plenary 2: Cooperative Control for Multi-Agent Systems in Microgrid Distributed Generation by Frank Lewis (Chair: Don Wunsch)										
12:00 - 13:30	Lunch break										
Room	Li River Hall 漓江厅	Seven Stars Hall 七星厅	Elephant Trunk Hill Hall 象山厅	Fold Brocade Hall 叠彩厅	Yangshuo Hall 阳朔厅	Lingui Hall 临桂厅	Pearl Hall 明珠厅	Jade Hall 翡翠厅	Amber Hall 琥珀厅	VIP Room VIP室	Poster area 海报粘贴区
13:30 - 15:30	MonN1-1: Modeling, Control and Optimization in Air Transportation System	MonN1-2: Control and Filtering for Distributed Networked Systems	MonN1-3: New Development on Fuzzy Systems and Fuzzy Control	MonN1-4: Nonlinear Systems and Control	MonN1-5: Constrained Control	MonN1-6: Adaptive Control and Learning Control	MonN1-7: Guidance and Navigation	MonN1-8: System Modeling and Identification	MonN1-9: Multi-Agent Systems and Distributed Control	MonN1-10: Data-based Modeling and Control	P1: Poster Session 1
15:30 - 15:50	Coffee break										
15:50 - 17:50	MonN2-1: Advanced Intelligent Control of Autonomous Systems	MonN2-2: New Development on Fuzzy Systems and Fuzzy Control	MonN2-3: Computational Intelligence Based Data-driven Modeling, Optimization and Control	MonN2-4: Pattern Recognition, Image Processing, Machine Learning	MonN2-5: Neural Networks and Control	MonN2-6: Smart Grids	MonN2-7: Biomedical Systems and Biosystems Automation	MonN2-8: Intelligent Transportation Systems	MonN2-9: Big Data Analysis, Compressed Sampling and Visualization	MonN2-10: Intelligent Optimization and Applications	
18:00 - 19:30	Dinner										
Tuesday, June 14, 2016											
Room	Pearl + Jade Hall (明珠+翡翠厅)					Yangshuo + Lingui Hall (阳朔+临桂厅)					
08:30 - 09:30	Semi-plenary 1: Distributed Fault Detection and Isolation for Multi-Agent Systems Using Relative Information by Jie Chen (BIT) (Chair: Derong Liu)					Semi-plenary 2: Intelligence in the Cyber-Physical Revolution by Cesare Alippi (Chair: Xinpin Guan)					
09:30 - 10:00	Coffee break										
10:00 - 11:00	Semi-plenary 3: Optimal Control Using Adaptive Dynamic Programming: Fundamental Theory and New Development by Huaguang Zhang (Chair: Yaochu Jin)					Semi-plenary 4: Data Analytics Challenges in Biomedical Engineering by Don Wunsch (Chair: Zhong-Ping Jiang)					
11:00 - 12:00	Semi-plenary 5: Quasi-linear Systems with Spacecraft Control Applications by Guangren Duan (Chair: Yangmin Li)					Semi-plenary 6: Controlling Physical Human-Robot Interaction by Milos Zefran (Chair: Dongbin Zhao)					
12:00 - 13:30	Lunch break										
13:30 - 15:30	TueN1-1: Modeling, Identification and Control of Distributed Parameter Systems (DPS)	TueN1-2: Quantum Control and Quantum Cybernetics	TueN1-3: Application Oriented Image Analysis in Robot Vision and Machine Vision	TueN1-4: TJ Tarn Best Theoretical Paper Award	TueN1-5: TJ Tarn Best Application Paper Award	TueN1-6: TJ Tarn Best Student Paper Award	TueN1-7: Steve and Rosalind Hsia Best Biomedical Paper Award	TueN1-8: SUPCON Best Paper Award on Industrial Automation	TueN1-9: Mobile Robots	TueN1-10: Service Robots and Intelligent Society	P2: Poster Session 2
15:30 - 15:50	Coffee break										
15:50 - 17:50	TueN2-1: Modeling, Control and Optimization of Electrical Traction System in High-speed	TueN2-2: Application Oriented Image Analysis in Robot Vision and Machine Vision	TueN2-3: Control and Filtering for Distributed Networked Systems	TueN2-4: Control Systems	TueN2-5: System Modeling and Networked Control Systems	TueN2-6: Computational Intelligence and Applications	TueN2-7: Pattern Recognition, Image Processing, Machine Learning	TueN2-8: Fuzzy Systems and Neural Networks	TueN2-9: Intelligent Automation Systems	TueN2-10: Intelligent Robots and Brain-like Intelligence	
18:00 - 19:30	Dinner										
Room	Pearl Hall (明珠厅)					Yangshuo Hall (阳朔厅)					
19:30 - 21:30	论坛1: 如何做好科研? (主持人: 乔红) 关新平、郭雷 (北航)、姜钟平、阳春华					论坛2: 基金委、国际杂志、国际学术组织 (主持人: 刘德荣) 柴天佑、陈俊龙、金耀初					
Wednesday, June 15, 2016											
08:30 - 09:30	Plenary 3: Compressive Feedback Control: Theory and Applications by Ning Xi (Chair: Hong Qiao)										
09:30 - 10:00	Coffee break										
10:00 - 12:00	"Research Trend of Control and Automation" plenary panel with panelists: Ji-feng Zhang, Ning Xi, Gary Feng, Tong Zhou, and Tielong Shen (Chairs: Jie Huang, Zhongsheng Hou, and Xinpeng Guan)										
12:00 - 13:30	Lunch break										
13:30 - 15:30	WedN1-1: Autonomous Control of Unmanned Aircraft Systems	WedN1-2: Computational Intelligence Based Data-driven Modeling, Optimization and Control	WedN1-3: Modeling, Control and Optimization in Air Transportation system	WedN1-4: Linear Systems and Control	WedN1-5: Computational Intelligence and Applications	WedN1-6: Optimization for Decision Making Systems	WedN1-7: Control Theory	WedN1-8: Intelligent Robots and Brain-like Intelligence	WedN1-9: Data-based System Performance Analysis	WedN1-10: Complex Networks	P3: Poster Session 3
15:30 - 15:50	Coffee break										
15:50 - 17:50	WedN2-1: Operator Based Robust Nonlinear Control and Its Application	WedN2-2: Real-time Computing, Perception, Decision, and Interaction for Autonomous Robots and Robot Operating System	WedN2-3: Quantum Control and Quantum Cybernetics	WedN2-4: Application Oriented Image Analysis in Robot Vision and Machine Vision	WedN2-5: Computational Intelligence and Applications	WedN2-6: Pattern Recognition, Image Processing, Machine Learning	WedN2-7: Sensors, Sensor Networks, Sensing and Signal Processing	WedN2-8: Industrial Robots and Intelligent Manufacturing	WedN2-9: Unmanned Aerial Vehicles and Autonomous Systems	WedN2-10: Optimal Control Systems	
18:00 - 20:00	Award banquet and WCICA 2018 TJ Tarn Best Theoretical Paper Award, TJ Tarn Best Application Paper Award, TJ Tarn Best Student Paper Award Best Poster Paper Award, Steve and Rosalind Hsia Best Biomedical Paper Award SUPCON Best Paper Award on Industrial Automation, He-Pan-Qing-Yi Best Paper Award Invitation from WCICA 2018 (Yunhui Liu)										

Welcome Message from the General Chair

It is our great honor to welcome you to the 2016 12th World Congress on Intelligent Control and Automation (WCICA 2016), to be held in Guilin, China, June 12–15, 2016. Guilin is a city in the northeast of Guangxi Zhuang Autonomous Region of southern China, sitting on the west bank of Lijiang River. Guilin is China's shining pearl, with verdant mountains, elegant waters, magnificent crags, and fantastic caverns. All the participants of WCICA 2016 will have a technically rewarding experience as well as memorable experiences in this great city.

WCICA 2016, as a sequel of WCICA 2014 (Shenyang, China), aims to provide a forum for scholars all over the world to present their achievements in the fields of intelligent control and automation. In addition to the contributed papers, several distinguished scholars (Professor Tianyou Chai, Professor Frank L. Lewis, Professor Ning Xi, Professor Jie Chen, Professor Cesare Alippi, Professor Huaguang Zhang, Professor Donald Wunsch, Professor Guangren Duan and Professor Milos Zefran) were invited to give plenary or semi-plenary lectures, providing us with recent hot topics, latest developments and novel applications.

WCICA 2016 is sponsored by Chinese Academy of Sciences, University of Science and Technology Beijing, IEEE Control Systems Society, IEEE Robotics and Automation Society, Chinese Association of Automation, and IEEE/CAA Journal of Automatica Sinica. We wish to express our appreciation to all the individuals who have contributed to WCICA 2016 in a variety of ways. Special thanks are extended to our colleagues for their thorough review of all submissions, which is vital to the success of this conference, and also to the members of the organizing committee and our volunteer students who have dedicated their time and efforts to planning, promoting, organizing and helping with the conference. Our special thanks go to distinguished plenary lecturers, as well as all the authors for contributing their latest research work to the conference, and to all the participants in making WCICA 2016 a memorable event.

Enjoy the congress and enjoy your stay in Guilin!



Derong Liu
WCICA 2016 General Chair

Welcome Message from the Program Chair

Welcome to WCICA 2016! The 12th World Congress on Intelligent Control and Automation is being held from June 12 to 15 in Guilin, China. The international conference has a long tradition of focusing on both the theory and the applications of control and automation. This year is no exception. The scope of this year's conference includes control theory and systems, intelligent automation systems, big data automation, engineering optimization, sensing, modeling and analysis, and intelligent robots and brain-like intelligence.

WCICA 2016 received 759 submissions from 17 countries and regions. Each submitted paper was carefully reviewed by at least three expert reviewers. Based on the rigorous peer-review process and hard work of the corresponding program committee members and reviewers, 610 papers have been accepted for either oral or poster presentation at the conference. Papers presented at the conference cover a broad spectrum of fields, ranging from control and systems theory, intelligent automation systems, big data automation, engineering optimization, sensing, modeling and analysis, intelligent robots and brain-like intelligence, to high performance computing. The program booklet provides materials about the location of the session rooms, maps of the congress venue as well as the day-by-day program and abstracts of the plenary and invited lectures.

We would like to express our sincere appreciation and thanks to the technical program committee members and the reviewers for their great efforts in the paper review process, and also to the members of the organizing committee and the volunteers who have dedicated a lot of time and efforts to promoting the conference. We would like to thank all the invited panelists and speakers, as well as all the authors for sharing their ideas, insights and latest research results with the WCICA community. We would also like to thank all the participants and sponsors for their great contributions and strong supports to WCICA 2016.

On behalf of the Program Committee, we thank you for attending WCICA 2016 and hope that you enjoy the conference. Finally, if your travel plans permit, we would hope you to stay beyond the conference to enjoy visiting Guilin and the rest of China. We wish you a great conference and enjoyable visits in Guilin, China.

Welcome to Guilin!



Hong Qiao
WCICA 2016 Program Chair

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IEEE/CAA JAS Call for Papers

WCICA 2018 Call for Papers

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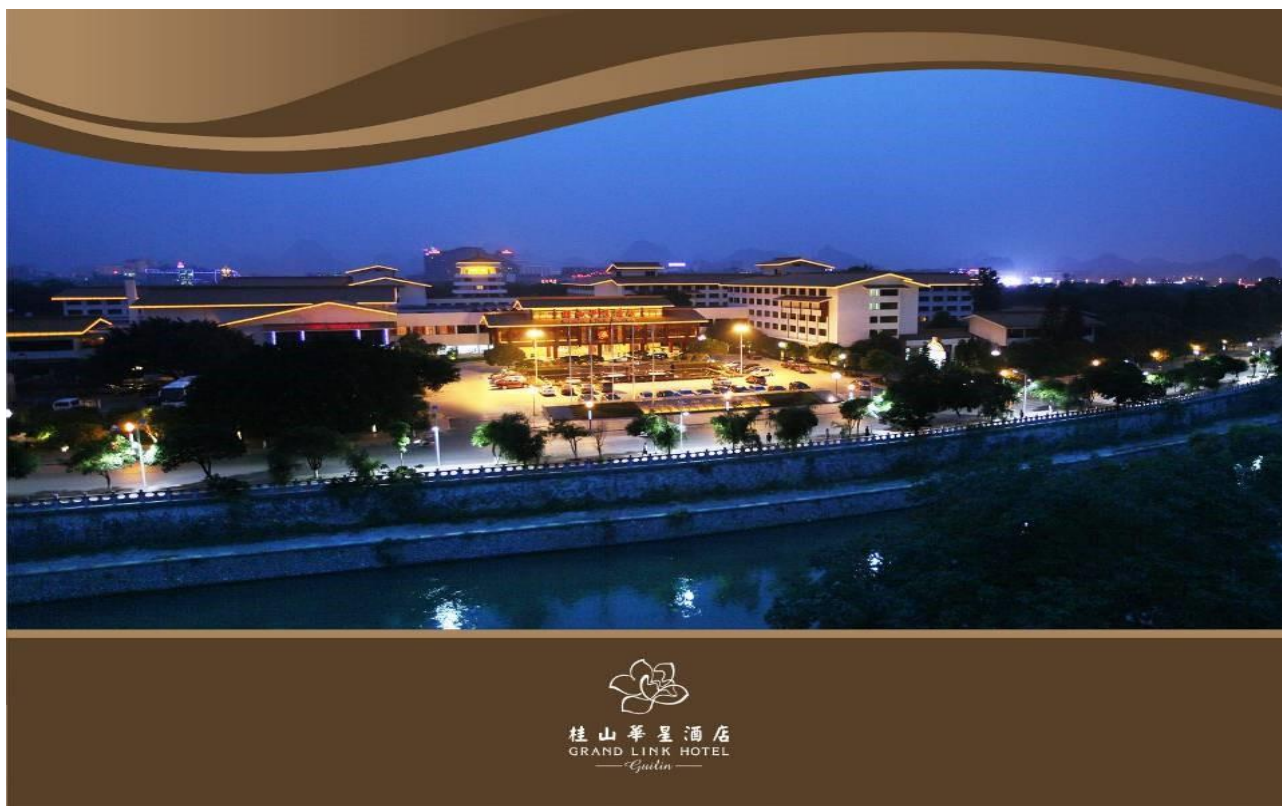
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Conference Venue

WCICA 2016 will be held at the Grand Link Hotel Guilin. The Grand Link Hotel Guilin is located on the bank of Lijiang River in the beautiful city of Guilin which enjoys the fame as “having the best scenery in China”. Facing the city badge, the Elephant Trunk Hill crosses the river and is adjacent to the Seven Star Park and Zizhou Island Park. It is only 10 minutes’ ride to the downtown, the railway station, the Hi-tech Industrial Zone and International Exhibition & Conference Center, and 45 minutes’ to Guilin Liangjiang International Airport. It is the only luxury garden resort hotel on the Lijiang River bank and near the gardens.



Hotel Address:

Grand Link Hotel Guilin
42 Chuanshan Road, Guilin, China
Tel: +86 773 3199999

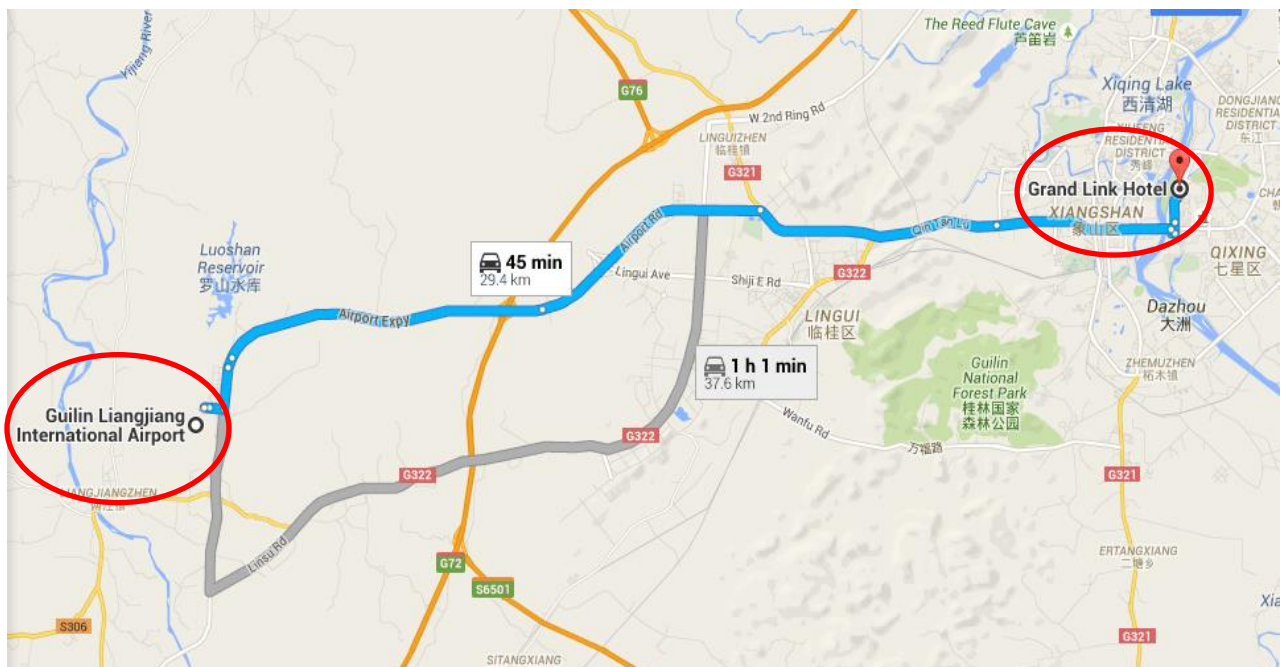
酒店地址:

中国广西壮族自治区桂林市穿山路 42 号
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电话: (0773) 3199999

Location of the Grand Link Hotel Guilin

It is only 10 minutes' ride to the downtown and the railway station, and 45 minutes' to Guilin Liangjiang International Airport.

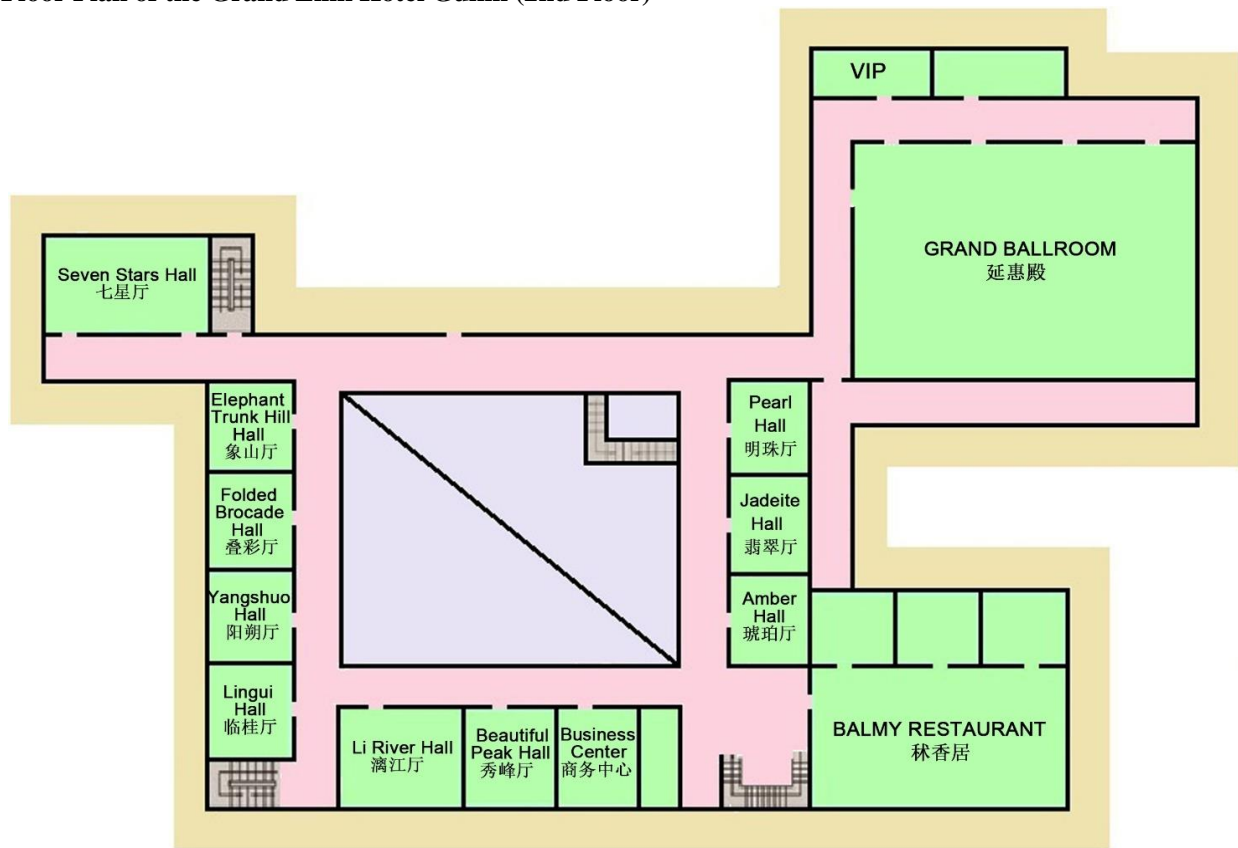
	酒店 From	距离 Distance (km)	时间 Time (mins)	方式 By
机场	Airport	31	45	乘车 By Car
火车站	Railway Station	5	10	乘车 By Car
阳朔	Yangshuo	55	70	乘车 By Car
高新产业园	Hi-Tech Park	5	10	乘车 By Car
七星公园	Seven Star Park	1	10	步行 On Foot
訾洲公园	Zizhou Island Park	0.5	5	步行 On Foot
漓江	Lijiang River	5	10	步行 On Foot
象山公园	Elephant Trunk Hill Park	5	10	乘车 By Car





There are 11 meeting rooms with a total area of 1,400 square meters, which can accommodate 100–800 people. It is the ideal place for holding a big conference like WCICA. The floor plan of the Grand Link Hotel Guilin is shown as follows.

Floor Plan of the Grand Link Hotel Guilin (2nd Floor)



Registration Information

The WCICA 2016 registration desk, located in the Lobby of Grand Link Hotel Guilin, will be open during:

- June 12, 2016 (Sunday) 08:00–20:00
- June 13, 2016 (Monday) 08:00–17:00
- June 14, 2016 (Tuesday) 08:00–17:00
- June 15, 2016 (Wednesday) 08:00–12:00

Each full registration includes a welcome reception ticket, conference attendance, a banquet ticket, and the conference CD-ROM proceedings.

Additional sets of CD-ROM proceedings and hardcopy proceedings may be purchased at the registration desk (50USD/330RMB for CD-ROM proceedings and 100USD/650RMB for one volume of hardcopy proceedings). In addition, each additional banquet ticket costs 80USD/500RMB.

Exhibition Information

The exhibition will be held from June 13, 2016 (Monday) to June 15, 2016 (Wednesday) with the following schedule:

- June 12, 2016 (Sunday) 14:00–17:00 Exhibit booth setup
- June 13, 2016 (Monday) 08:00–17:00
- June 14, 2016 (Tuesday) 08:00–17:00
- June 15, 2016 (Wednesday) 08:00–15:00
- Exhibition Area: 2nd floor by meeting rooms

Instructions for Oral and Poster Presentations

Oral Presentation:

- Oral Presentation Time: 15 minutes (including discussion).
- Each speaker is required to meet his/her session Chair in the corresponding session room 10 minutes before the session starts and copy the slide file (PPT or PDF) to the computer.
- Please note that each session room will be equipped with an LCD projector, a screen, a pointer device, and a laptop or desktop computer with general presentation software such as Microsoft PowerPoint and Adobe Reader preinstalled. Please make sure that your files are compatible and readable with our operation system by using commonly used fonts and symbols. If you plan to use your own computer, please try the connection and make sure it works before your presentation. Make sure to bring your special connectors.

Poster Presentation:

- The author should print the poster slide file by yourself in advance and take it with you to the conference site.
- The conference will provide a poster board (0.9m in width, 1.5m in height) for each poster paper. The boards will be arranged in the order of papers 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 one meter away.
- Please note that during your poster session, the author should stay by your poster paper to explain and discuss your paper with visiting delegates. The members of the Evaluation Committee of WCICA 2016 Best Poster Award will also be there to inspect poster papers.

History of WCICA

Congress	Date and Venue	Organizer
12th WCICA	Guilin, China June 12–15, 2016	Chinese Academy of Sciences
11th WCICA	Shenyang, China June 29–July 4, 2014	Northeastern University
10th WCICA	Beijing, China July 6–8, 2012	Academy of Mathematics and Systems Science
9th WCICA	Taipei, China June 21–25, 2011	National Taiwan University
8th WCICA	Jinan, China July 6–9, 2010	Shandong University
7th WCICA	Chongqing, China June 25–27, 2008	Chongqing University
6th WCICA	Dalian, China June 21–23, 2006	Dalian University of Technology and Northeastern University
5th WCICA	Hangzhou, China June 14–18, 2004	Zhejiang University
4th WCICA	Shanghai, China July 10–14, 2002	Shanghai Jiao Tong University
3rd WCICA	Hefei, China June 29–July 2, 2000	University of Science and Technology of China
2nd WCICA	Xi'an, China June 23–27, 1997	Xi'an Jiaotong University
1st WCICA	Beijing, China August 26–30, 1993	Tsinghua University

Plenary Lectures

Plenary Lecture I

Smart Optimization Control System for Energy-Intensive Equipments

Tianyou Chai

Northeastern University, China

Abstract – China has abundance of mineral resources such as magnesite, hematite and bauxite, which constitute a key component of its economy. The relatively low grades, and widely varying and complex compositions of raw extracts, however, pose difficult processing challenges including specialized equipment with excessive energy demands. The energy intensive furnaces together with widely uncertain features of the extracts form hybrid complexities of the system, where the existing modeling, optimization and control methods have met only limited success. Currently, the mineral processing plants generally employ manual control and are known to impose greater demands on energy, while yielding unreasonable waste and poor operational efficiency. The key solution to solve these problems is to make the control systems of energy intensive equipment become CPS. CPS for energy intensive equipment is a smart optimal control system.

This talk presents syntheses and implementations of a smart optimal control system for the energy intensive processing equipment. The talk will focus on three main functions of the proposed smart optimal control system: (i) process control; (ii) operational optimization control; and (ii) operational conditions diagnostics and self-healing control. The design of a novel data-driven dual closed-loop intelligent optimal operational control will be described for realizing these primary functions.

The data-driven dual closed-loop control employs a two-layer structure: (i) an intelligent optimal control layer for identification of optimal set points of control loops which takes functions of target indices associated with energy saving, product yield, product quality and efficiency as the optimization index, and the set points as the decision variables; and (ii) a set point tracking intelligent control layer focusing on a virtual unmodeled dynamics compensation based controller.

This talk introduces a hybrid simulation system for operational optimization and control of complex industrial processes developed by our team. Simulations to electric magnesium melting furnace for magnesia production industry are used to demonstrate the effectiveness of the proposed method.

This talk also introduces the smart embedding control system of electric magnesium melting furnace developed by our team adopting the novel data-driven dual closed-loop intelligent optimal operational control algorithm proposed. It has been successfully applied to the largest magnesia production enterprise in China, resulting in great returns. Issues for future research on the smart optimization control system are outlined in the final section.



Tianyou Chai was born in Lanzhou, China. He received the B.A. degree in automation from Northeastern University of Electric Power, Jilin, China in 1980, the M.S. and Ph.D. degrees in control theory and engineering in 1983 and 1985, respectively, from Northeastern University, Shenyang, China.

Since 1985, he has been with the Center of Automation at Northeastern University, where he became a Professor in 1988. He serves as a director of the National Engineering and Technology Research Center of Metallurgical Automation since 1997; director of Key Laboratory of Integrated Automation of Process Industry, Ministry of Education since 2003; director of Department of Information and Science of National Natural Science Foundation of China since 2010; director of the State Key Laboratory of Synthetical Automation for Process Industries since 2011; and Chair of Academic Committee of Northeastern University since 2011. In 2003, he was elected as a member of Chinese Academy

of Engineering.

He is a Fellow of IFAC and IEEE. He has served as Member of Technical Board of IFAC and Chairman of Coordinating Committee on Manufacturing and Instrumentation of IFAC from 1996 to 1999, a member of Chinese National Disciplinary Appraisal Group since 1992, and Vice-Director of Committee of Experts of Advanced Manufacturing and Automation in National 863 High-Tech Program from 2001-2006.

His main research interests are in modeling, control, optimization and integrated automation of complex industrial processes. He has served extensively as a consultant to industry and government. He has authored or coauthored 3 books, more than 450 technical articles including 176 international journal papers and 280 international conference papers, and holds 14 patents. He has been invited to deliver 41 plenary speeches on international conferences including 21 in IFAC and IEEE hosted conferences.

For his contributions, he has won 4 prestigious awards of National Science and Technology Progress and National Technological Innovation from China, the 2002 Technological Science Progress Award from Ho Leung Ho Lee Foundation, the 2007 Industry Award for Excellence in Transitional Control Research from IEEE Multiple-conference on Systems and Control and the 2010 Yang Jia-Chi Science and Technology Award from Chinese Association of Automation. He received several best paper awards, including Best Paper Award for 2011-2013 from Control Engineering Practice in 2014.

Plenary Lecture II

Cooperative Control for Multi-Agent Systems in Microgrid Distributed Generation

Frank L. Lewis

University of Texas at Arlington, USA

Abstract – With aging power distribution systems and new opportunities for renewable energy generation, the smart grid and microgrid are becoming increasingly important. Microgrid allows the addition of local loads and local distributed generation (DG) including wind power, solar, hydroelectric, fuel cells, and micro-turbines. Microgrid holds out the hope of scalable growth in power distribution systems by distributed coordination of local loads and local DG so as not to overload existing power grid generation and transmission capabilities. Sample microgrids are smart buildings, isolated rural systems, and offshore drilling systems. Microgrid takes power from the main power grid when needed, and is able to provide power back to the main power system when there is local generation excess.

When connected to the main distribution grid, microgrid receives a frequency reference from grid synchronous generators. Standard operating procedures call for disconnecting microgrid from the main power grid when disturbances occur. On disconnection, or in islanded mode, the absence of rotating synchronous generation leads to a loss of frequency references. After islanding, it is necessary to return microgrid DG frequencies to synchronization, provide voltage support, and ensure power quality.

In this talk we develop a new method of synchronization for cooperative systems linked by a communication graph topology that is based on a novel distributed feedback linearization technique. This cooperative feedback linearization approach allows for different dynamics of agents such as occur in the DGs of a microgrid. It is shown the new cooperative protocol design method allows for frequency synchronization, voltage synchronization, and distributed power balancing in a microgrid after a grid disconnection islanding event. The distributed nature of the cooperative feedback linearization method is shown to lead to sparse communication topologies that are more suited to microgrid control, more reliable, and more economical than standard centralized secondary power control methods.



Frank L. Lewis is a Member of National Academy of Inventors. Fellow IEEE, Fellow IFAC, Fellow U.K. Institute of Measurement & Control, PE Texas, U.K. Chartered Engineer. UTA Distinguished Scholar Professor, UTA Distinguished Teaching Professor, and Moncrief-O'Donnell Chair at the University of Texas at Arlington Research Institute. Qian Ren Thousand Talents Consulting Professor, Northeastern University, Shenyang, China. IEEE Control Systems Society Distinguished Lecturer. Bachelor's Degree in Physics/EE and MSEE at Rice University, MS in Aeronautical Engineering at Univ. W. Florida, Ph.D. at Ga. Tech. He works in feedback control, reinforcement learning, intelligent systems, and distributed control systems. He is author of 6 U.S. patents, 316 journal papers, 406 conference papers, 20 books and 12 journal special issues. He received the Fulbright Research Award, NSF Research Initiation Grant, ASEE Terman Award, Int. Neural Network Soc. Gabor Award 2009, U.K. Inst. Measurement & Control Honeywell Field Engineering Medal 2009. Received IEEE Computational Intelligence Society Neural Networks Pioneer Award 2012. Distinguished Foreign Scholar at Nanjing Univ. Science & Technology. Project 111 Professor at Northeastern University, China. Distinguished Foreign Scholar at Chongqing Univ. China. Received Outstanding Service Award from Dallas IEEE Section, selected as Engineer of the Year by Ft. Worth IEEE Section. Listed in Ft. Worth Business Press Top 200 Leaders in Manufacturing. Received the 2010 IEEE Region 5 Outstanding Engineering Educator Award and the 2010 UTA Graduate Dean's Excellence in Doctoral Mentoring Award. Elected to UTA Academy of Distinguished Teachers 2012. Texas Regents Outstanding Teaching Award 2013. He served on the NAE Committee on Space Station in 1995.

Plenary Lecture III

Compressive Feedback Control: Theory and Applications

Ning Xi

The University of Hong Kong, China

Abstract – The compressive feedback means the sensory information in the feedback of a control system is compressed or obtained from compressive sensing. Compressive sensing is a newly developed sensing method in which the key information can be obtained based on limited sampling. The compressive feedback method can significantly reduce sensing time. Therefore, high performance real time control can be achieved even for the systems with slow sensory feedbacks. The key question is how to use such compressive information to control a real-time system. In this talk, following a brief introduction of compressive sensing, the theoretical foundation as well as implementation methods for modeling, analysis and design of compressive feedback control systems will be presented. Applications, including robot control and high precision nano motion control, will be discussed. The experimental testing results will also be presented.



Ning Xi received his D.Sc. degree in Systems Science and Mathematics from Washington University in St. Louis, Missouri, USA in December 1993. He is the Chair Professor of Robotics and Automation in the Faculty of Engineering and the Director of the Emerging Technologies Institute at the University of Hong Kong. Before he joined the University of Hong Kong in 2016, he was a University Distinguished Professor, the John D. Ryder Professor of Electrical and Computer Engineering and the Director of Robotics and Automation Laboratory at Michigan State University. Dr. Xi received the Best Paper Award in IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) in August, 1995, and the Best Paper Award in the 1998 Japan-USA Symposium on Flexible Automation. Dr. Xi was awarded the first Early Academic Career Award by the IEEE Robotics and Automation Society in May, 1999. He also received the Best Paper Award of IEEE Transactions on Automation Science and Engineering in 2007. Dr. Xi was awarded SPIE Nano Engineering Award in 2007. In addition, he is a recipient of US National Science Foundation CAREER Award. Dr. Xi is a fellow of IEEE.

Semi-Plenary Lecture I

Distributed Fault Detection and Isolation for Multi-Agent Systems Using Relative Information

Jie Chen

Beijing Institute of Technology, China

Abstract – Automatic fault detection and isolation for multi-agent systems is of growing importance with the growth of systems' complexity and intelligence. But their inherent decentralized structure makes it more challenging for the lack of a central node monitoring the whole system's activities. In this talk, we will discuss the distributed fault detection and isolation strategy for a class of linear multi-agent systems using only relative information. First, by applying a series of model transformations, a new fault detection model which can estimate the neighbors' nominal outputs by solving linear system equations is created. The distributed FDI strategy based on the proposed model is then designed. After that, a novel event-triggered communication framework is proposed to improve the reliability of the fault detection result.



Jie Chen is currently the Vice President of Beijing Institute of Technology, the head of the State Key Laboratory of Intelligent Control and Decision of Complex Systems, and the leader of an innovative research group of the Natural Science Foundation of China (NSFC). He also serves as the Vice President of the Chinese Association of Automation (2013-present), the Managing Editor for the Journal of Systems Science and Complexity (2014-present), and Editorial Board Member and Associate Editor for many international journals. His main research interests include multi-objective optimization and decision-making of complex system, intelligent control, constrained nonlinear control, and optimization methods. He has authored/co-authored 3 monographs and more than 100 research papers. He also holds 56 patents of invention. He is a Distinguished Young Scholar honored by NSFC and a ChangJiang Scholar Distinguished Professor Awarded by the Ministry of Education China. He is also a senior member of IEEE. He received the National Natural Science Award of China (2nd Grade) in 2014, and the National Science and Technology Progress Award of China (2nd Grade) twice in 2009 and 2011, respectively.

Semi-Plenary Lecture II

Intelligence in the Cyber-Physical Revolution

Cesare Alippi

Politecnico di Milano, Italy and Università della Svizzera Italiana, Switzerland

Abstract – The emergence of non-trivial embedded sensor units and cyber-physical systems has made possible the design and implementation of sophisticated applications where large amounts of real-time data are collected, possibly to constitute a big data picture as time passes. Within this framework, intelligence mechanisms play a key role to provide systems with advanced functionalities. Intelligent mechanisms are needed to guarantee appropriate performances within an evolving, time-invariant environment, optimally harvest and manage the residual energy, identify faults within a model-free framework, solve the compromise between output accuracy and computational complexity.

The talk will show how the above aspects of intelligence are needed to boost the next generation of cyber-physical-based and Internet of Things applications, generation whose footprint is already around us.



Cesare Alippi received the degree in electronic engineering cum laude in 1990 and the Ph.D. in 1995 from Politecnico di Milano, Italy. Currently, he is a Full Professor of information processing systems with the Politecnico di Milano. He has been a visiting researcher at UCL (UK), MIT (USA), ESPCI (F), CASIA (CN), USI (CH), A*STAR (SIN).

Alippi is an IEEE Fellow, Vice-President Education of the IEEE Computational Intelligence Society, member of the Board of Governors of the International Neural Networks Society, Associate editor (AE) of the IEEE Computational Intelligence Magazine, past AE of the IEEE-Trans Instrumentation and Measurements, IEEE-Trans. Neural Networks, and member and Chair of other IEEE committees.

In 2016, he received the INNS Gabor Award and the IEEE Transactions on Neural Networks and Learning Systems outstanding paper award; in 2004 the IEEE Instrumentation and Measurement Society Young Engineer Award; in 2011 has been awarded Knight of the Order of Merit of the Italian Republic; in 2013 he received the IBM Faculty Award.

Among the others, Alippi was General Chair of the International Joint Conference on Neural Networks (IJCNN) in 2012, Program Chair in 2014, Co-Chair in 2011 and General Chair of the IEEE Symposium Series on Computational Intelligence 2014. Current research activity addresses adaptation and learning in non-stationary environments and intelligent embedded systems. Alippi holds 5 patents, has published in 2014 a monograph with Springer on “Intelligence for embedded systems” and (co-)authored about 200 papers in international journals and conference proceedings.

Semi-Plenary Lecture III

Optimal Control Using Adaptive Dynamic Programming: Fundamental Theory and New Development

Huaguang Zhang
Northeastern University, China

Abstract – It is known that dynamic programming is a powerful tool in solving the optimal control problems based on the principle of optimality. However, it is often computationally untenable to run true dynamic programming due to the backward numerical process required for its solutions, i.e., the well-known “curse of dimensionality”. In order to overcome this difficulty, adaptive dynamic programming (ADP) is proposed as a promising method, the idea of which is to approximate the optimal solutions successively via iterative algorithms implemented by the neural networks. In this report, we will present some fundamental optimal control theory and recent development of ADP algorithms, which includes as follows: 1) A novel method named off-policy is proposed to solve the model-free problems, which only requires system data with different control inputs rather than the accurate system mathematical models. 2) Given an initial cost function which is not necessarily optimal, the sequences of cost function and control policy are updated through the neural networks based on HJB equation. 3) The iterative sequences of cost function and control policy are rigorously proved to converge to the optimal ones. 4) Considering the unavailability of time delays, we further study the infinite-horizon and finite-horizon optimal control problem for the nonlinear systems with time delays. Some numerical simulation examples are provided to demonstrate the feasibility and effectiveness of these theories and designs.



Huaguang Zhang received the Ph.D. degree from Southeast University, Nanjing, China, in 1991. From 1992 to 1994, he did his postdoctoral research at Northeastern University, Shenyang, China. He has been with Northeastern University since 1991, and is currently as a Full Professor and Ph.D. advisor. He has authored and coauthored over 300 journal and conference papers, four monographs and co-invented more than 50 patents. He has been serving as an Associate Editor of *Automatica* since 2008, an Associate Editor of *IEEE Transactions on Neural Networks* since 2010, an Associate Editor of *IEEE Transactions on Cybernetics* since 2007, an Associate Editor of *Neurocomputing* since 2007. In addition, he is a fellow of IEEE, the E-letter Chair of IEEE CIS Society, the former Chair of the Adaptive Dynamic Programming & Reinforcement Learning Technical Committee on IEEE Computational Intelligence Society. Besides those he has been a member of the Neural Systems and Applications (NSA) Committee of IEEE Circuits and Systems Society, a member of the Blind

Signal Processing (BSP) Committee of IEEE Circuits and Systems Society, a member of the Technical Committee on Computational Intelligence of the Systems, Man, and Cybernetics Society since 2007. He was awarded the Outstanding Youth Science Foundation Award from the National Natural Science Foundation Committee of China in 2003. He was named the Cheung Kong Scholar by the Education Ministry of China in 2005. He is a recipient of the IEEE Transactions on Neural Networks Outstanding Paper Award (2012). His current research interests include adaptive dynamic programming, fuzzy system theory, fuzzy control, neural network-based control, adaptive control, chaotic control, complex industry process automation, electric power system automation, motor driving system automation.

Semi-Plenary Lecture IV

Data Analytics Challenges in Biomedical Engineering

Donald Wunsch

Missouri University of Science & Technology, USA

Abstract – Biomedical engineering applications are now generating data at a rate that is increasing even faster than Moore’s Law, just as that Law has come to an end. Thus it is incumbent on those who design intelligent computing techniques to compensate for the bottleneck results. This provides amazing challenges and opportunities for researchers in this fast-growing field.



Donald Wunsch is the Mary K. Finley Missouri Professor of Computer Engineering at Missouri University of Science and Technology. His expertise and training is in neural networks and other areas of computational intelligence, coupled with experience working with biological collaborators on large-scale genomics and biomedical engineering projects. This experience includes applications such as cancer diagnostics and prognostics, microarray data analysis, cell signaling and genetic regulatory networks, epilepsy onset prediction, neural spike sorting, multidisciplinary bioinformatics research, image analysis, automated depression and other mental health assessment, autism research, interpersonal relations assessment, automated ethics analysis, medical literature analysis, risk assessment, human-machine interfaces, explanation capabilities of automated reasoning systems, biomedical instrumentation, theories of learning, theories of motivation and addiction, neural network modeling and more. He has produced 18 Ph.D. recipients in Computer Engineering, Electrical Engineering and Computer Science, and is supervising eight additional Ph.D. Candidates in these fields as well as Systems Engineering. He is also supervising a Fulbright Fellow and two sabbatical faculty visitors. He is an IEEE Fellow, International Neural Networks Society (INNS) Fellow, former INNS President and Senior Fellow, and recipient of an NSF CAREER Award, the Halliburton Award for Excellence in Teaching and Research, the 2015 INNS Gabor Award and the 2016 Missouri University of Science and Technology Faculty External Recognition Award.

Semi-Plenary Lecture V

Quasi-Linear Systems with Spacecraft Control Applications

Guangren Duan

Harbin Institute of Technology, Harbin, China

Abstract – This world really behaves in a nonlinear fashion. Nonlinear systems really govern the dynamical behaviors of most of the practical systems in the world.

Whenever possible, nonlinear system technique is preferred to realize control of a nonlinear system, since it usually guarantees the global stability of the closed-loop system, and hence allows the system to be operated within a wide working range. However, existing nonlinear control approaches are limited and each one is only applicable to a special type of nonlinear systems.

An alternative way in tackling control of nonlinear systems is through linearization. Linear system techniques are popular and have wide applications in various fields, because linear systems theories and techniques are relatively mature, simple and universal. Yet they only guarantee local stability, and are only applicable to those systems which have narrow operating ranges.

Is there an approach which combines the advantages of both the linear and nonlinear approaches? The answer is positive.

Quasi-linear systems are linear in form, but nonlinear in nature. Many nonlinear systems can be represented in quasi-linear forms. Quasi-linear system techniques can often give results which are superior to those given by both pure nonlinear system techniques and linear system techniques.

In this talk, a brief introduction to the direct parametric design approaches for quasi-linear systems is given. It is shown with several types of quasi-linear systems that the approaches have the following advantages:

- result in constant linear closed-loop systems with desired eigenstructure although the open-loop systems are highly nonlinear;
- provide complete degrees of freedom which can be further utilized to achieve additional system properties.

These advantages are demonstrated with certain spacecraft control applications, including space rendezvous control and spacecraft attitude control.



Guangren Duan received his B.S. degree in Applied Mathematics, and both his M.S. and Ph.D. degrees in Control Systems Theory. From 1989 to 1991, he was a post-doctoral researcher at Harbin Institute of Technology, where he became a full professor of control systems theory in 1991. He visited the University of Hull, the University of Sheffield, and also the Queen's University of Belfast, UK, from December 1996 to October 2002. He was selected by the Cheung Kong Scholars Program of the Chinese government in August 2000, elected in 2005 leader of a Cheung Kong Scholar Innovative Team sponsored by the Chinese Ministry of Education, and elected in 2009 leader of an Innovative Research Group sponsored by NSFC. He is the founder and currently the Director of the Center for Control Theory and Guidance Technology at Harbin Institute of Technology, and also Member of the Science and Technology committee of the Chinese Ministry of Education, Vice President of the Control Theory and Applications Committee, Chinese Association of Automation, and Associate Editors of a few international journals.

Prof. Duan is the winner of the 4th Chinese National Youth Award of Science and Technology, the winner of two Chinese National Awards of Natural Sciences, and also winner of the Over-century Talents Program of the Chinese Ministry of Education, and that of the Distinguished Young Scholars Program of NSFC (Natural Science Foundation of China). His main research interests include parametric robust control systems design, LMI-based control systems, descriptor systems, spacecraft control and magnetic bearing systems. He is the author and co-author of 5 books and over 270 SCI indexed publications, with more than 50 appeared in IEEE Transactions.

Semi-Plenary Lecture VI

Controlling Physical Human-Robot Interaction

Milos Zefran

University of Illinois at Chicago, USA

Abstract – Rapid advances in social robotics, humanoids, autonomy and deep learning over the past decade suggest that robot assistants are within reach. However, robots are still unable to effectively collaborate with humans in everyday physical tasks. In this talk, I will describe our research on how to allow robots to physically interact with humans. An application that motivates this work is robot assistants for the elderly, where the robot needs to actively involve the human in Activities of Daily Living (ADLs). I will discuss challenges in obtaining measurements of physical interaction and introduce the ELDERLY-AT-HOME corpus of annotated human-human collaborative multimodal interactions; the corpus is instrumental for understanding how humans perform collaborative tasks and can be used for learning by demonstration. I will then highlight our results on human-robot collaborative manipulation and on robot-human handover, two tasks that frequently occur in ADLs. In both cases, the focus will be on how to control the robot to replicate and possibly improve on how a human helper acts during physical interaction. For collaborative manipulation, I will discuss how to compute the interaction force-thought to be responsible for coordination-and how this force can be used to quantify and in turn control the cooperation. For robot-human handover, I will introduce a novel model that explicitly includes a slipping mode; in turn, the model is used to design a robust controller that makes the handover smooth, yet safe.



Miloš Žefran completed his undergraduate studies in Electrical Engineering and Mathematics at the University of Ljubljana, Slovenia, where he also received a M.S. degree in Electrical Engineering. He received a M.S. degree in Mechanical Engineering and a Ph.D. degree in Computer and Information Science in 1995 and 1996, respectively, from the University of Pennsylvania. From 1997 to 1999, he was a NSF Postdoctoral Scholar at the California Institute of Technology. He then joined Rensselaer Polytechnic Institute. Since 1999, he has been with the Department of Electrical and Computer Engineering at the University of Illinois at Chicago where he is a Professor and the Director of Graduate Studies. In 2008, he was a visiting researcher at the University of Pisa. His research interests are in robotics and control with applications to human-robot interaction, cyber-physical systems, and robot networks. Dr. Žefran's research has been supported by a National Science Foundation (NSF) Career Award (2000) and a number of subsequent NSF awards. He has published over 100 journal and conference papers, and is the Associate Editor for the IEEE Transactions on Control Systems Technology.

Plenary Panel: Research Trends of Control and Automation

Organizers:

- ❖ Jie Huang, Professor, Chinese University of Hong Kong
- ❖ Choh-Ming Li, Professor, Chinese University of Hong Kong
- ❖ Zhongsheng Hou, Professor, Beijing Jiaotong University
- ❖ Xinping Guan, Professor, Shanghai Jiao Tong University

Abstract:

In this plenary panel session, we invite five prominent scholars including Gang Feng, Tielong Shen, Ning Xi, Ji-Feng Zhang, and Tong Zhou to present their viewpoints on research trends of control and automation, and to share their visions of the evolution and development of the control theory and applications. Their presentations will be followed by interactive discussions between the five scholars and the audience of WCICA 2016.

Pre-Conference Workshops

Workshop I

Nonlinear Control of Dynamic Networks: The Small-Gain Approach

Organizer: **Zhong-Ping Jiang**, New York University, USA

Abstract

Physical systems are inherently nonlinear and interconnected in nature. Significant progress has been made on nonlinear control systems in the past three decades. However, new system analysis and design tools that are capable of addressing more communication and networking issues are still highly desired to handle the emerging theoretical challenges underlying the new engineering problems. As an example, small quantization errors may cause the performance of a “well-designed” nonlinear control system to deteriorate.

The purpose of this half-day pre-conference workshop is to introduce a set of novel analysis and design tools to address the newly arising theoretical problems from the viewpoint of dynamic networks. The results are intended to help solve real-world nonlinear control problems, including quantized control, event-based control and distributed control aspects.

This tutorial is based on the authors’ recent research results on nonlinear control of dynamic networks. In particular, it introduces refined nonlinear small-gain results for dynamic networks and their applications in solving the control problems of nonlinear uncertain systems subject to disturbance, quantization error, and other information exchange constraints.

Description of Workshop

Speakers:

- ❖ Tengfei Liu, Northeastern University, China
- ❖ Zhong-Ping Jiang, New York University, USA

Outline:

- ❖ Stability and Stabilization Problems of Dynamic Networks
- ❖ Input-to-State Stability
- ❖ The Nonlinear Small-Gain Theorem
- ❖ Small-Gain Designs
 - Quantized Nonlinear Control
 - Event-Based Control
 - Distributed Nonlinear Control

Workshop II

Brain-Like Intelligent Robots – Cognition, Planning and Motion

Organizer: **Hong Qiao**, Chinese Academy of Sciences, China

Abstract

Robotics has been a research hotspot for next generation of technology revolution. Although great developments have been made in recent years, robotics still has many technical bottlenecks. At present, it becomes a main concern for the governments, academia and industry on how to make a significant leap of research and develop key technologies for next generation robots.

As a promising direction of next generation robotics, brain-like intelligent robotics is an interdisciplinary research area integrating various research fields such as robotics, neuroscience, informatics, mechatronics, and etc. By mimicking the structure, mechanisms and underlying principles of biological systems, especially the perception, cognition, reasoning, planning, motor control and emotion modules, we could build more flexible, harmonious and personalized next generation robots and expand the market of intelligent robots. Furthermore, the related researches could also help humans understand the essence of biological systems and provide computational platforms for neural experiments.

Description of Workshop

Speakers:

- ❖ Wei Wu, Chinese Academy of Sciences, China
- ❖ Peijie Yin, Chinese Academy of Sciences, China
- ❖ Yinlin Li, Chinese Academy of Sciences, China
- ❖ Yongbo Song, Chinese Academy of Sciences, China

Outline:

- ❖ Motor Control Model Mimicking the Central Nervous System and the Peripheral Nervous System
- ❖ Visual Perception Model Mimicking the Primate Visual Cortex
- ❖ Coordinating the Visual Perception and Motor Control for Robot Manipulation
- ❖ Introduction of the Relevant Robot Platforms Integrating Bio-Inspired Algorithms

Workshop III

Model Free Adaptive Control (MFAC): Progress and Applications

Organizer: **Zhongsheng Hou**, Beijing Jiaotong University, China

Abstract

With the development of information sciences and technologies, practical processes, such as chemical industry, metallurgy, machinery, electronics, transportation, and logistics, pose enormous research and technical challenges for control engineering and management due to their size, distributed and multi-domain nature, safety and quality requirements, complex dynamics and performance evaluation, maintenance and diagnosis. Modeling these processes accurately using first principles or identification is almost impossible although these plants produce and store huge amount of impersonal valuable data on the plant and equipment operations in every moment during production. This challenges the existing control theory and technology, and meanwhile urgently pushes scientists and engineers to develop new data driven control and methodology to solve control and optimization issues for these complex practical plants. The high-tech hard/software and the cloud computing enable us to have ability to perform a complex computation real time, which makes the implementation of data driven control and methodology in practice possible. Thus, it would be very significant if we can learn the systems' behaviors and discover the correlation relationship of system variables by making full use of those on-line and off-line process data, and then design a controller directly, predict system states, perform real-time optimization, and realize system control. For this reason, the establishment and development of data-driven control theory and methodology are urgent in both the theory and applications.

Description of Workshop

Speakers:

- ❖ Zhongsheng Hou, Beijing Jiaotong University, China
- ❖ Ronghu Chi, Qingdao University of Science and Technology, China
- ❖ Yuanming Zhu, East China University of Science and Technology, China

Outline:

- ❖ The Dynamic Linearization Technique (DLT) and MFAC for Discrete-Time Nonlinear Systems
- ❖ Controller Dynamic Linearization Based MFAC
- ❖ Dynamic Linearization Based MFAC for Repetitive Systems
- ❖ MFAC for Complex Connected Systems, Modulized Designing with the Model Based Control Methods, and Further Research Topics

Workshop IV

Anti-Disturbance Control: Theory and Applications

Organizer: **Lei Guo**, Beihang University, China

Abstract

Existence of multiple types of disturbances influences the performance of control systems largely in various practical fields. A good amount of applications has shown the potentials of anti-disturbance control methods, especially by using of the disturbance rejection or compensation methods. Among them, the approaches of ADRC, DOBC and CHADC which have been hot research directions recently, since surely they can supply better performance in precision and reliability for many different practical plants. And we are happy that some mentioned approaches were established and developed by Chinese scientists.

However, there are still a lot of confusion and misunderstanding, more research is required to understand the true benefits and shortcomings (or limitations) of these methods. There is still a significant room to improve the design and analysis of these methods. Theoretical research is still well behind the applications in this area. What is the limit of this approach or what kind of uncertainty could not be dealt with by this approach? How to analyze the robust stability and performance for a designed DOBC strategy? Another related question is, for a described level of uncertainty, how to develop a strategy that requires a minimum level of feedback or control bandwidth? Also, there is still lack of software packages for supporting analysis and design process. More software and hardware tools shall be developed to facilitate design and real implementation of these methods. It is expected that more and more applications will be found due to the wide existence of disturbance and uncertainty, for which CHADC may be a desired choice. Furthermore, DOB techniques provide an alternative approach by considering faults as unknown inputs and estimating the size of faults directly.

Description of Workshop

Speakers:

- ❖ Lei Guo, Beihang University, China
- ❖ Yuanqing Xia, Beijing Institute of Technology, China
- ❖ Shihua Li, Southeast University, China
- ❖ Wenchao Xue, Chinese Academy of Sciences, China

Outline:

- ❖ New Design Methods for Complex Systems with Disturbances and Uncertainties
- ❖ Theoretic Research for Some Anti-Disturbance Control Approaches for Complex Systems Including Stability, Robustness and Optimality
- ❖ Comparisons And Unifications for Various Anti-Disturbance Control Methods
- ❖ Applications of Anti-Disturbance Control for Practical Engineering
- ❖ Control for Whole Loop Systems with Multiple Disturbances

Best Paper Award Finalists

1. TJ Tarn Best Theoretical Paper Award

- (1) Boundary Analysis in Block Schemes for Control of Some Multi-Level Quantum Systems
by Yang Ling, Dewen Cao, Yaoxiong Wang, Feng Shuang and Fang Gao
- (2) Modeling and Vibration Control of Flexible Wings with Output Constraint
by Wei He, Tong Lv, Yunan Chen, Xiuyu He and Changyin Sun
- (3) Integrated Translational and Rotational Control for Rendezvous and Docking on Ellipse Orbits
by Han Yan, Shuping Tan and Yongchun Xie
- (4) Minimum Entropy Tracking Control for Non-gaussian Systems Using Proportional-Integral Strategy
by Bo Tian, Yan Wang and Lei Guo
- (5) Time-Varying Group Formation Control for Multi-Agent Systems with Second-Order Dynamics and Directed Topologies
by Xiwang Dong, Qingdong Li, Qilun Zhao and Zhang Ren
- (6) Exponential Stability of Impulsive Differential Systems with Variable Delays
by Huamin Wang, Shukai Duan, Tingwen Huang and Lidan Wang

2. TJ Tarn Best Application Paper Award

- (1) Dynamics Analysis of an Offshore Ship-Mounted Crane Subject to Sea Wave Disturbances
by Yuzhe Qian and Yongchun Fang
- (2) Nonlinear Model Predictive Controller Design for Air System Control of a Gasoline Engine
by You Li, Yunfeng Hu, Shuwen Wang and Hong Chen
- (3) A Diagnosis Scheme for Intermittent Faults in Active Suspension Systems of High Speed Trains
by Rongyi Yan, Xiao He and Donghua Zhou
- (4) Fault Detection Filter and Controller Design for Unmanned Surface Vehicles
by Yulong Wang, Qinglong Han, Tianbao Wang and Chen Peng
- (5) Introducing Projective Transformations into Lunar Image Correspondence for Positioning Large Distance Rover
by Chuankai Liu, Baofeng Wang, Xu Yang and Geshi Tang
- (6) Teleoperation Control of an Exoskeleton Robot Using Brain Machine Interface and Visual Compressive Sensing
by Zhijun Li, Wei He, Chenguang Yang, Shiyuan Qiu, Longbin Zhang and Chunyi Su

3. TJ Tarn Best Student Paper Award

- (1) Optimization-Based Compliance Control Strategy of Redundant Robot for ORU Replacements
by Li Jiang, Xijian Huo, Yiwei Liu and Hong Liu
- (2) Robust Trajectory Tracking Control for a Quadrotor Unmanned Aerial Vehicle Using Disturbance Observer
by Yi Yang, Qingxian Wu and Mou Chen
- (3) 3D Vision Based Fast Badminton Localization with Prediction and Error Elimination for Badminton Robot
by Ziyu Chen, Hong Qiao, Rui Li, Chao Ma, Xiaoqing Li and Konggeng Zeng

- (4) Distributed Robust Attack Detection and Reconstruction for a Class of Uncertain Nonlinear Interconnected CPSs
by Wei Ao, Yongduang Song and Changyun Wen
- (5) Optimal Torque Coordinating Control Strategy Applied in Downshifting Process of a Novel Seamless Automatic Transmission
by Jie Ye, Kegang Zhao and Man Xu
- (6) Partial Blurred Object Segmentation for Non-uniform Motion Degraded Images
by Shaobo Zhang, Sheng Liu, Yiyuan Jiang and Xiaoyan Wang

4. Steve and Rosalind Hsia Best Biomedical Paper Award

- (1) Bogdanov-Takens Bifurcation for a Predator-Prey System with Holling Type IV Function
by Jinling Wang and Jinling Liang
- (2) A Classification-Based Fault Detection Method for Continuous Glucose Monitoring (CGM)
by Guangjian Song, Chunhui Zhao and Youxian Sun
- (3) Model-Free Robust Optimal Feedback Mechanisms of Biological Motor Control
by Tao Bian and Zhongping Jiang
- (4) A Visual Attention Based Convolutional Neural Network for Image Classification
by Yaran Chen, Dongbin Zhao, Le Lv and Chengdong Li
- (5) A Programmable Electrical Stimulator for Suppressing Pathological Tremor
by Wei Xin, Yongsheng Gao, Shengxin Wang and Jie Zhao
- (6) Rapid Detection of Chinese Liquors Using a Portable E-nose Based on C-SVM
by Peifeng Qi, Qinghao Meng, Yaqi Jing, Ming Zeng and Shugen Ma

5. SUPCON Best Paper Award on Industrial Automation

- (1) Robust Hashing Learning via Multi-View Subspace Learning
by Yang Liu, Lin Feng and Shenglan Liu
- (2) FPGA-Based Active Disturbance Rejection Control for Antenna Servo Systems
by Zhiqiang Zuo, Yao Li and Yijing Wang
- (3) Soft Measurement Method for Froth Layer Thickness Based on Multi Visual Features
by Degang Xu, Xiao Chen, Ailian Ma, Yongfang Xie, Chunhua Yang and Weihua Gui
- (4) Optimal Balancing Control of Bipedal Robots Using Reinforcement Learning
by Fang Peng, Lijia Ding, Zhijun Li, Chenguang Yang and Chunyi Su
- (5) Time-Optimal Path Tracking for Coordinated Dual-Robot System Using Sequential Convex Programming
by Pengfei Cao, Yahui Gan, Jinjun Duan and Xianzhong Dai
- (6) Optimization Algorithm of Serial Manipulator Structure Based on Posture Manipulability
by Shiyuan Jia, Yinghong Jia and Shijie Xu

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Monday, June 13, 1:30PM–3:30PM

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- 1:30PM *Safety Risk Management Strategy for Airline Operation Control*
Rui Yang, Tong Li, Yafen Hu and Yan Li
- 1:45PM *Performance Analysis of FFHBFSK Using Division Combining Receiver in GPS System*
Li Deng, Kaijun Xu, Qin Wang and Jingzhou Sun
- 2:00PM *Aircrafts Conflict Resolution Using Differential Evolution*
Dong Han, Xuejun Zhang and Xueyuan Li
- 2:15PM *Behavior Form Factor in Abnormal Detection Using Cadet's Training Operation Data*
Kaijun Xu
- 2:30PM *Analysis and Modeling for the ELF Atmospheric Noise Using a Low-Temperature Superconducting Receiver*
Huan Hao, Huali Wang and Liang Chen
- 2:45PM *A Study of 4D Trajectory Prediction Based on Machine Deep Learning*
Xiangmin Guan, Renli Lv, Liang Sun and Yang Liu
- 3:00PM *Path Planning for Unmanned Aerial Vehicle under Geo-Fencing and Minimum Safe Separation Constraints*
Yang Liu, Renli Lv, Xiangmin Guan and Jie Zeng
- 3:15PM *CO₂ Emission of Chinese Airlines*
Liang Sun, Lin Chen, Xiangmin Guan, Renli Lv, Fengtao Liu and Rui Yang

Special Session: MonN1-2 Control and Filtering for Distributed Networked Systems, Chair: Qinglong Han and Chen Peng, Room: Conference Room 3 (Seven Stars Hall).....68

- 1:30PM *Adaptive Fault Tolerant Control of Linearized Aircrafts against Actuator Faults and Time-Delays*
Xiaozheng Jin
- 1:45PM *Event-Triggered Network-Based Control of Discrete-Time Singular Systems*
Qiyi Xu, Yijun Zhang, Shunyuan Xiao and Baoyong Zhang
- 2:00PM *Two-Player Zero-Sum Games for Leader-Follower Consensus of Linear Multi-Agent Systems with Unknown Dynamics*
Chunbin Qin, Hui Chen, Jun Wang, Dehua Zhang, Yingchun Wang and Xianxing Liu
- 2:15PM *Distributed Reliable L_2 - L_∞ State Estimation for Discrete-Time Delayed Neural Networks with Missing Measurements*
Hao Zhang, Huaicheng Yan, Mengling Wang and Hongbo Shi
- 2:30PM *Dynamic Formation and Obstacle Avoidance Control for Multi Robot System*
Shenping Xiao, Lei Feng, Honghai Lian and Bowen Du
- 2:45PM *A Brief Survey on Recent Results of Event-Triggered Control and Filtering for Networked Systems*
Xianming Zhang, Qinglong Han and Yulong Wang
- 3:00PM *Stability Analysis of a Class of Microgrid with Wireless Network Delays*
Weihua Deng and Pengfei Chen
- 3:15PM *Improved Neural Network Models for Coordinated Controller Design of Supercritical Coal-Fired Power Generating Unit*
Yanna Xi, Yinsong Wang and Kaibing Song

Special Session: MonN1-3 New Development on Fuzzy Systems and Fuzzy Control, Chair: Baoyong Zhang and Xiangpeng Xie, Room: Conference Room 4 (Elephant Trunk Hill Hall).....69

- 1:30PM *Observer-Based Output Feedback Control for T-S Fuzzy Time-Delay Systems*
Tao Zhao and Guan hong Cheng
- 1:45PM *Fuzzy Fault-Tolerant Attitude Tracking Control for Mars Entry Vehicle under Partial Loss of Actuator Effectiveness*
Furong Lei, Bin Zhang and Tao Li
- 2:00PM *FCM Texture Image Segmentation Method Based on the Local Binary Pattern*
Yu Tian, Yibing Li, Dandan Liu and Renhuan Luo
- 2:15PM *Optimal Fuzzy Logic Based Energy Management Strategy of Battery/Supercapacitor Hybrid Energy Storage System for Electric Vehicles*
Chao Gao, Jian Zhao, Jian Wu and Xiongbo Hao
- 2:30PM *Mathematical Modeling and Decision-Making on Controlling Modes of Technological Objects in the Fuzzy Environment*
Yerbol Ospanov, Batyr Orazbayev, Kulman Orazbayeva, Nurlan Mukataev and Anatoly Demyanenko
- 2:45PM *Short-Term Power Load Forecasting Based on Improved T-S Fuzzy-Neural Network*
Zhen-Lin Yan, Dong-Hui Li, Le-Le Yao and Hong-Wu Xue
- 3:00PM *Adaptive Fuzzy Tracking Control for Switched Stochastic Nonlinear Systems with Input Constraint*
Guozeng Cui and Baoyong Zhang
- 3:15PM *A New Fault Detection Observer Scheme for T-S Fuzzy Systems with Unmeasurable Variables*
Yue Wu, Jiuxiang Dong, Xiaojian Li and Guanghong Yang

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- 1:30PM *PLS-Based Process Analysis for Glycosylation Reaction*
Liming Liu, Yuhan Nan, Jing Wang, Jingjing Zhang, Jinglin Zhou and Haiyan Wu
- 1:45PM *Input-Output Feedback Linearization Control of Uncertain Systems Using Function Approximation Techniques*
An-Chyau Huang and Shang-Yun Yu
- 2:00PM *NN-Based Adaptive Stabilization for a Class of Stochastic Nonlinear Systems*
Na Duan, Huifang Min and Hongxu Chu
- 2:15PM *Robust Input-to-Output Stabilization of Nonlinear Systems*
Lijun Zhu, Zhiyong Chen and Xi Chen
- 2:30PM *Active Disturbance Rejection Control of Refrigeration System*
Hongwu Xue, Aiguo Wu, Na Dong and Zhenlin Yan
- 2:45PM *Variable Structure Active-Disturbance Rejection Control for Path Following of Underactuated Ship*
Jun Ning, Tieshan Li, Wei Li and Jian Sun
- 3:00PM *Control and Experiment Study of Elastic Drive System by Immersion and Invariance*
Wei Yao, Lu Wang, Yu Guo, Yifei Wu and Jian Guo
- 3:15PM *Fault Diagnosis for Centrifugal Pumps Using Deep Learning and Softmax Regression*
Wanlin Zhao, Zili Wang, Chen Lu, Jian Ma and Lianfeng Li

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Zhiqiang Zuo, Qingsong Li, Hongchao Li and Yijing Wang
- 1:45PM *Adaptive Excitation Control of Power Systems with Time-Varying Constraints*
Bo Fan, Qinmin Yang, Keyou Wang and Wang Qing
- 2:00PM *Simultaneous Tracking and Stabilization Control for Differential-Drive Mobile Robots with Diamond-Shaped Input Constraints*
Xiaozen Chen, Zhuping Wang, Jin Zhu and Qijun Chen
- 2:15PM *Receding Horizon Stabilization of a Class of Constrained Nonholonomic Systems*
Hui ping Li, Weisheng Yan, Yang Shi, Zhenyuan Fan and Hong Li

- 2:30PM *Predictive Direct Power Control for Rectifier stage of Solid State Transformer*
Baolong Liu, Yabing Zha, Tao Zhang and Shiming Chen
- 2:45PM *A Proportional-Feedforward Position Controller Based on Tracking-Differentiator of PMSM*
Hao Lu, Jianhua Hu, Yunkuan Wang, Jun Zheng, Xiaofei Qin and Xinbo Wang
- 3:00PM *Complex ZNN and GNN Models for Time-Varying Complex Quadratic Programming Subject to Equality Constraints*
Sitong Ding, Min Yang, Mingzhi Mao, Lin Xiao and Yunong Zhang
- 3:15PM *Active Disturbance Rejection Sliding Mode Altitude and Attitude Control of a Quadrotor with Uncertainties*
Hongbo Lu, Xinshan Zhu, Chao Ren, Shugen Ma and Wenjie Wang

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Tiantian Jiang
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- 2:15PM *Friction and Moment Disturbances Compensation for Missile Servo Control System*
Kunfeng Zhang, Kaimin Zhang, Dawei Rao, Tao Lun and Lihua Duan
- 2:30PM *High Accuracy Star Centroid Acquisition Method of Airborne Star Sensor during Daytime*
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- 2:45PM *Optimization on RFID-Enabled CONWIP Control Strategy for Multi-Echelon Inventory of Supply Chain*
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- 3:00PM *Optimal Site Selection of China Railway Data Centers by the PSO Algorithm*
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- 3:15PM *Video-Based Fire Detection with Spatio-Temporal SURF and Color Features*
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- 2:00PM *The Mitigation Control for Engine Performance Deterioration*
Yonghua Wang
- 2:15PM *A Design Method of Robust Optimal PI Controller with Saturation Link for Different Processes*
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- 2:30PM *Attitude Determination of Autonomous Underwater Vehicles Based on Hydromechanics*
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- 2:45PM *A Novel Disturbance Observer for Attitude Control of Flexible Spacecraft*
Zhaohui Wang, Yinghong Jia, Shijie Xu and Guoqi Zhang
- 3:00PM *Stability Analysis of Coupled Map Car-Following Model with Varying Time-Delays of Drivers*
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- 3:15PM *Eye-Gaze Tracking System Based on Particle Swarm Optimization and BP Neural Network*
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- 2:00PM *Zero-Error Tracking Control of Nonlinear Systems with Input Saturation*
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- 2:15PM *An Identification Algorithm without Truncation for Binary-Valued Output Systems*
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- 2:30PM *Order and Parameter Estimation of Linear Systems with a Generalized ADALINE Neural Network*
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- 2:45PM *A Comprehensive Evaluation Model and Its Application in the Assessment of Power Development*
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- 3:00PM *H_∞ Filtering for Networked Control Systems with Limited Communication via Delta Operator*
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- 3:15PM *Modeling and Computationally Efficient Algorithms for Analysis of Battery Equalization Systems*
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- 1:30PM *Formation Control of Arbitrary Shape with No Communication*
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- 1:45PM *Observer-Based Adaptive Containment Control for Multi-Agent Systems with Nonlinear Dynamics under Directed Graphs*
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- 2:00PM *Robust Containment Control for a Class of Heterogeneous Uncertain Nonlinear Multi-Agent Systems*
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- 2:30PM *Identification of Pre-Emergency States in the Electric Power System on the Basis of Machine Learning Technologies*
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- 2:45PM *Multi-Robot Based Odor Source Declaration in 3D Airflow Fields*
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- 3:00PM *An Accurate and Robust Adaptive Motion Shadow Detection Algorithm*
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- 1:45PM *Health Assessment for Rolling Bearing Based on Local Characteristic-Scale Decomposition - Approximate Entropy and Manifold Distance*
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- 2:00PM *Spammer Detection Based on Hidden Markov Model in Micro-Blogging*
Dang Qi, Gao Feng and Yadong Zhou
- 2:15PM *A Framework for Context-Aware Semantic Complex Event Processing*
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- 2:30PM *Comparison of Two Fractal Surface Modeling Methods*
Yang Fu, Zeyu Zheng, Dianzheng Fu and Yiming Tong
- 2:45PM *A Modified-Distance-Based Minimum Spanning Tree Method for Analyzing Hierarchical Structure of Power Generation System*
Dianzheng Fu, Tingting Zhou, Zeyu Zheng, Yang Fu and Yiming Tong

- 3:00PM *A Weighted Heteroscedastic Gaussian Process Modeling via Particle Swarm Optimization*
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- 3:15PM *A New Index in Vehicular Ad-hoc Networks Connectivity Analysis Based on Generalized Packet Loss Rate Model*
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- P102 *Automatic Single-Line Diagram Generation of Distribution Network with Rings Based on GA*
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- P103 *Perceptual Weighting Deep Neural Networks for Single-Channel Speech Enhancement*
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- P104 *Information Fusion Full-Order Kalman Filter for Multisensor Descriptor System*
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- P105 *Fast Adaptive Electrical Capacitance Volume Tomography*
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- P106 *A High-Order Disturbance Observer Based Sliding Mode Velocity Control of Mobile Wheeled Inverted Pendulum Systems*
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- P107 *Traffic Emission Control Based on Emission Pricing and Signal Timing*
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- P108 *Design of Multi-Parameter Embedded Biological Information Measurement System*
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- P109 *Backstepping Sliding Mode Force/Position Control for Constrained Reconfigurable Manipulator Based on Extended State Observer*
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- P110 *Kalman Filtering with Multiplicative and Additive Noises*
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- P111 *Neural Adaptive Dynamic Surface Control of Nonlinear System with Input Saturation and Unknown Function*
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- P112 *A New Efficient Real-Time Arbitrary Colored Ball Recognition Method for a Humanoid Soccer Robot*
Jiteng Mu and Yunxuan Li
- P113 *On Delay-Dependent Stability for Linear Systems with Interval Time-Varying Delays*
Liansheng Zhang, Shuxia Wang and Dianjun Wang
- P114 *Study of Fuel Film Parameter Identification in Gasoline Engine Transient Conditions Based on Weighted Recursive Instrumental Variable Method*
Taixiong Zheng, Ju Tao, Yongfu Li, Bin Yang, Lichen Shi and Rui Tan
- P115 *Application of Optimization Control Based on RBF Neural Network in VSC-HVDC*
Xiumei Zhang, Jiangyang Chen, Yang Liu and Weibo Yu
- P116 *The Non-probabilistic Reliability-Based Design Optimization Based on Imperialistic Competitive Algorithm and Interval Model*
Xiaoning Fan and Zhiyong Cui
- P117 *A Video Saliency Detection Framework Using Spatiotemporal Consistency Optimization*
Yunfei Zheng, Xiongwei Zhang, Tiejong Cao, Lei Bao, Yonggang Hu and Yong Wang
- P118 *A Fast Non-dominated Sorting Algorithm for Real-Time Multi-Objective Particle Swarm Optimization*
Weijian Kong, Tianyou Chai, Jinliang Ding and Yongsheng Ding
- P119 *Design of Interval Type-2 Fuzzy Logic Controller for Mobile Wheeled Inverted Pendulum*
Myonghyok Ri, Jian Huang, Songhyok Ri, HyonSu Yun and ChangSik Kim

- P120 *Design and Implementation of ISA Card for Rotary Inductosyn Signal Processing Based on AD2S1210 and CPLD*
Shuhe Tian, Hui Zhao and Libin Wang
- P121 *The Dredger Cutter Motion Control System Based on ADRC Technology*
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- P122 *Saliency Detection Based on BP-Neural Network*
Pan Duan, Bei Hu, Haiying Sun and Qichang Duan
- P123 *The Fuzzy PID Control Optimized by Genetic Algorithm for Trajectory Tracking of Robot Arm*
Jie Zhao, Long Han, Li Wang and Zongyan Yu
- P124 *Distributed Finite-Time Tracking Control for Second-Order Nonlinear Multi-Agent Systems Under Switching Topology*
Di Yu
- P125 *Finite-Time State Estimation of Markovian Jumping Neural Networks with Time-Varying and Distributed Delays*
He Huang
- P126 *On Prognosis of Wind Turbine Faults Based on Nonlinear Mixed Vibration Signals: A PSO Based EMD and KICA Combined Approach*
Qian Yang, Qiang Yang, Wenjun Yan, Miaoying Huang and Chunzhi Hu
- P127 *A Pruning Strategy Based on Confidence Interval for Sparse LS-SVM*
Jianquan Shi, Gangquan Si, Zhang Guo, Yanbin Zhang and Siyuan Ma
- P128 *Kalman Filtering for Networked Multi-Agent Systems with Random Packet Dropouts*
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- P129 *Study of Processing Method for High Precision Herringbone Gear Based on Symmetry Error Detection and Compensation*
Chunhua Zhao, Zhipeng Liang and Baojia Chen
- P130 *Kinematics and Dynamics Modelling of All Terrain Articulated Tracked Vehicles*
Hao Lin, Wei Lin, En Li and Zize Liang
- P131 *Fault Diagnosis Based on EEMD-IGSA-IPNN for Motor Bearing*
Qing Yang, Ye Li and Dongsheng Wu
- P132 *Disturbance Observer Based Dynamic Surface Tracking Control for a class of Uncertain Nonlinear Systems with Mismatched Disturbances*
Haibin Sun, Linlin Hou and Yankai Li
- P133 *Caption Detection and Removal from Video Images with Complicated Background Using Intelligent Inpainting Scheme*
Sixue Yang, Juntao Xue and Yunrui Zong
- P134 *BDS Receiver Baseband Signal Tracking Processing Algorithm*
Ershen Wang, Zhiming Hu, Tao Pang and Zhixian Zhang
- P135 *Estimation of Dissolved Oxygen via PLS and Neural Networks*
Wei Wang, Changhui Deng and Jinyan Song
- P136 *The Review of Demand Side Management and Load Forecasting in Smart Grid*
Haifan Zhao and Zhaohui Tang
- P137 *A Modified Synchronous Control Method For 2-DOF Arm-Typed Precision Centrifuge*
Xin Huo, Xingang Tong, Qiyue Wang and Zhaosheng Guo
- P138 *A Hybrid Energy Storage System Based on DSP for the Ship*
Jinyan Song, Wei Wang, Teng Gao, Kewei Cai and Yunli Zhao
- P139 *Spatial-Temporal Context-Aware Abnormal Event Detection Based on Incremental Sparse Combination Learning*
Hongkai Chen, Xiaoguang Zhao, Tianzheng Wang, Min Tan and Shiyong Sun
- P140 *Simulation Research Based on Evacuation Ability Estimation Method*
Han Wang, Ziyang Wang, Yuxin Hu and Likun Li
- P141 *Linear Permanent Magnet Motor Blend Brake System Simulation for Electromagnetic Launcher*
Lei Song, Jun Wu and Yu Bao

- P142 *Evaluation and Decision Support Based on Data Station*
Yun Wang, Zhimin Tian and Fei Xia
- P143 *Multi-Layer Structure Model and Configuration Mechanism of Ontogenetic Hardware*
Xiao Ma and Yue Li
- P144 *Energy-Based Swing Up Control of Rotary Parallel Inverted Pendulum*
Xingyan Zhao, Zhongcai Zhang and Jinming Huang
- P145 *Adaptive Cuckoo Search Algorithm for Continuous Function Optimization Problems*
Rui Chi, Yixin Su, Danhong Zhang and Xuexin Chi
- P146 *Phase-Compensator Design Using Convex-Programming Scheme*
Tianbo Deng
- P147 *Compact Modelling of Organic Rankine Cycle for Waste Heat Recovery*
Kailong Liu, Kang Li and Jianhua Zhang
- P148 *Optimization Control Method of VAV Air Conditioning System*
Xiaocheng Zhang, Ronghao Wang and Jianchun Xing

Monday, June 13, 3:50PM–5:50PM

Special Session: MonN2-1 Advanced Intelligent Control of Autonomous Systems, Chair: Bin Xu and Ning Wang, Room: Conference Room 2 (Li River Hall)87

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Lu Liu, Dan Wang and Zhouhua Peng
- 4:05PM *Reheated Steam Temperature Control Based on the r Incremental SGPC-PID*
Jinying Zhang, Qiusheng Zhang, Jianhong Lv and Longge Zhang
- 4:20PM *Global Finite-Time Trajectory Tracking Control of Autonomous Surface Vehicles*
Shuailin Lv, Ning Wang, Xiaoling Liang and Meng Joo Er
- 4:35PM *Adaptive Neuro-Fuzzy Tracking Control of UUV Using Sliding-Mode-Control-Theory-Based Online Learning Algorithm*
Yuxin Fu, Yancheng Liu, Yuanquan Wen, Siyuan Liu and Ning Wang
- 4:50PM *Real-Time Optimal Formation Reconfiguration of Multiple Wheeled Mobile Robots Based on Particle Swarm Optimization*
Mohamed A. Kamel, Xiang Yu and Youmin Zhang
- 5:05PM *Robust Output-Feedback Control for Vehicle Lateral Motion Regulation under Unreliable Communication Links*
Hui Jing, Rongrong Wang, Cong Li and Nan Chen
- 5:20PM *Command Filtered Adaptive Control for Integrated Missile Guidance and Autopilot with Terminal Angular Constraint*
Xiaoling Liang, Ning Wang, Yancheng Liu, Shuailin Lv and Bin Xu
- 5:35PM *Mathematical Model of the Control System of a Tethered Descent Underwater Vehicle*
Sergey An. Gayvoronskiy, Tatiana Ezangina and Ivan Khozhaev

Special Session: MonN2-2 New Development on Fuzzy Systems and Fuzzy Control, Chair: Baoyong Zhang and Shuping He, Room: Conference Room 3 (Seven Stars Hall)88

- 3:50PM *Robust Fault Detection for Nonlinear Discrete-Time Markovian Jump Systems with Partly Unknown Transition Probabilities*
Jiangbin Shi, Yanyan Yin and Fei Liu
- 4:05PM *Fuzzy Adaptive Control of Uncertain Complex Dynamical Networks with Nonlinear Couplings*
Xiaojian Li, Dawei Ding and Guanghong Yang
- 4:20PM *New Stability Criteria for Discrete-Time Fuzzy Systems with Time-Varying Delays*
Jun Chen and Baoyong Zhang
- 4:35PM *Input-Output Finite-Time Stability and Stabilization of Stochastic Fuzzy Systems with Randomly Occurring Uncertainties and Gain Fluctuations*
Jun Song, Yugang Niu and Yuanyuan Zou

- 4:50PM *LMI Solution for Local Nonquadratic H_∞ Filter Design of Continuous-Time T-S Fuzzy Systems*
Juntao Pan, Fang Liu, Bai Zhang and Guoqiang Wu
- 5:05PM *Failure Detection and Adaptive Fuzzy Backstepping Fault-Tolerant Control of Faults Nonlinear Systems*
Yongming Li and Shaocheng Tong
- 5:20PM *Observer-Based Adaptive Fuzzy Control for Nonstrict-Feedback Systems with Output Constraint*
Kai Sun, Lijie Wang, Chengwei Wu, Qi Zhou and Hongyi Li
- 5:35PM *Control Design of Nonlinear Networked Systems under Data Packet Dropouts*
Xiangpeng Xie, Songlin Hu and Jing Shi

Special Session: MonN2-3 Computational Intelligence Based Data-Driven Modeling, Optimization and Control, Chair: Dongbin Zhao and Haibo He, Room: Conference Room 4 (Elephant Trunk Hill Hall)89

- 3:50PM *Maximum Power Point Tracking Control of Solar Power Generation Systems Based on Type-2 Fuzzy Logic*
Shun Zhang, Tiechao Wang, Chengdong Li, Jianhong Zhang and Yan Wang
- 4:05PM *Sliding-Mode Formation Control for Cooperative Nonholonomic Robots with Uncertainties*
Lu Yu, Jianhong Zhang, Chengdong Li and Dianwei Qian
- 4:20PM *Design and Implementation of Tourism Activity Recognition and Discovery System*
Yifan Yuan, Junping Du, Dan Fan and JangMyung Lee
- 4:35PM *Determination of Optimal Process Parameters to Prepare Licorice Extract Micro-Particles Using Artificial Neural Network Based Particle Swarm Optimization*
Honghao Zhang, Guangdong Tian, MengChu Zhou and Chaoyong Zhang
- 4:50PM *Sampling-Interval-Dependent Stability for Sampled-Data Systems with Variable Sampling*
Hanyong Shao, Jianrong Zhao and Dan Zhang
- 5:05PM *Fault Monitoring and Diagnosis of Tobacco Ultrahigh-Speed Cellophane Sealing Machine with Multi-Condition Characteristic*
Wei Wang, Chunhui Zhao, Yuliang Li, Xiaochun Yu and Weidong Lou
- 5:20PM *Design and Maintenance of InSAR Configuration for Digital Elevation Measurement under J2 Perturbation*
Yanchao He and Ming Xu
- 5:35PM *SAR Imaging Algorithm for the Burden Surface in BF Based on wk Algorithm*
Huan Wang, Xianzhong Chen and Qingwen Hou

MonN2-4 Pattern Recognition, Image Processing, Machine Learning, Chair: Hefang Zhang and Xuezhi Xiang, Room: Conference Room 5 (Fold Brocade Hall)91

- 3:50PM *Estimating Fetal Brain Motion with Total-Variation-Based Magnetic Resonance Image Registration*
Luming Chen, Hefang Zhang, Shibin Wu, Shaode Yu and Yaoqin Xie
- 4:05PM *Motion Detection Based on RGB-D Data and Scene Flow Clustering*
Xuezhi Xiang, Wangwang Xu, Erwei Bai, Zike Yan and Lei Zhang
- 4:20PM *Vehicle Detection and Tracking for Gas Station Surveillance Based on AdaBoosting and Optical Flow*
Xuezhi Xiang, Wenlong Bao, Hanwei Tang, Jiajia Li and Yimeng Wei
- 4:35PM *A Hybrid Particle Swarm Optimization Algorithm for Coastline SAR Image Automatic Detection*
Jianchao Fan, Ke Cao, Jianhua Zhao, Dawei Jiang and Xiaoliang Tang
- 4:50PM *ID Localization and Recognition for Railway Oil Tank Wagon in the Industrial Scene*
Xuezhi Xiang, Fei Yang, Meng Wang, Wenlong Bao and Yujiao Sheng
- 5:05PM *A New Gait Recognition Method Using Kinect via Deterministic Learning*
Fenglin Liu, Ying Wang, Qinghui Wang, Long Zhang and Wei Zeng
- 5:20PM *A Time Synchronization Method for Inertial Sensor and Visual Sensor*
Ying Tian and Ming Fang
- 5:35PM *A Parallel Strategy for Stabilization Algorithm of Panoramic Camera Based on Multi-CCD*
Zhengwei Ren, Ming Fang, Shuzhe Si, Feiran Fu and Yue Gong

MonN2-5 Neural Networks and Control, Chair: Yancai Xu and Biao Luo, Room: Conference Room 6 (Yangshuo Hall)92

- 3:50PM *Adaptive Dynamic Programming for Residential Energy Scheduling with Solar Energy*
Yancai Xu, Derong Liu, Qinglai Wei and Biao Luo
- 4:05PM *Adaptive Velocity-Free Consensus of Networked Euler-Lagrange Systems with Delayed Communication*
Lijiao Wang, Bin Meng and Yong Hu
- 4:20PM *Self-Learning Optimal Guaranteed Cost Control of Input-Affine Continuous-Time Nonlinear Systems Under Uncertain Environment*
Ding Wang, Haibo He, Derong Liu, Chao Li and Huidong Wang
- 4:35PM *Improved Optimization Algorithm for Human Brain Structural Connectivity with Functional Connectivity Using Dynamic Mean-Field Model*
Xue Chen and Yanjiang Wang
- 4:50PM *The Impact of Data Normalization on Tropical Cyclone Track Forecast in South China Sea*
Lei Zhu and Jian Jin
- 5:05PM *State Estimation for Discrete Neural Networks with Randomly Occurring Uncertainties and Missing Measurements*
Nan Hou, Hongli Dong, Xianye Bu and Fan Yang
- 5:20PM *A New Class of Finite Time Nonlinear Consensus Protocol with Short Convergence Time for Networks of Dynamic Agent*
Xiaobo Wang, Juelong Li, Jianchun Xing, Ronghao Wang and Donghao Fu
- 5:35PM *Simulink Comparison of Varying-Parameter Convergent-Differential Neural-Network and Gradient Neural Network for Solving Online Linear Time-Varying Equations*
Zhijun Zhang, Siwei Li and Xiaoyan Zhang

MonN2-6 Smart Grids, Chair: Guang Shi and Shibin Wu, Room: Conference Room 7 (Lingui Hall).....94

- 3:50PM *Prediction of Energy Consumption in Office Buildings Based on Echo State Network*
Guang Shi, Derong Liu and Qinglai Wei
- 4:05PM *A Polynomial Fractional-Order Charge-Controlled Memristor Model*
Lijie Diao, Gangquan Si, Jianwei Zhu and Zhiqiang Ding
- 4:20PM *Steady-State Analysis of Electric Spring for Smart Grid*
Xile Wei, Yang Liu, Zhen Zhang and Jiang Wang
- 4:35PM *A Simple and Fast Image Cloning Algorithm*
Yehu Shen, Lei Wei, Qiming Xu and Zhenyun Peng
- 4:50PM *Signal Correlation Measure in Multi-Echo T_2^* -w MR Images*
Shaode Yu, Shibin Wu, Zhicheng Zhang and Yaoqin Xie
- 5:05PM *Data Interactive Interface Technology for Isomerized Electric Power Simulation Software Based on CIM*
Zhaoyong Meng, Boxi Zhou, Xiao Rong, Wenzhen Huang, Wei Hu and Yongliang Liu
- 5:20PM *Linear Prediction of One-Sided Autocorrelation Sequence for Noisy Acoustics Recognition of Excavation Equipments*
Sanwei Yang, Jiuwen Cao, Jianzhong Wang and Ruirong Wang
- 5:35PM *A Novel Self-Organizing Cerebellar Instrumental Learning Algorithm Based on CPN*
Jing Chen, Bing Li, Li Li and Zongshuai Li

MonN2-7 Biomedical Systems and Biosystems Automation, Chair: Jinling Liang and Zhong-Ping Jiang, Room: Pearl Hall95

- 3:50PM *LPVG Analysis of the EEG Activity in Alzheimer's Disease Patients*
Lihui Cai, Jiang Wang, Yuzhen Cao, Bin Deng and Chen Yang
- 4:05PM *Mortality Prediction for ICU Patients Using Just-in-Time Learning and Extreme Learning Machine*
Yangyang Ding, Xuejian Li and Youqing Wang
- 4:20PM *The Effect of Inhibitory Feedback on Temporal Regularity in Neural Networks*
Chen Jin, Jiang Wang, Bin Deng, Yingmei Qin and Chunxiao Han

- 4:35PM *A Nonlinear Auto-Regressive Volterra Model Based on FPGA*
Bin Deng, Hongji Li, Fei Su, Jiang Wang, Chen Liu and Yingmei Qin
- 4:50PM *Functional Connectivity Estimation with General Linear Model*
Jiang Wang, Hexi Zhou, Guosheng Yi and Dingtian Shi
- 5:05PM *Human Simulated Intelligent Control on Magneto-rheological Vibration Isolation System for Subway Floating Slab Track with Moving Load*
Rui Li, Hongli Zhou, Xi Li, Ze Zhang and Xiaojie Wang
- 5:20PM *A Bio-inspired Data Processing Method for Classification of Chinese Liquors Using Electronic Nose*
Yaqi Jing, Qinghao Meng, Peifeng Qi, Xuemei Jia and Shugen Ma
- 5:35PM *Prolonging the Network Lifetime Based on LPA-Star Algorithm and Fuzzy Logic in Wireless Sensor Network*
Ahmed Alkadhawee and Songfeng Lu

MonN2-8 Intelligent Transportation Systems, Chair: Gang Xiong and Q.M. Jonathan Wu, Room: Jadeite Hall.....97

- 3:50PM *A Comparison Study for Traffic Flow Data Compression*
Shuo Feng, Yi Zhang and Li Li
- 4:05PM *Cooperative Fusion for Road Obstacles Detection Using Laser Scanner and Camera*
Shashibushan Yenkanchi and Q.M. Jonathan Wu
- 4:20PM *Travel Time Prediction with Immune Genetic Algorithm and Support Vector Regression*
Pan Gao, Jianming Hu, Hao Zhou and Yi Zhang
- 4:35PM *Geometry Constraints-Based Visual Rail Track Extraction*
Zhongli Wang, Baigen Cai, Chunxiao Jia and Yinling Wang
- 4:50PM *A Kind of Adaptive Dynamic Transit Signal Priority Control Method*
Xisong Dong, Gang Xiong, Wenwen Kang and Fenghua Zhu
- 5:05PM *An Algorithm for Freeway Traffic State Detection Considering Speed Difference Characteristic*
Min Zhao, Xi Chen, Dihua Sun and Tong Zhou
- 5:20PM *Urban Traffic State Analysis Based on the Macroscopic Fundamental Diagrams of the Variability of Vehicle Densities*
Shuqing Liu and Jianmin Xu
- 5:35PM *Rolling Bearing Fault Diagnosis: A Data-Based Method Using EEMD, Information Entropy and One-Versus-One SVM*
Weili Qin, Wenjin Zhang and Chen Lu

MonN2-9 Big Data Analysis, Compressed Sampling and Visualization, Chair: Wenjia Wang and Yuelong Su, Room: Amber Hall98

- 3:50PM *Dynamic Ensemble Selection Methods for Heterogeneous Data Mining*
Chris Ballard and Wenjia Wang
- 4:05PM *Dynamic Information Extraction for the Big Data*
Xuebo Jin and Chao Dou
- 4:20PM *Fast Clustering Based on State Learning Machine*
Yu Kou, QingXiang Wu, Xue Li and Sanliang Hong
- 4:35PM *Data Preprocessing and Fitting Algorithm Based on Marine Data Sampled by Multiple Underwater Gliders*
Zhenzhen Xu, Mingfei Jia, Lu Li, Shuo Yu, Jiancheng Yu and Shijie Liu
- 4:50PM *HTME: A Data Streams Processing Strategy Based on Hoeffding Tree in MapReduce Environment*
Xin Song, Jing Gao, Jin'an Ma, Shaokai Niu and Huiyuan He
- 5:05PM *Design of Adaptive Feature Extraction Algorithm Based on Fuzzy Classifier in Hyperspectral Imagery Classification for Big Data Analysis*
Juan Rochac, Nian Zhang and Pradeep Behera
- 5:20PM *Revealing New York Taxi Drivers' Operation Patterns Focusing on the Revenue Aspect*
Yongqi Dong, Zuo Zhang, Rui Fu and Xie Na

- 5:35PM *Data Mining Applications for Finding Golden Batch Benchmarks and Optimizing Batch Process Control*
Yuelong Su and Fengqin Yu

MonN2-10 Intelligent Optimization and Applications, Chair: Huixian Huang and Anmin Zhu, Room: VIP Room.....99

- 3:50PM *A Self-Adaptive Mutation Cuckoo Search Algorithm*
Huixian Huang and Pengfei Hu
- 4:05PM *Neighborhood Search with Memory and Global Exchange for Three-Agent Job Shop Scheduling*
Deming Lei and Ziyi Ai
- 4:20PM *Self-Adaptive Differential Evolution Algorithm for the Optimization Design of Pressure Vessel*
Huixian Huang and Pengfei Hu
- 4:35PM *An Improved Cuckoo Search Algorithm for Resource-Constrained Project Scheduling Problem with Generalized Precedence Relations*
Yidong Jin, Hui Nie, Pengfei Duan and Huihua Yang
- 4:50PM *Mixing Control of Animating Virtual Human for Maintenance Simulation*
Zhiqi Guo, Chuan Lv, Dong Zhou, Xu Peng and Zili Wang
- 5:05PM *Planning Optimal Trajectory for Histogram-Enabled Mapping and Navigation by an Efficient PSO Algorithm*
Chaomin Luo, Anmin Zhu, Hongwei Mo and Wenbing Zhao
- 5:20PM *An Expert System Reasoning Machine Based on the Combination of Fault Tree and Generalized Regression Neural Network*
Lu Yang, Jian Wang, Guigang Zhang and Zhaoping Ding
- 5:35PM *A Modified Joint Trilateral Filter Based Depth Map Refinement Method*
Xuezhi Xiang, Zike Yan, Changjun Nan, Wangwang Xu and Zhang Lei

Tuesday, June 14, 1:30PM–3:30PM

Special Session: TueN1-1 Modeling, Identification and Control of Distributed Parameter Systems (DPS), Chair: Wei He and Deqing Huang, Room: Conference Room 2 (Li River Hall).....101

- 1:30PM *Vibration Suppression of an Axially Moving System by Adaptive Boundary Control*
Yu Liu, Kun Sun, Zhijia Zhao and Yilin Wu
- 1:45PM *Robust H_∞ Guaranteed Cost Control for Uncertain Linear Stochastic Partial Differential Systems with Time-Varying Delay*
Xisheng Dai, Sange Mei, Haiying Yuan and Yongxin Qin
- 2:00PM *Luenberger Observer Design for State Estimation of a Linear Parabolic Distributed Parameter System with Discrete Measurement Sensors*
Junwei Wang, Yaqiang Liu and Changyin Sun
- 2:15PM *Boundary Control Design for a Flexible Robotic Manipulaor Modeled as a Timoshenko Beam*
Xiuyu He, Wei He, Wei You and Changyin Sun
- 2:30PM *Boundary Control Based on an Infinite Dimensional System of a Marine Riser with Constraint*
Shuang Zhang and Xiuyu He
- 2:45PM *Identification of Unknown Modes for Air-Conditioning Based on Hybrid Clustering Algorithm*
Pengcheng Zhao, Donghui Li, Zhongyan Feng, Lele Yao and Guanlong Jia
- 3:00PM *Online Identification of Resonance Using Extremum Seeking Control*
Fanxing Kong, Songlin Chen, Siyuan Chen, Libin Wang and Xin Huo
- 3:15PM *Time and Frequency Domain Analysis to Plant Electrical Signal of Swallow palm and Anthurium under Controlled LED Environment*
Liguo Tian, Qinghao Meng, Yushuang Li, Meng Li, Xiaolin Wang and Yu Han

Special Session: TueN1-2 Quantum Control and Quantum Cybernetics, Chair: Daoyi Dong and Jing Zhang, Room: Conference Room 3 (Seven Stars Hall)102

- 1:30PM *Stochastic Distributed Consensus with Quantized Data and Input Noise*
Yu Lu, Xiaofeng Liao and Huiwei Wang
- 1:45PM *Feedback Tracking Control of a Class of Non-markovian Quantum Systems*
Shibei Xue and Ian R. Petersen
- 2:00PM *Novel Adaptive Dynamic Surface Control of Nonlinear systems*
Shuguang Liu, Yangwang Fang, Xianglun Zhang and Qiang Tang
- 2:15PM *Learning a Control Field for Simultaneous State Transformation in CO Molecules*
Chao Wang, Wei Zhang, Chuancun Shu and Daoyi Dong
- 2:30PM *Faithful Teleportation via Multi-Particle Quantum States in a Network with Many Agents*
Min Jiang, Xu Huang, Lipeng Xue and Yanhua Liu
- 2:45PM *Lyapunov-Based Control of a Double Quantum-Dot Qubit*
Shuang Cong and Mingyong Gao
- 3:00PM *Enhancing Optical Kerr Nonlinearity by Gain-Loss Balanced Feedback Loop*
Changlong Zhu, Chenshuo Sun, Zhongpeng Liu, Nan Yang and Jing Zhang
- 3:15PM *Maximum Likelihood Least Squares Iterative Identification Algorithm for Hammerstein Output Error Moving Average Systems*
Junhong Li, Weixing Zheng, Yi Yang, Qing Zhang and Chen Li

Special Session: TueN1-3 Application Oriented Image Analysis in Robot Vision and Machine Vision, Chair: Sheng-Lan Liu and Xu Yang, Room: Conference Room 4 (Elephant Trunk Hill Hall)103

- 1:30PM *Uncorrelated Feature Selection via Intra-Group Competition and Inter-Group Cooperation*
Mingyu Fan, Xiangmin Yuan, Wenlong Zhu, Guanhua Tian and Xilian Zhang
- 1:45PM *Local Co-Occurrence Pattern for Color and Texture Image Retrieval*
Li Li, Lin Feng, Shenglan Liu and Yang Liu
- 2:00PM *Robust High-Precision Control of a Piezoelectric-Actuated Nano-Positioner with Hysteresis Compensation*
Lina Xuan and Peng Yan
- 2:15PM *Kernelized Cross-Modal Hashing for Multimedia Retrieval*
Shoubiao Tan, Lingyu Hu, Anqi Wangxu, Jun Tang and Zhaohong Jia
- 2:30PM *The Intelligent Robot Arm Based on Sense of Sight*
Zhenyu Wu, Libin Liu, Yuchen An, Jiping Wu and Hongxu Shao
- 2:45PM *Transfer Classification for Distinct Manifestations with Shared Information*
Lu Qi, Peijie Yin, XiaYuan Huang, Ken Chen and Hong Qiao
- 3:00PM *Grasp Type Understanding-Classification, Localization and Clustering*
Yinlin Li, Yuren Zhang, Hong Qiao, Ken Chen and Xuanyang Xi
- 3:15PM *Edge Preservation Ratio for Image Sharpness Assessment*
Luming Chen, Fan Jiang, Hefang Zhang, Shibin Wu, Shaode Yu and Yaoqin Xie

TueN1-4 TJ Tarn Best Theoretical Paper Award, Chair: Guangren Duan, Room: Conference Room 5 (Fold Brocade Hall)105

- 1:30PM *Boundary Analysis in Block Schemes for Control of Some Multi-Level Quantum Systems*
Yang Ling, Dewen Cao, Yaoxiong Wang, Feng Shuang and Fang Gao
- 1:50PM *Modeling and Vibration Control of Flexible Wings with Output Constraint*
Wei He, Tong Lv, Yunan Chen, Xiuyu He and Changyin Sun
- 2:10PM *Integrated Translational and Rotational Control for Rendezvous and Docking on Ellipse Orbits*
Han Yan, Shuping Tan and Yongchun Xie
- 2:30PM *Minimum Entropy Tracking Control for Non-gaussian Systems Using Proportional-Integral Strategy*
Bo Tian, Yan Wang and Lei Guo
- 2:50PM *Time-Varying Group Formation Control for Multi-Agent Systems with Second-Order Dynamics and Directed Topologies*
Xiwang Dong, Qingdong Li, Qilun Zhao and Zhang Ren

- 3:10PM *Exponential Stability of Impulsive Differential Systems with Variable Delays*
Huamin Wang, Shukai Duan, Tingwen Huang and Lidan Wang

TueN1-5 TJ Tarn Best Application Paper Award, Chair: Min Tan, Room: Conference Room 6 (Yangshuo Hall)106

- 1:30PM *Dynamics Analysis of an Offshore Ship-Mounted Crane Subject to Sea Wave Disturbances*
Yuzhe Qian and Yongchun Fang
- 1:50PM *Nonlinear Model Predictive Controller Design for Air System Control of a Gasoline Engine*
You Li, Yunfeng Hu, Shuwen Wang and Hong Chen
- 2:10PM *A Diagnosis Scheme for Intermittent Faults in Active Suspension Systems of High Speed Trains*
Rongyi Yan, Xiao He and Donghua Zhou
- 2:30PM *Fault Detection Filter and Controller Design for Unmanned Surface Vehicles*
Yulong Wang, Qinglong Han, Tianbao Wang and Chen Peng
- 2:50PM *Introducing Projective Transformations into Lunar Image Correspondence for Positioning Large Distance Rover*
Chuankai Liu, Baofeng Wang, Xu Yang and Geshi Tang
- 3:10PM *Teleoperation Control of an Exoskeleton Robot Using Brain Machine Interface and Visual Compressive Sensing*
Zhijun Li, Wei He, Chenguang Yang, Shiyuan Qiu, Longbin Zhang and Chun-Yi Su

TueN1-6 TJ Tarn Best Student Paper Award, Chair: Lei Guo (Beihang), Room: Conference Room 7 (Lingui Hall)107

- 1:30PM *Optimization-Based Compliance Control Strategy of Redundant Robot for ORU Replacements*
Li Jiang, Xijian Huo, Yiwei Liu and Hong Liu
- 1:50PM *Robust Trajectory Tracking Control for a Quadrotor Unmanned Aerial Vehicle Using Disturbance Observer*
Yi Yang, Qingxian Wu and Mou Chen
- 2:10PM *3D Vision Based Fast Badminton Localization with Prediction and Error Elimination for Badminton Robot*
Ziyu Chen, Hong Qiao, Rui Li, Chao Ma, Xiaoqing Li and Konggeng Zeng
- 2:30PM *Distributed Robust Attack Detection and Reconstruction for a Class of Uncertain Nonlinear Interconnected CPSs*
Wei Ao, Yongduan Song and Changyun Wen
- 2:50PM *Optimal Torque Coordinating Control Strategy Applied in Downshifting Process of a Novel Seamless Automatic Transmission*
Jie Ye, Kegang Zhao and Man Xu
- 3:10PM *Partial Blurred Object Segmentation for Non-uniform Motion Degraded Images*
Shaobo Zhang, Sheng Liu, Yiyuan Jiang, Xiaoyan Wang and Zhenhua Wang

TueN1-7 Steve and Rosalind Hsia Best Biomedical Paper Award, Chair: Yangmin Li, Room: Pearl Hall....108

- 1:30PM *Bogdanov-Takens Bifurcation for a Predator-Prey System with Holling Type IV Function*
Jinling Wang and Jinling Liang
- 1:50PM *A Classification-Based Fault Detection Method for Continuous Glucose Monitoring (CGM)*
Guangjian Song, Chunhui Zhao and Youxian Sun
- 2:10PM *Model-Free Robust Optimal Feedback Mechanisms of Biological Motor Control*
Tao Bian and Zhongping Jiang
- 2:30PM *A Visual Attention Based Convolutional Neural Network for Image Classification*
Yaran Chen, Dongbin Zhao, Le Lv and Chengdong Li
- 2:50PM *A Programmable Electrical Stimulator for Suppressing Pathological Tremor*
Wei Xin, Yongsheng Gao, Shengxin Wang and Jie Zhao
- 3:10PM *Rapid Detection of Chinese Liquors Using a Portable E-nose Based on C-SVM*
Peifeng Qi, Qinghao Meng, Yaqi Jing, Ming Zeng and Shugen Ma

TueN1-8 SUPCON Best Paper Award on Industrial Automation, Chair: Yiguang Hong, Room: Jadeite Hall109

- 1:30PM *Robust Hashing Learning via Multi-View Subspace Learning*
Yang Liu, Shenglan Liu and Lin Feng
- 1:50PM *FPGA-Based Active Disturbance Rejection Control for Antenna Servo Systems*
Zhiqiang Zuo, Yao Li and Yijing Wang
- 2:10PM *Soft Measurement Method for Froth Layer Thickness Based on Multi Visual Features*
Degang Xu, Xiao Chen, Ailian Ma, Yongfang Xie, Chunhua Yang and Weihua Gui
- 2:30PM *Optimal Balancing Control of Bipedal Robots Using Reinforcement Learning*
Fang Peng, Lijia Ding, Zhijun Li, Chenguang Yang and Chunyi Su
- 2:50PM *Time-Optimal Path Tracking for Coordinated Dual-Robot System Using Sequential Convex Programming*
Pengfei Cao, Yahui Gan, Jinjun Duan and Xianzhong Dai
- 3:10PM *Optimization Algorithm of Serial Manipulator Structure Based on Posture Manipulability*
Shiyuan Jia, Yinghong Jia and Shijie Xu

TueN1-9 Mobile Robots, Chair: Juntao Xue and Fei Chao, Room: Amber Hall110

- 1:30PM *A Novel Approach to a Mobile Robot via Multiple Human Body Postures*
Dajun Zhou, Fei Chao, Zuyuan Zhu, Chih-Min Lin and Changle Zhou
- 1:45PM *A Robot Pose Estimation Approach Based on Key Feature Registration*
Wenbo Yuan, Tianzhu Wang, Zhiqiang Cao and Min Tan
- 2:00PM *Fusing Sound and Dead Reckoning for Multi-Robot Cooperative Localization*
Yuhan Cheng, Qinghao Meng, Yingjie Liu, Ming Zeng, Le Xue and Shugen Ma
- 2:15PM *Mobile Robot Autonomous Path Planning Based on Fuzzy Logic and Filter Smoothing in Dynamic Environment*
Yupei Yan and Yangmin Li
- 2:30PM *Route Planning System of Smart Vehicles Based on Monocular Vision*
Yang Zhao, Juntao Xue and Shaopeng Xu
- 2:45PM *Tracking Feedback System of Golf Robotic Caddie Based on the Binocular Vision*
Yuejuan Tang, Jing Xu and Ming Fang
- 3:00PM *Multi-Robot Odor Source Search Based on Cuckoo Search Algorithm in Ventilated Indoor Environment*
Wenjie Wang, Mengli Cao, Shugen Ma, Chao Ren, Xinshan Zhu and Hongbo Lu
- 3:15PM *Trajectory Control of Lower Limb Exoskeleton Robot with Variable Forgetting Factor*
Fei Wang, Pengfei Shi, Shining Li, Shusen Zhao and Wanxia Liu

TueN1-10 Service Robots and Intelligent Society, Chair: Pengfei Cao and Shuhua Liu, Room: VIP Room..112

- 1:30PM *Cognitive Abilities of Indoor Cleaning Robots*
Shuhua Liu, Li Zheng, Siyu Wang, Runmin Li and Yu Zhao
- 1:45PM *Real-Time and Fast RGB-D Based People Detection and Tracking for Service Robots*
Yue Sun, Lei Sun and Jingtai Liu
- 2:00PM *An Emotion-Driven Attention Model for Service Robot*
Ying Mei and Zhentao Liu
- 2:15PM *Jacobian Analysis for Lower Mobility Parallel Robots Based on Actuating Wrenches*
Wanghui Bu, Jing Chen, Xianghua An and Chengju Liu
- 2:30PM *The Pitch-Reciprocal Screw Relating a Twist and an Actuating Wrench*
Wanghui Bu, Jing Chen, Xianghua An and Chengju Liu
- 2:45PM *Simultaneous Calibration and Mapping for Mobile Robot with Non-holonomic Constraint*
Hengbo Tang, Yunhui Liu and Luyang Li
- 3:00PM *Triple-Step Nonlinear Control Design for Road Vehicles After a Tire Blow-Out on the Highway*
Fei Wang, Ningfeng Hao, Linhuan Song and Hong Chen
- 3:15PM *A Slope Detection Method Based on 3D LiDAR Suitable for Quadruped Robots*
Xiangrui Meng, Zhiqiang Cao, Leijie Zhang, Shuo Wang and Chao Zhou

Tuesday, June 14, 1:30PM–5:50PM**Plenary Poster Session: P2 Poster Session 2, Chair: Jun Chen and Haibin Sun, Room: Poster Area.....113**

- P301 *Ear Recognition with Occlusion via Discrimination Dictionary and Occlusion Dictionary Based Sparse Representation*
Li Yuan, Fen Li and Wei Liu
- P302 *Passivity Control Based on Euler-Lagrangian Model for D-STATCOM with LCL Filter*
Jinmu Lai, Xianggen Yin, Ertao Lei, Yu Chen and Xin Yin
- P303 *A Comprehensive Control Strategy Suitable for Reactive Power Compensation and Harmonic Elimination*
Jian Dai, Minghao Wen, Ertao Lei, Yu Chen, Haihuan Wu and Xianggen Yin
- P304 *An Improved Probabilistic Principal Component Analysis Approach for Process Monitoring and Fault Diagnosis*
Zhengdao Zhang, Bican Peng and Linbo Xie
- P305 *A Simulation Study on Air Traffic Control Strategies*
Xiaobing Hu, Jianqin Liao and Ezequiel Di Paolo
- P306 *Experimental Method of Three-Dimensional Velocity Field Measurement in Circular Pipe Based on PIV*
Dandan Zheng, Guang Lu, Jiaodan Zhang and Mi Wang
- P307 *An Improved Load Shedding Model Based on Power Flow Tracing*
Guoyan Chen, Yong Wang, Guojun Lu, Jin Hu, Dahai You, Feng Zhang and Zhe He
- P308 *An Economic Dispatch Model Based on Scenario Tree in Industrial Micro-Grid with Solar Power and Storage*
Jing Cai, Feng Gao, Xiaohong Guan, Kun Liu, Nana Yao and Xingrui Cheng
- P309 *Charging and Discharging Control for Flywheel Battery Driven by Switched Reluctance Machine*
Hongwei Fang, Dan Wang, Huimin Chu and Ting Jia
- P310 *Stereoscopic Image Generation Based on Region-Wise Rendering for 2D to 3D Conversion*
Wei Liu, Dehua Zhang, Mingyue Cui and Yu Zhang
- P311 *A New Kind of Learning Algorithm with the Mechanism of Intrinsic Motivation*
Xiaoping Zhang, Xiaogang Ruan, Yao Xiao and Jing Huang
- P312 *Distributed Optimization Strategy for Multi-Region Power Scheduling Based on Alternating Direction Method of Multipliers*
Chenlin Sun, Jiang Wu, Feng Gao and Xiaohong Guan
- P313 *Adaptive Output Feedback Dynamic Surface Control of Nonlinear Systems with Actuator Failures and Unmodeled Dynamics*
Jun Mao, Tianping Zhang and Qikun Shen
- P314 *Reactive Power Compensation in Microgrids via Distributed Control Strategy*
Xiong Hu, Hong Zhou, Zhi-Wei Liu, Zhi-Hong Guan and Ming Chi
- P315 *Combustion Timing Control of HCCI Engine Based on FNN-PID and Black-Box Model*
Taixiong Zheng, Song Pan, Yongfu Li, Bin Yang, Lichen Shi and Zuyao Li
- P316 *Output Feedback Tracking Control of a Class of Continuous Nonlinear Systems via Adaptive Dynamic Programming Approach*
Yang Yang, Dong Yue and Jing Shi
- P317 *Analysis of Coupling Effects between Flight and Propulsion Systems for DPC Aircraft*
Jing Zhang, Xianfa Zeng and Lingyu Yang
- P318 *Rolling Element Bearing Diagnostic Based on EEMD and SVM*
Nan Xie, Fei Ma and Beirong Zheng
- P319 *Imperialist Competitive Algorithm for Design Optimization of Crane Metallic Structure*
Xiaoning Fan and Zhiyong Cui
- P320 *Modeling of Spacecraft with Flexible Solar Panel Considering Thermally Induced Motion*
Lijun Li and Liang Tang
- P321 *A Novel Spatial Approach for Classification of High-Resolution Image Scene*
Yuxia Sheng and Xiaoyong Bian

- P322 *Event-Based Consensus of First-Order Discrete Time Multi-Agent Systems*
Wei Zhu and Zhongyuan Tian
- P323 *Location Recommendation Algorithm Based on Temporal and Geographical Similarity in Location-Based Social Networks*
Zhengwu Yuan and Haiguang Li
- P324 *Design of Fractional Order Smith Predictor Controller for Non-square System*
Shuai Lei, Zhicheng Zhao and Jinggang Zhang
- P325 *An Improved ORB, Gravity-ORB for Target Detection on Mobile Devices*
Zhuqing Hu and Yongshi Jiang
- P326 *Multi-Model Switching Control of Hypersonic Vehicle with Variable-Geometry Scramjet Inlet Based on Adaptive Neural Network*
Jingqi Gao, Liqian Dou and Peihua Su
- P327 *Selective Ensemble Kernel Partial Least Squares Method Based on Dual Layer Genetic Algorithm Optimization with Its Application*
Jian Tang, Tianyou Chai, Zhiwei Wu, Zhuo Liu and Wen Yu
- P328 *Design and 2D Finite Element Analysis for a Novel Magnetic Gear Integrated Brushless Permanent Machine*
Lifei Zhang and Qingqing Ding
- P329 *Integrated Fault Detection and Control for 2-D Roesser Systems*
Ren Yingying, Da-Wei Ding and Li Mo
- P330 *A Neural-Network-Based Model of Hysteresis in Magnetostrictive Actuators*
Yu Shen, Lianwei Ma, Jinrong Li, Xinlong Zhao, Xiuyu Zhang and Hui Zheng
- P331 *Application of Weighted Evidence Theory in the Space-Earth Fault Diagnosis Result Fusion of Spacecraft*
Wenjing Liu and Baoyi Teng
- P332 *Design of H_{∞} Optimal PID Controller Based on Multi-Agent Particle Swarm Optimization Algorithm*
Binquan Wang, Lingcheng Kong and Guoqi Ma
- P333 *Controllability of Discrete-Time Switched Fractional Order Systems*
Artur Babiarz, Tomasz Grzejszczak, Adrian Legowski and Michal Niezabitowski
- P334 *Using Smartphones to Estimate Vehicle Emission under Urban Traffic Level-of-Service*
Liguo Zhang, Mengning Ou, Xu Fu and Xupu Yan
- P335 *Variable Structure Single Neuron Adaptive PSD Control of Automotive Electronic Throttle*
Taixiong Zheng, Hao Xu, Yongfu Li, Yang Bin, Lichen Shi and Weimin Han
- P336 *A Robust Alogrithm for Deadline-Constrained Task Scheduling in Small Satellite Clusters*
Jin Wu, Lixiang Liu and Xiaohui Hu
- P337 *A Modified Hopfield Neural Network for Solving TSP Problem*
Rong Li, Junfei Qiao and Wenjing Li
- P338 *Local Entropy Principal Component Analysis and Its Application for Multimode Process Monitoring*
Na Zhong and Xiaogang Deng
- P339 *Fault Diagnosis for Centrifugal Pumps Based on Complementary Ensemble Empirical Mode Decomposition, Sample Entropy and Random Forest*
Yang Wang, Chen Lu, Hongmei Liu and Yajie Wang
- P340 *PEM Fuel Cell Health State Assessment Using a Geometrical Approach and Mahalanobis Distance*
Yajie Wang, Hongmei Liu, Chen Lu and Bo Zhou
- P341 *The Influence of Fundamental Frequency on Speaker Recognition System*
Yi Zhang, Yanyi Xie and Kejia Wang
- P342 *Epileptic Seizure Detection of Electroencephalogram Based on Weighted-Permutation Entropy*
Zhenxi Song, Jiang Wang, Lihui Cai, Bin Deng and Yingmei Qin
- P343 *Planning and Heuristics of Assistant Manipulator*
Artur Babiarz, Tomasz Grzejszczak, Adrian Legowski, Michal Niezabitowski and Justyna Orwat
- P344 *Fault Estimation and Robust Tolerant Control for a Class of Nonlinear Takagi-Sugeno Fuzzy Systems*
Guannan He, Yang Liu, Jing Zhang and Wensheng Yu

Tuesday, June 14, 3:50PM–5:50PM

Special Session: TueN2-1 Modeling, Control and Optimization of Electrical Traction System in High-Speed Railway, Chair: Wenbo Du and Zheng Zheng, Room: Conference Room 2 (Li River Hall).....120

- 3:50PM *Decoupling Predictive Current Control for Traction Line-Side Converter in High-Speed Railway*
Chuan Xiang, Zhigang Liu, Shulong Yao and Guinan Zhang
- 4:05PM *H_∞ Control of Line-Side Converter in Electric Multiple Unit*
Shulong Yao, Zhigang Liu, Xiang Chuan and Guinan Zhang
- 4:20PM *Cascaded H-bridge Harmonic Generator Used for Impedance-Frequency Assessment of Traction Power Supply System*
Qiujiang Liu, Mingli Wu, Kejian Song and Jing Li
- 4:35PM *Measurement and Simulation on Low-Frequency Oscillation in the Traction Network of Xuzhou North Railway Hub*
Jing Li, Mingli Wu and Qiujiang Liu
- 4:50PM *Energy-Saving Operation Optimization of Middle-Low-Speed Maglev Train Based on Genetic Algorithm*
Yan Jun Jiao, Shikai Liu, Haokai Huang, Xiao Ma and Shaoke Liu
- 5:05PM *Discharge Model and Control Strategy for E-bicycle Mixed Intersections*
Yuliang Liu and Yisheng Lv
- 5:20PM *Real-Time Vehicle Counting Method Based on Image Sequences with Laser Line*
Yun Ye and Xingang Wang
- 5:35PM *Nonlinear Model Predictive Controller Design for Electric Vehicle Lateral Stability Based on Active Rear Steering*
Hongyan Guo, Ningfeng Hao and Hong Chen

Special Session: TueN2-2 Application Oriented Image Analysis in Robot Vision and Machine Vision, Chair: Shenglan Liu and Zhenyu Wu, Room: Conference Room 3 (Seven Stars Hall)121

- 3:50PM *A Graph Matching Based Key Point Correspondence Method for Lunar Surface Images*
Yuren Zhang, Xu Yang, Hong Qiao, Zhiyong Liu, Chuankai Liu and Baofeng Wang
- 4:05PM *A Modified Algorithm of Radar Simulator Echo Images Generation*
Ye Li and Hong-xiang Ren
- 4:20PM *Color Binary Correlation Descriptor for Image Retrieval*
Jun Wu, Shenglan Liu and Lin Feng
- 4:35PM *Optimal Label Vector for Convolutional Neural Network*
Lin Feng, Muxin Sun, Shenglan Liu and Jun Wu
- 4:50PM *Design of Vibrating Wire Sensor Signal Acquisition Board Based on STM32*
Zhenyu Wu, Shenglan Liu, Meng Du, Qiang Li, Chengda Han and Jiping Wu
- 5:05PM *Fast Rejecting Mismatches Using Pair-Wise Similarity*
Deheng Qian, Xu Yang, Yuren Zhang and Hong Qiao
- 5:20PM *Short-Term Demand Forecasting for Distributed Water Supply Networks: A Multi-Scale Approach*
Ziwei Ren and Shaoyuan Li
- 5:35PM *The Development and Prospect of Surface Defect Detection Based on Vision Measurement Method*
Lunxi Yuan, Zhengtao Zhang and Xian Tao

Special Session: TueN2-3 Control and Filtering for Distributed Networked Systems, Chair: Qinglong Han and Yulong Wang, Room: Conference Room 4 (Elephant Trunk Hill Hall)122

- 3:50PM *Matrix Quadratic Convex Combination for Stability of Linear Systems with Time-Varying Delay via New Augmented Lyapunov Functional*
Feisheng Yang, Jing He and Lei Li
- 4:05PM *Optimal Estimation for Networked Multi-Sensor Systems with Communication Constraints*
Jiajia Jin, Wen'an Zhang and Hongxia Wang
- 4:20PM *A Novel 3D Binary-State Angle Network and Its Reliability Evaluate*
Chialing Huang, Weichang Yeh, Hawsheng Wu, Chyh-Ming Lai and Yuxian Huang

- 4:35PM *Distributed L_2 - L_∞ State Estimation for Periodic Systems with Multiplicative Noises*
Renquan Lu, Junyi Li, Hui Peng and Yong Xu
- 4:50PM *An Approach of Designing and Developing Human View of C4ISR Architecture*
Li Ma, Aimin Luo and Jiong Fu
- 5:05PM *Finite-Time Consensus Problem of Multi-Agent Systems over Switching Jointly Connected Topologies*
Fenglan Sun, Rui Wang, Yongfu Li and Feng Liu
- 5:20PM *Distributed Consensus-Based Filter for Linear Systems with Random Transmission Delays and Packet Dropouts*
Chunyan Han and Wei Wang
- 5:35PM *The Design of Automatic Frequency and Load Modulation of Marine PMS Based on ControlLogix*
Yongran Zheng, Ming Bai, Zuanliang Chen and Hupeng Huang

TueN2-4 Control Systems, Chair: Lei Guo and Shuping Ma, Room: Conference Room 5 (Fold Brocade Hall)
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- 3:50PM *Terminal Sliding Mode Control with Active Disturbance Reject for Spacecraft Trajectory Tracking*
Keping Liu, Yingmei Cao, Taihua Wang and Yuanchun Li
- 4:05PM *Unknown Input Observer Design for One-Sided Lipschitz Nonlinear Continuous-Time Singular Markovian Jump Systems*
Jiaming Tian and Shuping Ma
- 4:20PM *Vibration Suppression of a Flexible Marine Riser by Output Feedback Boundary Control*
Kexing Huang, Zhijia Zhao, Yu Liu and Fang Guo
- 4:35PM *Real-Time Tuning of Cavity Filters by Learning from Human Experience: A Vector Field Approach*
Zhiyang Wang, Shaokun Jin, Jingfeng Yang, Xinyu Wu and Yongsheng Ou
- 4:50PM *Contouring Error Computation and Cross-Coupled Control for Biaxial Servo System*
Yongqi Shao, Yunjiang Lou and Ran Shi
- 5:05PM *Nonlinear Power and Rate Control for Wireless Networks*
Cunwu Han, Xueting Zhang, Lei Liu, Song Bi, Zhonghua Pang and Dehui Sun
- 5:20PM *The Synchronous Control of Multi-Motor Drive Control System with Floating Compensation*
Qiang Wang and Fang He
- 5:35PM *The Brittleness Problem of Power System with Different Wind Power Penetration Based on Cellular Automata Theory*
Jian Guo, Xu Zhang, Jia Du, Haishan Guo, Yi Jiang and Xuesong Yan

TueN2-5 System Modeling and Networked Control Systems, Chair: Xiaomei Zhang and Min Yang, Room: Conference Room 6 (Yangshuo Hall)125

- 3:50PM *Consensus-Based Asynchronous H_∞ Filtering over a Sensor Network with Switching Topology*
Xiaomei Zhang, Hong Zhu and Shaobo Zheng
- 4:05PM *Global Synchronization of Delayed Reaction-Diffusion Neural Networks via Impulsive Control*
Wuhua Chen, Shixian Luo and Weixing Zheng
- 4:20PM *Iterative Learning Control of a Minimal Half-Center Oscillator*
Shanshan Li, Guoshan Zhang and Jiang Wang
- 4:35PM *Model Identification and Controller Design on Piezoelectric Ceramics Actuator*
Yanmei Liu, Jun Shen, Zhen Chen and Yukun Wu
- 4:50PM *Comparative Study of Two 2-RPU+SPR Parallel Manipulators*
Qiang Yan, Bin Li, Yangmin Li and Xinhua Zhao
- 5:05PM *Fault Diagnosis for a Hydraulic Servo System Using Wavelet Packet and Neural Network*
Hongmei Liu, Da Li, Chen Lu and Dawei Liu
- 5:20PM *Coordinated and Stable Control of a Hybrid Energy Storage System for Wave Generation System*
Hongwei Fang, Song Lin, Huimin Chu, Ting Jia and Yitong Liu
- 5:35PM *Constrained Entropy-Based Temperature Control of Waste Heat Systems*
Jianhua Zhang, Mifeng Ren and Hong Yue

**TueN2-6 Computational Intelligence and Applications, Chair: Zhigang Zeng and Zhiqiang Cao,
Room: Conference Room 7 (Lingui Hall)126**

- 3:50PM *A Novel Approach for Short-Term Electric Load Forecasting*
Xiaoqin Wu, Zhixi Shen and Yongduan Song
- 4:05PM *Power Load Forecasting Based on Support Vector Machine and Particle Swarm Optimization*
Guanghua Ren, Shiping Wen, Zheng Yan, Rui Hu, Zhigang Zeng and Yuting Cao
- 4:20PM *Estimation of Single-Phase Grid Voltage Parameters: an Adaptive Observer-Based Approach*
Zhiyong Dai, Wei Lin, Hui Lin and Chunjiang Qian
- 4:35PM *Data-Driven Demand Forecasting Method for Fused Magnesium Furnaces*
Jie Yang and Tianyou Chai
- 4:50PM *Motion-Sensor Behavior Analysis for Continuous Authentication on Smartphones*
Chao Shen, Yunpeng Li, Tianwen Yu, Sheng Yuan, Xiao Yi and Xiaohong Guan
- 5:05PM *Event-Triggered Control Based on Adaptive Dynamic Programming for Continuous-Time Nonlinear Systems with Completely Unknown Dynamics*
Jing Shi, Dong Yue, Yang Yang and Songlin Hu
- 5:20PM *Real-Time Depth-Based Tracking Using a Binocular Camera*
Leijie Zhang, Zhiqiang Cao, Xiangrui Meng, Chao Zhou and Shuo Wang
- 5:35PM *Fault Diagnosis Technology of Rolling Bearing Based on LMD and BP Neural Network*
Lipin Zhang, Hongmei Liu and Chen Lu

**TueN2-7 Pattern Recognition, Image Processing, Machine Learning, Chair: Yunxuan Li and Xuemei Jia,
Room: Pearl Hall128**

- 3:50PM *Road Marking Detection Based on Structured Learning*
Liang Xiao, Chuanxiang Li, Dawei Zhao, Tongtong Chen and Bin Dai
- 4:05PM *Coordinated Control Strategy of Wind/Battery Energy Storage System Hybrid Power Output Based on Adaptive Dynamic Programming*
Xiangjun Li, Jingqiong Zhang, Yuting He and Dongbin Zhao
- 4:20PM *Accurate and Efficient Scene Recognition with Compact BoW and Ensemble ELM*
Jiuwen Cao, Xiaoping Lai, Tao Chen and Jiayuan Fan
- 4:35PM *Automated Blood Vessel Segmentation in Fundus Image Based on Integral Channel Features and Random Forests*
Zhun Fan, Yibiao Rong, Jiewei Lu, Jiajie Mo, Fang Li, Xinye Cai and Tiejun Yang
- 4:50PM *Combining PSO-KECA with ELM in an Electronic Nose for Classification of Chinese Liquors*
Xuemei Jia, Qinghao Meng, Yaqi Jing, Peifeng Qi, Ming Zeng and Shugen Ma
- 5:05PM *Salient Object Detection Based on Boundary Contrast with Regularized Manifold Ranking*
Yongkang Luo, Peng Wang, Wanyi Li, Xiaopeng Shang and Hong Qiao
- 5:20PM *An Online Learning Target Tracking Method Based on Extreme Learning Machine*
Liyang Xie, Yuanlong Yu and Zhiyong Huang
- 5:35PM *Saliency Detection via the Spatial Layout of Image*
Wen Wang, Tiejong Cao, Yunfei Zheng, Feibin Li and Xushan Chen

TueN2-8 Fuzzy Systems and Neural Networks, Chair: Lu Liu and Chenguang Yang, Room: Jadeite Hall ..129

- 3:50PM *Transient Tracking Performance Guaranteed Global NN Control of Robot Manipulator*
Chenguang Yang, Yiming Jiang, Zhijun Li, Wei He and Chunyi Su
- 4:05PM *H_∞ State Estimation for Neutral-Type Neural Networks with Continuously Distributed Delays*
Guoquan Liu, Chaomin Luo, Xianxi Luo and Wenbing Zhao
- 4:20PM *An Approach to Finite-Time Controller Design for a Class of T-S Fuzzy Systems*
Yue Li, Lu Liu and Gang Feng
- 4:35PM *Interval Type-2 Fuzzy-Model-Based Control Design for Systems Subject to Actuator Saturation under Imperfect Premise Matching*
Yuandi Li and Hak-Keung Lam
- 4:50PM *A Comparative Study of STA on large Scale Global Optimization*
Xiaojun Zhou, Chunhua Yang and Weihua Gui

- 5:05PM *Closed-Loop Teaching-Learning-Based Optimization Algorithm for Global Optimization*
Shuaiyin Zheng and Ziwu Ren
- 5:20PM *A Surrogate-Assisted Hybrid Optimization Algorithms for Computational Expensive Problems*
Qianqian Kong, Xiaojuan He and Chaoli Sun
- 5:35PM *User Characteristics Based Information Diffusion Model for Analysis of Hot Social Events*
Yanjuan Liu, Yongsheng Ding, Kuangrong Hao and Biao Huang

TueN2-9 Intelligent Automation Systems, Chair: Singsong Xu and Weichuan Liu, Room: Amber Hall130

- 3:50PM *Design and Analysis of a Compact Compliant Microgripper with Bidirectional Linear Actuation*
Sijie Yang and Qingsong Xu
- 4:05PM *Design and Analysis of a Micro-Gripper with Constant Force Mechanism*
Yilin Liu and Qingsong Xu
- 4:20PM *An Active Disturbance Rejection Controller with Hysteresis Compensation for Piezoelectric Actuators*
Weichuan Liu, Long Cheng, Zeng-Guang Hou and Min Tan
- 4:35PM *Hysteresis Model Identification of Piezoelectric Ceramic Actuators*
Zhen Chen and Yanmei Liu
- 4:50PM *Stability Analysis of the Car-Following Model Considering the Effects of Lateral Gap and Visual Angle*
Yongfu Li, Li Zhang and Bo Zhang
- 5:05PM *Scaled Group Consensus of Delayed Second-Order Multi-Agent Systems*
Xiangjun Li, Chenglin Liu and Fei Liu
- 5:20PM *Reversible Authentication Scheme Based on Prediction-Error Expansion with Compound Symbolic Chaos*
Guangyong Gao, Zongmin Cui, Caixue Zhou, Shimao Yao and Liya Xu
- 5:35PM *An Incentive-Based Supplier Selection Mechanism to Support Green Supply Chains*
Fang Yu, Lei Xue and Changyin Sun

TueN2-10 Intelligent Robots and Brain-Like Intelligence, Chair: Hong Qiao and Yifei Zhao, Room: VIP Room.....131

- 3:50PM *A Grid Method for Robot Path Recognition Based on RFID Technology*
Kaikai Zhao, Yimin Zhou, Zhibin Song and Yinzhou Shi
- 4:05PM *A Multi-FPGA Embedded System for the Emulation of Modular Small-World Network with Real Time Dynamics*
Shuangming Yang, Jiang Wang, Aiqing Zhao, Bin Deng and Haitao Yu
- 4:20PM *A Dynamical Compliant Grasping Strategy for Dexterous Robotic Hands with Cushioning Mechanism*
Xiaoqing Li, Hong Qiao, Chao Ma, Rui Li and Konggeng Zeng
- 4:35PM *Task-Specific Pre-Learning to Improve the Convergence of Reinforcement Learning Based on a Deep Neural Network*
Yuan Yang, Xiaoan Li and Lu Zhang
- 4:50PM *Causality Analysis during Shared Intentionality*
Huihui Zhuo, Sanqing Hu, Mark H Myers, Jianhai Zhang, Wanzeng Kong, Yu Cao and Robert Kozma
- 5:05PM *Paragraph Vector Based Retrieval Model for Similar Cases Recommendation*
Yifei Zhao, Jing Wang, Feiyue Wang, Xiaobo Shi and Yisheng Lv
- 5:20PM *Boosting-Based One-Class SVM for Recognizing True-Fake Chinese Liquors Using Electronic Noses*
Zhihua Li, Qinghao Meng, Peifeng Qi, Yu Zhou and Shugen Ma
- 5:35PM *Incremental Kalman Filter for Consensus Estimate of Wireless Sensor Networks*
Xiaolei Li, Xiaoyuan Luo and Shaobao Li

Wednesday, June 15, 1:30PM–3:30PM

Special Session: WedN1-1 Autonomous Control of Unmanned Aircraft Systems, Chair: Yifeng Niu and Xiangli Nie, Room: Conference Room 2 (Li River Hall).....133

- 1:30PM *Identification and Control of a Hovering Tiltrotor UAV*
Chao Chen, Lincheng Shen, Daibing Zhang and Jiyang Zhang

- 1:45PM *A New Manifold Distance Measure for Visual Object Categorization*
Fengfu Li, Xiayuan Huang, Hong Qiao and Bo Zhang
- 2:00PM *Quadcopter Autonomous Control System Based on Image Recognition*
He Luo, Yanqiu Niu, Zhengzheng Liang and Xiang Fang
- 2:15PM *LPV Eigenstructure Assignment Approach for BTT Missile Attitude Control*
Guangren Duan and Yanmei Hu
- 2:30PM *A Novel Location Method for an Inconspicuous Target Based on Affine Invariability Mapping*
Dawei Sun, Shicheng Wang, Dongfang Yang, Yongfei Li and Yubin Wu
- 2:45PM *An Improved Artificial Bee Colony- BP Neural Network Algorithm in the Short-Term Wind Speed Prediction*
Guanlong Jia, Donghui Li, Lele Yao and Pengcheng Zhao
- 3:00PM *Smooth State Feedback Stabilization for a Class of Planar Switched Nonlinear Systems under Arbitrary Switching*
Xiangze Lin, Shuaiting Huang, Chunjiang Qian and Shihua Li
- 3:15PM *Robust Attack Position of Multi-UCAV Based on Ant Colony Algorithm*
Xinqin Cao, Xueqiang Gu, Jing Chen and Xiaoqiang Sun

Special Session: WedN1-2 Computational Intelligence Based Data-Driven Modeling, Optimization and Control, Chair: Dongbin Zhao and Chengdong Li, Room: Conference Room 3 (Seven Stars Hall)134

- 1:30PM *Observer Based Policy Iteration Algorithm for Fault Tolerant Control of Nonlinear Systems with Actuator Faults*
Bo Zhao, Derong Liu, Yuanchun Li and Guang Shi
- 1:45PM *Fault Tolerant Control for Reconfigurable Manipulators Based on Adaptive Dynamic Programming with an Improved Performance Index Function*
Hongbing Xia, Bo Zhao, Fan Zhou, Bo Dong, Guangjun Liu and Yuanchun Li
- 2:00PM *Disturbance-Observer Based Fault Tolerance Control with On-Line Control Allocation*
Jun Wang, Wei Li, Chunbin Qin, Yi Zhou, Haishun Du and Hui Chen
- 2:15PM *Optimal Schedule Strategy of Battery Energy Storage Systems for Peak Load Shifting Based on Interior Point Method*
Yangtian Ning, Xiangjun Li, Xiufan Ma, Xuecui Jia and Dong Hui
- 2:30PM *Regularization and Feature Selection in Least Squares Temporal Difference with Gradient Correction*
Dazi Li, Luntong Li, Tianheng Song and Qibing Jin
- 2:45PM *Optimal Control Laws for Nonlinear Oscillator Systems with Saturating Actuators Using Neural Networks Based on Policy Iteration*
Shi Xing and Ruizhuo Song
- 3:00PM *Data and Knowledge Driven Design of SIRMs Connected Fuzzy Inference System with Application to Thermal Comfort Prediction*
Li Wang, Jianhong Zhang, Chengdong Li, Dianwei Qian and Guiqing Zhang
- 3:15PM *Using Big Data from the Web to Train Chinese Traffic Word Representation Model in Vector Space*
Wei Li, Xudong Xie, Jianming Hu, Zuo Zhang and Yi Zhang

Special Session: WedN1-3 Modeling, Control and Optimization in Air Transportation System....., Chair: Zhigang Liu and Mingli Wu, Room: Conference Room 4 (Elephant Trunk Hill Hall)136

- 1:30PM *Formation Reconfiguration Based on Distributed Cooperative Coevolutionary for Multi-UAVs*
Xueyuan Li, Xuejun Zhang, Huaxian Liu and Xiangmin Guan
- 1:45PM *A Hybrid DE-SQP Method for Vertical Trajectory Optimization of Continuous Descent Approach*
Lu Lu, Xuejun Zhang and Xiangmin Guan
- 2:00PM *Analysis of the Weighted Chinese Air Transportation Multilayer Network*
Chen Hong and Boyuan Liang
- 2:15PM *Direct Parametric Control-Oriented Model Transformations for a Hypersonic Vehicle*
Guangren Duan and Zhikai Zhang
- 2:30PM *A Method of SMS Spam Filtering Based on AdaBoost Algorithm*
Xipeng Zhang, Gang Xiong, Yuexiang Hu, Fenghua Zhu, Xisong Dong and Timo R. Nyberg

- 2:45PM *A Dynamic Peaking Model for Thermal Units Considering the Cost of Power Fluctuation Based on Statistical Results*
Long Zhang, Binqi Hu, Xianzhuang Liu and Wei Hu
- 3:00PM *Active Splitting Control Decision Scheme Design and Splitting Control Analysis in a Provincial Power Grid*
Yue Zhou, Qiangming Zhou, Hongqiao Yu, Qian Pu, Yifan Zhou, Wei Hu and Yujiao Chen
- 3:15PM *Robust Observer-Based Fault Estimation and Tolerant Control Scheme for a Class of Discrete Piecewise Systems*
Guannan He, Yang Liu, Jing Zhang and Wensheng Yu

WedN1-4 Linear Systems and Control, Chair: Jie Chen and Lin Tie, Room: Conference Room 5 (Fold Brocade Hall)137

- 1:30PM *On Delay-Range-Dependent Stability for Linear Systems with Time-Varying Delays*
Liansheng Zhang, Jie Chen and Qingcai Guo
- 1:45PM *Sigmoid Function Array Based ZG Control for Bounded Input, Energy Saving and Output Tracking of Time-Invariant Linear System*
Yunong Zhang, Jinjin Wang, Deyang Zhang, Binbin Qiu and Yinyan Zhang
- 2:00PM *Mode-Dependent Average Dwell Time Approach to Stabilization of Switched Linear Systems: the Event-Triggered Approach*
Yijing Wang, Shulan Li and Zhiqiang Zuo
- 2:15PM *Robust Engine Speed Controller Design Based on Quantitative Feedback Theory*
Liang Lu, Yunfeng Hu, Jinlong Hong, Xun Gong and Hong Chen
- 2:30PM *On Weak Ensemble Controllability with Applications to a Chain of Integrators*
Lin Tie and Jr-Shin Li
- 2:45PM *Adaptive Robust Attitude Control for Flexible Spacecraft with Control Moment Gyroscopes*
Lu Wang, Yu Guo, Wei Yao and Qingwei Chen
- 3:00PM *On Nested Predictor Feedback for Linear Systems with Both State and Input Delays*
Bin Zhou and Qingsong Liu
- 3:15PM *On Extension of a Gradient-Based Co-design Algorithm to Linear Descriptor Systems*
Yebin Wang, Yuh-Shyang Wang and Scott Bortoff

WedN1-5 Computational Intelligence and Applications, Chair: Fuxiao Tan and Yanfang Shou, Room: Conference Room 6 (Yangshuo Hall)138

- 1:30PM *The Processing of Big Traffic Data Based on Cloud Computing*
Dongbo Zhang, Yanfang Shou and Jianmin Xu
- 1:45PM *Soft Computing for Blast Furnace Gas System Pressure Based on an Improved Fuzzy Model*
Wenlin Zhang, Qiang Lin, Jun Zhao and Wei Wang
- 2:00PM *Combining WASP and ASF Algorithms to Forecast a Japan Earthquake with Mj 7.2 or Above*
Yunong Zhang, Sitong Ding, Jianfeng Wen, Yaqiong Ding and Mingzhi Mao
- 2:15PM *Online Sparse Kernel Learning-Based Adaptive Dynamic Programming*
Fuxiao Tan and Xinping Guan
- 2:30PM *Feedback-Control-Aided Image Stitching Using Multi-UAV Platform*
Chen Yu, Jianan Wang, Yan Ding, Jiayuan Shan and Ming Xin
- 2:45PM *A Novel Incremental Learning Scheme for Reinforcement Learning in Dynamic Environments*
Zhi Wang, Chunlin Chen, Hanxiong Li, Daoyi Dong and Tzyh-Jong Tarn
- 3:00PM *Bus Signal Priority Method Assessment Based on Multiple Attribute Group Decision*
Wenchao Shen, Jianmin Xu, Ming Wei and Zhengyu Tang
- 3:15PM *Uncertain Information Fusion for Gearbox Fault Diagnosis Based on BP Neural Network and DS Evidence Theory*
Jie Chen, Yibing Li and Fang Ye

WedN1-6 Optimization for Decision Making Systems, Chair: Zelin Nie and Jiang Wu, Room: Conference Room 7 (Lingui Hall).....140

- 1:30PM *Dynamic Locational Marginal Prices Based Zonal Division in Large-Scale Regional Electricity Markets*
Nana Yao, Jiang Wu, Kun Liu and Jing Cai
- 1:45PM *Contract for Difference (CfD) Energy Decomposition Model for Maximizing Social Benefit in Electricity Market*
Zelin Nie, Feng Gao, Jiang Wu, Xiaohong Guan and Kun Liu
- 2:00PM *Cost Effectiveness Model and Optimization of Weapon System Based on Cost as an Independent Variable*
Lei Gu, Xiangming Xi, Kuangyu Liu and Shuning Wang
- 2:15PM *An USV Controlling Autonomy Level Algorithm Based on PROMMETHEE*
Yingru Dong, Qijie Zou, Rubo Zhang, Ling Kang and Changning Ren
- 2:30PM *An Optimal Design of Dynamic Wireless Automatic Charging System for Roadway-Powered Electric Vehicles*
Bin Deng, Bingnan Jia, Zhen Zhang and Jiang Wang
- 2:45PM *A MBO Algorithm for a Flow Shop Problem with Sequence-Dependent Setup Times*
Aymen Sioud and Caroline Gagne
- 3:00PM *Multi-Event Maintenance Decision-Making Model and Optimization Method Based on Opportunistic Maintenance Policy*
Quanlei Wu, Chuan Lv, Dong Zhou, Yaoyao Wang and Dequan Yu
- 3:15PM *Signal Control Decision Model for Adjacent Intersection Based on Coordination Rate*
Yanfang Shou, Dongbo Zhang and Jianmin Xu

WedN1-7 Control Theory, Chair: Xiaofeng Liao and Huimin Qian, Room: Pearl Hall.....141

- 1:30PM *Examining Bounded Realness with Generalized Nyquist Loci in Multivariable Feedback Configurations*
Jun Zhou, Huimin Qian and Xinbiao Lu
- 1:45PM *Characteristic Modeling and All-Coefficient Adaptive Control of a Quadrotor*
Huang Huang
- 2:00PM *Modelling of the Vertical Raw Cement Mill Grinding Process Based on the Echo State Network*
Xiaofeng Lin and Mengqiao Zhang
- 2:15PM *Fast Model Predictive Control Based on Multiscale System Theory*
Qin Mei, Fang Xu, Hong Chen, Zongli Li and Yunfeng Hu
- 2:30PM *Event-Triggered Control for Stabilization of a Class of Nonlinear Systems Based on Extended State Observer*
Zhiqiang Zuo, Qiaoyu Luo, Dandan Li and Yijing Wang
- 2:45PM *The Impact of Hybrid Quarantine Strategies and Delay Factor on Viral Prevalence in Computer Networks*
Chang Li and Xiaofeng Liao
- 3:00PM *Fault Detection for Multi-Rate Sampling Systems Based on Dynamic Principal Component Analysis*
Zhijun Li, Lele Liang, Cunwu Han, Fumin Guo and Dehui Sun
- 3:15PM *An Improved Lattice Reduction Aided Detection Scheme in MIMO Systems*
Fang Ye, Chunxia Su and Yu Xia

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- 1:30PM *Parallel Control and Management System for Biomimetic Robotic Fish Based on ACP Approach*
Jincun Liu, Zhengxing Wu, Xiang Yang and Junzhi Yu
- 1:45PM *Decentralized Control for Reconfigurable Manipulator with Harmonic Drive Transmission Based on Adaptive Super-Twisting Algorithm*
Bo Dong, Keping Liu, Guangjun Liu and Yuanchun Li

- 2:00PM *H_∞ Fault Detection Observer Design for Networked Control Systems with Packet Dropout Using Delta Operator*
Xinyu Dong and Duanjin Zhang
- 2:15PM *Force Control Based Robotic Grinding System and Application*
Xiaohui Xie and Lining Sun
- 2:30PM *Combining Point and Edge for Satellite Pose Tracking Under Illumination Varying*
Yu Zou, Xueqian Wang, Tao Zhang and Jingyan Song
- 2:45PM *An Introduction of Vision-Based Autonomous Robotic Fish Competition*
Xingwen Zheng, Wei Wang, Chen Wang, Ruifeng Fan and Guangming Xie
- 3:00PM *Human-Computer Interaction in Immersive Virtual Maintenance*
Zhiqi Guo, Chuan Lv, Dong Zhou and Zili Wang
- 3:15PM *Path Finding for a NAO Humanoid Robot by Fusing Visual and Proximity Sensors*
Xiaoqian Mao, Huidong He and Wei Li

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Dehua Zhang, Wei Liu, Chunbin Qin and Hui Chen
- 1:45PM *Transit Time Based Sector Capacity Evaluation*
Junxiang Huang
- 2:00PM *A Data Frame Based Spatiotemporal Indexing Algorithm for Moving Objects*
Chengjiao Lv, Yongzhi Xu, Junping Song and Pin Lv
- 2:15PM *An ACE-Based Method for Evaluating the Impact of DC Interconnecting or AC Tie Line Fault*
Chunming Wang, Qunshan Li, Zhicheng Liu, Wei Xiong, Xianzhuang Liu and Wei Hu
- 2:30PM *The Analysis of Watermarking Capacity of Packing Model and Bits Replacement Model*
Hao Guo, Juntao Xue and Zhigang Jin
- 2:45PM *A Comparison of Background Subtraction Algorithms Evaluated with BMC Dataset*
Gongyan Wang, Jing Xu and Ming Fang
- 3:00PM *Fault Diagnosis of Internal Combustion Engine Valve Clearance the Survey of the-State-of-the-Art*
Taixiong Zheng, Rui Tan, Yongfu Li, Bin Yang, Lichen Shi and Tonglin Zhou
- 3:15PM *Performance Assessment for Aileron Actuators Based on MF-DFA and SOM Neural Network*
Hongmei Liu, Lianfeng Li, Chen Lu, Wanlin Zhao and Xuan Wang

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- 1:45PM *Decentralized Adaptive Pinning Control for Cluster Synchronization of Complex Networks in the Presence of Delay-Coupled and Noise*
Da Lin, Dong Yue, Songlin Hu and Hui Ge
- 2:00PM *Power Allocation for Cognitive Relay Systems*
Lina Fan, Jinkuan Wang and Jing Gao
- 2:15PM *Synchronization of Pinning Networks with Markovian Switching Topologies and Event-Triggered Communication*
Xinghua Liu, Gaoxi Xiao, Wee Peng Tay, Guoqi Ma and Hongsheng Xi
- 2:30PM *Noise Resistance Ability Analysis of the Visibility Graph and the Limited Penetrable Visibility Graph*
Ming Zeng, Wenxin Ma, Qinghao Meng, Biao Sun, Zhanxie Wu and Jing Lu
- 2:45PM *Multivariate Order Recurrence Network for Analyzing Cross-Correlation of the Wind Field and the Gas Concentration Field*
Ming Zeng, Jing Lu, Zaixin Yang, Qinghao Meng, Biao Sun and Jiaying Wang
- 3:00PM *Community Structure Detection in Complex Networks for Characterizing Atmospheric Boundary-Layer Wind Speed Time Series*
Ming Zeng, Mingyuan Zhao, Qinghao Meng and Jiaying Wang

- 3:15PM *Multivariate Directed Weighted Complex Network for Characterizing 3D Wind Speed Signals in Indoor and Outdoor Environments*
Ming Zeng, Mingyuan Zhao, Qinghao Meng and Biao Sun

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Xiaochun Yuan, Yongduan Song and Zijun Jia
- P502 *Model Predictive Torque Control of PMSM Systems Based on Sliding Mode Control*
Shuyuan Li, Qingfang Teng and Guofei Li
- P503 *Evaluation, Test and Research on Driver's Multi-Task Mental Load Characteristics for Road Traffic Safety*
Huiying Wen, Haiwei Wang, Min Liu and Wuning Lai
- P504 *Ray Trace Model of Solidification Shell Thickness Non-destructive Testing for Automatic Continuous Casting*
Qi Ouyang, Ximeng Chen, Song Peng, XingLan Zhang and ShuaiCheng Hou
- P505 *Advanced VSC and Intelligent Control Algorithms Applied to SVM_DTC for Induction Motor Drive: A Comparative Study*
Sadhana Jadhav and Kirankumar Jaladi
- P506 *Evaluation Model of Enterprise Business Model Reconstruction in Mobile Internet Era*
Xiao Xue, Donghua Liu and Shufang Wang
- P507 *Traffic Detectors Deployment Modeling and Optimization under Urban Road Network*
Hanjie Ye, Jianming Hu, Xudong Xie and Yi Zhang
- P508 *Simulation Design of Rolling Tube Machine Mandrel Support Device Hydraulic System*
Shuang Zhao and Wei Yuan
- P509 *Improved Delay-Range-Dependent Stability for Linear Systems with Time-Varying Delays Based on Affine Function*
Liansheng Zhang and Qiang Liu
- P510 *Agile Satellite Scheduling Based on Hybrid Coding Genetic Algorithm*
Xiyingzhi Geng, Jufang Li, Wenyuan Yang and Hongtao Gong
- P511 *An Improved Dehazing Method Based on the Transmission Compensation*
Haitao Liu, Jin Guo and Chang-Yin Sun
- P512 *Distributed MPC of the Standalone Hybrid Wind and Solar Generation System Based on Neural Network Modeling*
Mei Han, Xiaobing Kong and Xiangjie Liu
- P513 *Permutation Flow Shop Scheduling with Delay Time Under Time-of-Use Electricity Tariffs*
Xingrui Cheng, Feng Gao, Chaobo Yan, Xiaohong Guan, Kun Liu, Siyun Chen, Nana Yao and Jing Cai
- P514 *A Modified Hill Detouring Algorithm for Hinging Hyperplanes Minimization*
Kuangyu Liu, Zhiming Xu, Xiangming Xi and Shuning Wang
- P515 *Probabilities Modeling of Multi-Class Based on Relevance Vector Machine*
Rui Li, Xiaodan Wang, Lei Lei and Zhengchong Zhao
- P516 *An Accelerometer Modeling Approach Based on Mixed-Kernel Support Vector Machine*
Tao Yu, Baoya Hao, Jianlin Wang, Liqiang Zhao and Qingxuan Wei
- P517 *Analysis for a Class of Discrete-Time Switched Systems via Approximate Bisimulations*
Guoqi Ma and Xinghua Liu
- P518 *A Approach on UAV Ground Target Localization Based on Multi-sensor Fusion*
Yifeng Niu, Zhiwei Zhong, Daibing Zhang, Xun Wang and Jianhong Liang
- P519 *A Real-Time People Number Detection Algorithm of Scenic Spot Based on Density Center Clustering*
Yaomin Wen, Junping Du, Meiyu Liang, Dan Fan and JangMyung Lee
- P520 *High-Performance Three-Phase High-Power Three-Level Rectifier Using DSP-Based Digital Control Technique*
Zhi Zhang, Xueliang Liu, Ming Jiang and Yuan Yao

- P521 *Deep Neural Networks for Head Pose Classification*
Yang Lu, Shujuan Yi, Nan Hou, Jingfu Zhu and Tiemin Ma
- P522 *DCCA Cross-Correlation Analysis of 3D Wind Field Signals in Indoor and Outdoor Environments*
Ming Zeng, Xiaonei Zhang, Jinghai Li and Qinghao Meng
- P523 *Multiscale Entropy Analysis of the 3D Near-Surface Wind Field*
Ming Zeng, Shan Zhang, Erhong Wang and Qinghao Meng
- P524 *Effects of Sampling Frequency on Magnitude and Sign Correlations in Small-Scale Wind Speed Fluctuations*
Ming Zeng, Xiaonei Zhang, Jinghai Li and Qinghao Meng
- P525 *Multiscale Multifractal Analysis of Near-Surface Wind Speed Time Series*
Ming Zeng, Xiaonei Zhang, Jinghai Li and Qinghao Meng
- P526 *Comparison of Complexity Between Indoor and Outdoor Wind Speed Time Series*
Ming Zeng, Shan Zhang, Jing Lu, Qinghao Meng and Jiaying Wang
- P527 *A Method of Diagnosing Leakage of Boiler Steam and Water Pipe Based on Genetic Neural Network*
Yan Wang, Xianglei Yin and Boying Wang
- P528 *Path Planning of Unmanned Aerial Vehicles for Farmland Information Monitoring Based on WSN*
Jing Yang, Xiao Wang, Zetao Li, Ping Yang, Xuemei Luo, Kai Zhang, Shanshan Zhang and Lingfang Chen
- P529 *UGM-Based High-Accuracy Multi-Sensor Image Registration*
Ce Xiong, Hao Fu and Meiping Shi
- P530 *Design of High Frequency and High Power Supply for Ohmic Heating Based on ARM*
Shaogang Wang, Yin-Fa Yan, Fa-de Li and Zhanhua Song
- P531 *The Research and Comparison on the Combination Technology of Models Based on HLA Simulation*
Guohua Zhu and Yang Dai
- P532 *A Filter Feature Selection Method Based LLRFC and Redundancy Analysis for Tumor Classification Using Gene Expression Data*
Jiangeng Li, Xiaodan Li and Wei Zhang
- P533 *Fault Diagnosis Method Based on Probability Extended SDG and Fault Index*
Yingjie Liu, Qinghao Meng, Ming Zeng and Shugen Ma
- P534 *Parameter Identification of Linear Time-Invariant Systems with Large Measurement Noises*
Chyun-Chau Fuh, Hsun-Heng Tsai and Hung-Che Lin
- P535 *Fire Smoke Detection Based on Texture Features and Optical Flow Vector of Contour*
Yakun Wang, Aiguo Wu, Jie Zhang, Meng Zhao, Wenshuai Li and Na Dong
- P536 *Estimation for Globally Exponentially Attractive Set of a Hyperchaotic Lorenz-Type Systems and Its Application*
Xuezhen Liu
- P537 *Terminal Sliding Mode Cascade Control for Tracking and Synchronization of a Dual-Motor Driving System*
Minlin Wang, Xuemei Ren and Qiang Chen
- P538 *Parameter Estimation of Gaussian Mixture Model and Its Application in Multimode Process Monitoring*
Junfeng Gao, Lingke Zhou and Baozhu Du
- P539 *Automatic Detection and Counting of Circular Shaped Overlapped Objects Using Circular Hough Transform and Contour Detection*
Jianjun Ni, Zubair Khan, Shihao Wang, Kang Wang and Syed Kamran Haider
- P540 *Direct Torque Control for BLDCM Based on Optimized Sliding Mode Observer*
Wenshuai Li, Aiguo Wu, Na Dong and Yakun Wang
- P541 *Density Difference-Based Variable Speed Limit Control for Expressways under Rainfall Conditions*
Yuguang Chen, Jianming Lei, Wei Cheng, Linyong Su and Ying Liu
- P542 *Recursive Least Squares Algorithm for Parameter Identification of Multi-Input Output Systems Using the Data Filtering*
Jiling Ding

- P543 *Minimum Interfering Power Based on Interference Matrix Reconstruction for IA*
Xueying Diao, Yibing Li and Dandan Liu
- P544 *A Lattice Reduction Aided Parallel Detector Based on Quantization Error Correction*
Fang Ye, Han Yu and Yu Xia
- P545 *Battery State of Charge Estimation Hardware-in-Loop System Design Based on xPC Target*
Yan Ma, Bingsi Li, Xiuwen Zhou and Hong Chen
- P546 *The Adaptive Control Based on BP Neural Network Identification for Two-Wheeled Robot*
Hongguo Niu, Niu Wang and Nan Li
- P547 *Left-Coprime-Factorization-Based Measurement Fusion Wiener Estimators for Multi-Sensor Systems with Correlated Noises*
Yuan Gao, Jun Wang, Chenjian Ran, Yinlong Huo and Yinfeng Dou
- P548 *Active Control Strategies for Outdoor Near-Surface Wind Field Simulation in a Multiple-Fan Wind Tunnel*
Jiaying Wang, Qinghao Meng, Bing Luo, Ming Zeng and Shugen Ma

Wednesday, June 15, 3:50PM–5:50PM

Special Session: WedN2-1 Operator Based Robust Nonlinear Control and Its Application, Chair: Mingcong Deng and Shengjun Wen, Room: Conference Room 2 (Li River Hall).....154

- 3:50PM *Robust Dexterous Manipulation of a Soft Micro-Hand*
Zhengxiang Ma, Aihui Wang and Mingcong Deng
- 4:05PM *Operator-Based Control Scheme for Nonlinear Feedback System*
Ni Bu, Mingcong Deng, Ximei Liu and Chunpeng Han
- 4:20PM *Improved Artificial Bee Colony Algorithm Based Optimal Navigation Path for Mobile Robot*
Shengjun Wen, Juan Xia, Rongxiang Gao and Dongyun Wang
- 4:35PM *Operator-Based Robust Non-Linear Control for a Two-Link Robot Arm*
Hideki Yoshida, Shin Wakitani, Shuhui Bi and Mingcong Deng
- 4:50PM *Operator-Based Fault Tolerant Control for Uncertain Nonlinear Systems*
Shuhui Bi, Lei Wang, Ming Zhang and Mingcong Deng
- 5:05PM *Immune Optimization Based Multi-Objective Six-DOF Trajectory Planning for Industrial Robot Manipulators*
Tingting He, Yanan Zhang, Fengcai Sun and Xuhua Shi
- 5:20PM *Feedback Control Strategy in a Car-Following Model with Two Delays*
Cong Zhai, Weiming Liu, Ling Huang and Feigang Tan
- 5:35PM *Varying Gain MPC for Consensus Tracking with Application to Formation Control of Omnidirectional Mobile Robots*
Guanghao Zhang, Weiwei Qin, Qingqiang Qin, Bing He and Gang Liu

Special Session: WedN2-2 Real-Time Computing, Perception, Decision, and Interaction for Autonomous Robots and Robot Operating System, Chair: Shaowu Yang and Junhao Xiao, Room: Conference Room 3 (Seven Stars Hall)155

- 3:50PM *Multi-Agent Based Modeling and Simulation of Virtual Maintenance System*
Yaoyao Wang, Chuan Lv, Dong Zhou, Dequan Yu and Xu Peng
- 4:05PM *Unordered Images Selection for Dense 3D Reconstruction Based on Distance Dependent Chinese Restaurant Process*
Qinhu Ren, Qichao Wang, Jianhua Zhang and Shengyong Chen
- 4:20PM *A Mixed Parameter Scheduling Algorithm of Node Operating System in CPS*
Benhai Zhou, Miao Yu and Ting Liu
- 4:35PM *Multi-Sensor Devices for UAV in Both Simulation Platform and Realistic Tests*
Fuhua Wan, Qing Bu, Zhen Xie, Jianhua Zhang and Xi Yang
- 4:50PM *Improved Real-Time Odometry Estimation Method for Incremental RGB-D Mapping by Fusing IMU Data*
Ruibin Guo, Dongxiang Zhou, Keju Peng, Weihong Fan and Yunhui Liu

- 5:05PM *A Hybrid Cloud Robot Framework Based on Intelligent Space*
Huanzhao Chen, Guohui Tian, Fei Lu and Guoliang Liu
- 5:20PM *Metric Online Monocular SLAM by Using a Known Reference*
Yongfei Li, Shicheng Wang, Dongfang Yang and Dawei Sun
- 5:35PM *Charting the Landscape of Enterprise Architecture Complexity Cybernetics*
Jiong Fu, Aimin Luo, Xueshan Luo and Junxian Liu

**Special Session: WedN2-3 Quantum Control and Quantum Cybernetics, Chair: Daoyi Dong and Wei Cui,
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- 3:50PM *Quantum Process Tomography : A Joint Sparse Coding Method*
Xiaohu Yuan, Huaping Liu, Rebin Wu and Chunwen Li
- 4:05PM *Quantum Filtering for Multiple Measurements Driven by Two Single-Photon States*
Zhiyuan Dong, Guofeng Zhang and Nina Amini
- 4:20PM *How to Make Full Use of a Priori Knowledge of Quantum Information Processing*
Peng Kang and Ming Zhang
- 4:35PM *Luenberger-Sliding Mode Observer Based Ammonia Concentration Estimation for Selective Catalyst
Reduction System*
Taixiong Zheng, Weimin Han, Yongfu Li, Bin Yang and Lichen Shi
- 4:50PM *Filtering Based Multi-Innovation Stochastic Gradient Identification Algorithm for Multivariable
Nonlinear Equation-Error Autoregressive Systems*
Yawen Mao, Yanjun Liu and Feng Ding
- 5:05PM *Relationship between Driver's Feeling and Vehicle Operating Characteristics on Urban Road*
Xin Chang, Jian Rong, Chenjing Zhou and Haijian Li
- 5:20PM *Filtering and Fusion of Consensus-Based Multi-Agent Systems with Imperfect Constraints*
Yunze Cai, Hengyu Duan, Hua O. Wang and Weidong Zhang
- 5:35PM *On Model Identification and Precession Control of GyroWheel System*
Libin Wang, Hui Zhao, Xin Huo, Yuyu Zhao and Xiaoming Zhang

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Chair: Shenglan Liu and Xu Yang, Room: Conference Room 5 (Fold Brocade Hall)158**

- 3:50PM *Discriminative Extreme Learning Machine to Content-Based Image Retrieval with Relevance Feedback*
Xiaodong Huang, Liang Sun, Huihui Guo and Shenglan Liu
- 4:05PM *Universal Robust Algorithm for Detection of Image Features*
Konstantin Romyantsev and Dmitry Petrov
- 4:20PM *New Region-Based Image Fusion Scheme Using the Discrete Wavelet Frame Transform*
Lianhai Wang, Junping Du, Suguo Zhu, Dan Fan and JangMyung Lee
- 4:35PM *Intelligent Object Localization System Based on Activity Theory in Home Environment*
Yinghua Xue
- 4:50PM *Robust Speech Recognition Based on Speech Enhancement and Improved Perceptual Non-uniform
Spectral Compression*
Yi Zhang, Long Sun, Pei-pei Wang and Yuan Luo
- 5:05PM *Joint Geometry and Gray-Level Histogram Model for Lip-Reading*
Xinjun Ma and Hongjun Zhang
- 5:20PM *Aesthetic Quality Assessment of Photographic Images*
Chunjin Song, Bingyin Zhou and Wei Guo
- 5:35PM *Regression Forest for Interference Assessment in Real Ultra Short-Wave Communication Jamming
System*
Lei Zhang, Tinghan Xiao, Jia Hao and Xuezhi Xiang

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- 3:50PM *Design and Implementation of Auditory System for Mobile Robot Based on Kinect Sensor*
Shuopeng Wang, Peng Yang and Hao Sun

- 4:05PM *An Improved Word Segmentation Algorithm for Lip-Reading*
Xinjun Ma, Xiaohui Jiao and Hongjun Zhang
- 4:20PM *Encoding Words for Intelligent Evaluation of Injection-Production Wells Pattern Based on Enhanced Interval Approach*
Di Yu, Furui Liu, Weijian Ren and Yumin Liu
- 4:35PM *A Framework of Stability Analysis for Multi-Agent Systems on Arbitrary Topology Graph: A Class of Nonlinear Protocol*
Yong Wang and Xiaodong Lou
- 4:50PM *A Discrete Particle Swarm Optimization Algorithm Applied in Constrained Static Weapon-Target Assignment Problem*
Yili Zhou, Xiaobo Li, Yifan Zhu and Weiping Wang
- 5:05PM *Design of a Diamond Adsorption Detection System Based on Machine Learning Techniques*
Fan Zhun, Youxiang Zuo, Fang Li and Shuangxi Wang
- 5:20PM *A Kent Chaos Artificial Bee Colony Algorithm Based Wavelet Thresholding Method for Signal Denoising*
Xun Zhang, Juelong Li, Jianchun Xing, Ping Wang and Donghao Fu
- 5:35PM *A Intelligent Bone Lengthening Device Based on Genetic Algorithm*
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Xiaoyan Mao and Xiangyu Huang
- 4:05PM *FSMJ: Feature Selection with Maximum Jensen-Shannon Divergence for Text Categorization*
Bo Tang and Haibo He
- 4:20PM *GOBoost: G-mean Optimized Boosting Framework for Class Imbalance Learning*
Yang Lu, Yiu-ming Cheung and Yuan Yan Tang
- 4:35PM *The Comparison of Different Visual Features on RGB-D Mapping*
Yixing Li, Jian Wang, Chaoliang Zhong, Yucai Kong and Shirong Liu
- 4:50PM *A Novel AFM Imaging Method Based on Liquid Force-Distance Curve Analysis*
Xiaozhe Yuan, Yongchun Fang and Xiao Ren
- 5:05PM *Image Recognition and Classification Based on REM with LBP Feature*
Ying Jiang and Yanjiang Wang
- 5:20PM *Toward Improved P300 Speller Performance in Outdoor Environment Using Polarizer*
Shenghong He, Qiyun Huang and Yuanqing Li
- 5:35PM *Estimation of Optical Flow from Sequential Image Method Applied for Object Tracking*
Franco Rino Fidiniaina, Xuezhi Xiang and Hilari Javier

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- 3:50PM *Robust Measurement Fusion Kalman Filter for Multisensor Systems with Multiplicative Noises and Uncertain Noise Variances*
Wenqiang Liu, Xuemei Wang and Zili Deng
- 4:05PM *Robust Guaranteed Cost Steady-State Kalman Estimators with Uncertain Noise Variances*
Chunshan Yang, Zhibo Yang and Zili Deng
- 4:20PM *Modified Robust Covariance Intersection Fusion Steady-State Kalman Estimators with Uncertain Noise Variances*
Xuemei Wang, Wenqiang Liu and Zili Deng
- 4:35PM *Guaranteed Cost Robust Modified Covariance Intersection Fusion Kalman Filter for Multi-Sensor System with Uncertain*
Zhibo Yang, Chunshan Yang and Zili Deng
- 4:50PM *Blind Separation of Spatially Correlated Signals Mixed by MIMO FIR Systems*
Yong Xiang, Dezhong Peng and Liu Yang

- 5:05PM *Multifractal Analysis of Short-Term Wind Speed Time Series with Different Sampling Frequencies*
Ming Zeng, Xiaonei Zhang, Jinghai Li and Qinghao Meng
- 5:20PM *NHEED: An Energy-Efficient Multi-Hop Routing Protocol Based On HEED*
Huaiyu Wang, Qingwei Liu and Mandan Liu
- 5:35PM *Human Daily Activity Recognition Based on Online Sequential Extreme Learning Machine*
Yanan Song, Zhigang Liu and Jinkuan Wang

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- 3:50PM *A 6-DOF Articulated Robot Stiffness Research*
Shouyan Chen, Tie Zhang and Ming Shao
- 4:05PM *Predictive Control Based Target Tracking Control for a Carangiform Robotic Fish*
Siyuan Chen, Songlin Chen, Chang Liu, Baoqing Yang and Feitian Zhang
- 4:20PM *Compliance Control on 6-DOF Robot Modular Manipulator with Fuzzy Methodology*
Hongxing Wei, Tianqi Gu, Bo Yang and Zhenzhou Shao
- 4:35PM *Three Dimensional D*Lite Path Planning for Autonomous Underwater Vehicle under Partly Unknown Environment*
Bing Sun and Daqi Zhu
- 4:50PM *Positional Accuracy Analysis of Welding Robot under Mechanism Clearance and Elastic Deformation*
Yijian Mao, Fengshui Jing, Zize Liang and Zaojun Fang
- 5:05PM *Trajectory Tracking of 3-DOF Spatial Robot Manipulator*
Kaige Wan, Aiguo Wu, Haiting Liu and Na Dong
- 5:20PM *Optimization of Tracking Control and ESO Vibration Suppression for Free-Floating Flexible Space Robot with Bounded Torque*
Zhenan Pang, Guoliang Zhang, Fan Yang, Zhilin Lin and Xiao Jia
- 5:35PM *Random Particles Boosted RRT for Complicated 3D Environments with Narrow Passages*
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- 3:50PM *Bio-Inspired Model for Object Recognition Based on Histogram of Oriented Gradients*
Limiao Deng and Yanjiang Wang
- 4:05PM *Design of Virtual Resource Management Agent Based on Fuzzy Analytic Hierarchy Process*
Fei Lu, Guohui Tian, Guoliang Liu, Yuheng Wang and Huan Zhao Chen
- 4:20PM *Real-Time Attitude and Gyro-Bias Estimation for Small UAVs Using Low-Cost Sensors*
Xiaobo Lin, Yao Yu and Chang-Yin Sun
- 4:35PM *A Numerical Model to Simulate the Aerodynamic Olfactory Effect of the Gas-Sensitive UAV*
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- 4:50PM *Vision-Based Behavior for UAV Reactive Avoidance by Using a Reinforcement Learning Method*
Zhaowei Ma, Yifeng Niu and Lincheng Shen
- 5:05PM *Speech Endpoint Detection Algorithm with Low Signal-to-Noise Based on Improved Conventional Spectral Entropy*
Yi Zhang, Kejia Wang and Bo Yan
- 5:20PM *Design of Hopping Mechanism for a Kangaroo-Bionic Robot*
Guoyu Zuo, Yuwei Liu and Xinpeng Wang
- 5:35PM *A Study on the Influence of Uncertain Factors on Vehicle Low Frequency Vibration and Control Rules*
Danna Jiang, Ying Huang, Donghao Hao and Peilin Dai

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- 3:50PM *A State Observer Design Based on EKF for Diesel Engine Urea-SCR System*
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- 4:05PM *Stabilization of a Class of High-Order Switched Stochastic Nonlinear Systems*
Ben Niu and Huan Li

- 4:20PM *Unscented Kalman Filter-Based Adaptive Tracking Control for Wheeled Mobile Robots in the Presence of Wheel Slipping*
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- 4:35PM *Optimization Current Computation of IPMSM Drive system for Electric Vehicles Based on the Projected Dynamic System*
Qinmu Wu, Linjie An and Min Cao
- 4:50PM *Active Noise Control Using STF for Time-Vary Delay Estimation in Secondary Path Based on DFxLMS*
Jia Sun, Chang-Yin Sun and Yao Yu
- 5:05PM *Optimization Algorithm for Vehicle Braking Force Distribution of Front and Rear Axles Based on Brake Strength*
Jinlong Xu and Xiangwen Zhang
- 5:20PM *Stochastic Linear Quadratic Control with Regional Pole Placement*
Jie Wang, Ting Hou and Hongji Ma
- 5:35PM *Coordinated Traffic Signal Control Method of Urban Expressway On-Ramp and Ground Intersections*
Yuguang Chen, Manrong Yuan, Wei Cheng, Haicheng Xiao and Huabao Ye

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