

CONFERENCE ABSTRACTS

Xiamen, China | January 10-12, 2020

EECR 2020

The 6th International Conference on Electrical Engineering, Control and Robotics

ICICC 2020

The 3rd International Conference on Intelligent Control and Computing



Holiday Inn Express Xiamen Airport Zone

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CONFERENCE AGENDA Xiamen, China | Jan. 10-12

■ January 10, 2020 -- Hotel Hall (1st Floor) ■

10:00-17:00	Pre-Registration
Ms. Jennifer Y. Luo & Ms. Cindy Lau	
<ul style="list-style-type: none"> • Pick up conference materials. • Certificate will not be available at the registration desk until you finish the presentation at the conference day (except the listeners and poster presenters); • Accommodation is not provided, and it's suggested to make an early reservation. 	

■ January 11, 2020 -- Jimei Hall (2nd Floor) ■

9:00-9:05	Welcome Address Prof. Fan Yang, Huaqiao University, China	
Keynote Speech		
Time	Speaker	Title
9:05-9:50	Prof. Chun-Yi Su Huaqiao University, China	Modeling and Control of Smart Actuators
9:50-10:35	Prof. Quang Ha University of Technology Sydney, Australia	Multiple UAVs with Summit Navigator for Smart Infrastructure Monitoring
10:35-11:15	Group Photo & Coffee Break & Poster Session I	
11:15-12:00	Prof. Tao Jin Fuzhou University, China	Research on Key Technologies of Control and Topology Optimization for Energy Router in High-Speed Electrified Railway Transit
12:00-13:30	Lunch @ Yuguo Hall (3rd Floor)	
Parallel Sessions		
Time	Session Number	Theme
13:30-15:30	Session I	Electrical Engineering and Intelligent Control Technology
15:30-16:00	Coffee Break & Poster Session II	
16:00-18:15	Session II	Computer and Intelligent Computing
18:00-20:00	Dinner @ Yuguo Hall (3rd Floor)	
January 12, 2020	Lab Visit (9:30-10:30)	

WELCOME ADDRESS Xiamen, China | Jan. 10-12

We are pleased to welcome you to join The 6th International Conference on Electrical Engineering, Control and Robotics (EECR 2020) and the workshop The 3rd International Conference on Intelligent Control and Computing (ICICC 2020), which takes place at Xiamen, China, during January 10-12, 2020.

We wish to express our sincere appreciation to all of the individuals who have contributed to EECR 2020 and ICICC 2020. Special thanks are extended to our colleagues in program committee for their thorough review of all the submissions, which is vital to the success of the conferences, and also to the members in the organizing committee and the volunteers who had dedicated their time and efforts in planning, promoting, organizing and helping the conference. Last but not least, our special thanks go to invited keynote speakers as well as all the authors for contributing their latest researches to the conference.

This conference program is highlighted by three keynote speakers: Prof. Chun-Yi Su, Huaqiao University, China; Prof. Quang Ha, University of Technology Sydney, Australia and Prof. Tao Jin, Fuzhou University, China.

One best presentation will be selected from each session, evaluated from: Originality; Applicability; Technical Merit; quality of PPT and English level. The best one will be announced at the end of each session, and be awarded the certificate at the end of the session.

Xiamen alternately known as Amoy. Xiamen and its surrounding countryside are known for its scenery and tree-lined beaches. Xiamen's Botanical Garden is a nature lover's paradise. Water Garden Expo Park has a total area of about 6.76 km² (2.61 sq mi), with a land area of 3.03 km² or 1.17 sq mi consisting of five exhibition park islands, four ecological landscapes islands and two peninsulas, including the main pavilion, Chinese Education Park, Marine Culture Island, Spa Island, and other functional areas and related facilities.

We wish you a successful conference and enjoyable visit in Xiamen.

EECR 2020
ICICC 2020
Organizing Committee

LOCAL INFORMATION Xiamen, China | Jan. 10-12

Xiamen is a coastal city in Fujian Province in China. It has been an important port for centuries and became one of China's earliest Special Economic Zones in the 1980s. The name Xiamen means "door to the house", referring to the city's centuries-old role as a gateway to China.

>>> Time

UTC/GMT+8

>>> Weather

The Weather Situation of Xiamen in January

Average daily minimum temperature

14°C

Average daily highest temperature

21°C

>>> Transportation

- ≡ Air: Gaoqi International Airport
- ≡ Train: Xiamen Railway Station (No.90, Xiahe Road, Siming District); North Railway Station (Yannei Village of Houxi Town in Jimei District)
- ≡ Long-Distance Bus: Hubin Long-distance Bus Station; Fanghu Bus Station; Wucun Bus Station; Jimei Bus Station; Xinglin Bus Station
- ≡ Ship: Xiamen International Cruise Terminal
- ≡ Ferry: Dongdu Port; Haicang Songyu Port; Xiamen Ferry Dock
- ≡ Metro
- ≡ City Bus
- ≡ Taxi

>>> Notice

- Wear your conference badges in an easily visible location at all times while within the conference area – this helps everyone identify you as a member of the event community.
- Never discard the participation badges at will. Be aware that no access for people don't have participation badges.
- For your property safety, please take good care of your valuables at any time during the conference venue and hotel area.
- Accommodation is not provided, and it's suggested to make an early reservation.

>>> Disclaimer

The conference organizer does not assume any responsibility for the loss of personal belongings of the participants.

CONFERENCE COMMITTEE Xiamen, China | Jan. 10-12

Conference Chairs

Chun-Yi Su, Huaqiao University, China

May Huang, International Technological University, USA

Conference Co-Chairs

Rencheng Zhang, Huaqiao University, China

Fan Yang, Huaqiao University, China

Program Chairs

Quang Ha, University of Technology Sydney, Australia

Xuelin Lei, East China University of Science and Technology, China

Local Organizing Chair

Feng Zhao, Huaqiao University, China

Local Organizing Committee

Chunqing Huang, Xiamen University, China

Xiangyu Luo, Huaqiao University, China

Yanzheng Zhu, Huaqiao University, China

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Long Jin, Lanzhou University, China

Dong Huang, Chinese Academy of Sciences, China

Samuel P. Kozaitis, Florida Institute of Technology, USA

Thelma D. Palaoag, University of the Cordilleras, Philippines
Mahir Dursun, Gazi University, Turkey
Konstantinos Parsopoulos, University of Ioannina, Greece
Kardi Teknomo, Ateneo de Manila University, Philippines
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Sheila Abaya, University of East-Caloocan, Philippines
B. B. Biswal, National Institute of Technology, India
KWOK Lam For, City University of Hong Kong
Cengiz ÖRENCİK, Beykent University, Turkey
Eric Chen, Uber, USA
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Emese Gincsiné Szádeczky-Kardoss, Budapest University of Technology and Economics, Hungary
Wen-Jyi Hwang, National Taiwan Normal University, Taiwan
Abdel-Hameed Badawy, New Mexico State University, USA
Simon K. S. Cheung, The Open University of Hong Kong, Hong Kong



Prof. Chun-Yi Su
Huaqiao University, China

Modeling and Control of Smart Actuators

Abstract: Smart actuators featuring high energy densities, large strokes and fast responses are playing an increasingly important role in micro/nano-positioning applications. However, hysteresis nonlinearities are very common in smart material-based actuators. For decades, the existence of such nonlinearities has provided one of the most difficult challenges to control design engineers since the entire Laplace domain and most state space control design techniques were developed exclusively for differentiable linear or nonlinear systems. Hence, the controllers were designed where the existence of hysteresis nonlinearities in practical systems were neglected. When the actuators are considered with hysteresis nonlinearities, these methods encountered substantial difficulties in the analysis, model fitting and control design stages. It was extremely difficult, if not impossible, to design or prove stability of such systems. The development of techniques for the identification of such nonlinearities in smart material-based actuators has emerged as a significant problem in itself. This talk is intended to discuss state-of-the-art solutions for modeling and control techniques of hysteresis effects in smart actuators. The presentation and discussion will range from modeling of hysteresis, to the design of corresponding control schemes, especially in the absence of complete information concerning the system model and state.

BIO: Dr. Chun-Yi Su received his Ph.D. degrees in control engineering from South China University of Technology in 1990. After a seven-year stint at the University of Victoria, he joined the Concordia University in 1998. He is currently a Professor at Huaqiao University, on leave from Concordia University. He has also held several short-time visiting positions including a Chang Jiang Chair Professorship by China's Ministry of Education and JSPS Invitation Fellowship from Japan, and Qian Ren Talents Professor from China. His research covers control theory and its applications to various mechanical systems, with a focus on control of systems involving hysteresis nonlinearities. He is the author or co-author of over 400 publications, which have appeared in journals, as book chapters and in conference proceedings. In addition to his academic activities, he has worked extensively with industrial organizations on various projects. Dr. Su has been an Associate Editor of IEEE Transactions on Automatic Control, IEEE Transactions on Control Systems Technology, Mechatronics, Control Engineering Practice, and several other journals. He has served as Chair/Co-Chair for numerous international conferences.



Prof. Quang Ha

University of Technology Sydney, Australia

Multiple UAVs with Summit Navigator for Smart Infrastructure Monitoring

Abstract: Surface inspection is essential for infrastructure monitoring for the use of unmanned aerial vehicles (UAVs) has been increasingly important. This keynote presents a real-time control system for surface inspection using a triangular formation of multiple UAVs and a novel image processing technique called the Summit Navigator. The UAVs are coordinated to collect data of the inspecting objects with communication and data transmission based on the Internet of Things (IoT). Here, a group of three UAVs is cooperatively controlled by using an angular-encoded particle swarm optimisation algorithm to follow a generated path and redistribute it to each UAV via IoT-based communication links for inspection tasks. Collected data are transmitted in real time through the network to remote computational units. Potential damage or defects can be detected by using the online summit navigator algorithm. Local maxima are extracted from histograms obtained from segmentation of captured images after a smoothing and peak searching process. The developed system is promising for health monitoring of smart infrastructure. Extensive simulation, experiments and comparisons have been conducted to verify the validity and performance of the proposed architecture for inspection of concrete cracks of built structures as well as steel bridge rust.

BIO: Quang Ha received the B.E. degree from Ho Chi Minh City University of Technology, Vietnam in Electrical Engineering in 1983, the PhD degree from Moscow Power Engineering Institute, Russia, in Complex Systems and Control in 1993, and from the University of Tasmania, Australia, in Intelligent Systems in 1997. He is currently an Associate Professor at the School of Electrical and Data Engineering of the Faculty of Engineering and Information Technology, University of Technology Sydney, Australia. His research interests include automation, robotics and control systems with a focus on construction automation. Dr Ha is a Senior Member of the IEEE and on the Board of Directors of the International Association of Automation and Robotics in Construction. He has been a Member of the Editorial Board of the IEEE Transactions on Automation Science and Engineering (2009-2013), Automation in Construction, Mathematical Problems in Engineering, Journal of Industrial Electronics & Applications, and Journal of Advanced Computational Intelligence and Intelligent Informatics. Quang Ha served as Chairman of several international conferences on automation and intelligent systems. He was the Video Chair for the IROS'2018. Dr Ha received 14 best paper awards from the IEEE, IAARC and Engineers Australia, including the Sir George Julius Medal in 2015.



Prof. Tao Jin

Fuzhou University, China

Research on Key Technologies of Control and Topology Optimization for Energy Router in High-Speed Electrified Railway Transit

Abstract: In modern society, people's Daily life, work and production are more and more inseparable from electricity, and the loss caused by power failure has a greater and greater impact on people, so ensuring the stability of power supply is an important issue in today's society. Based on the development of power electronic technology, computer technology, control theory, sensor technology, and other new technologies such as network communication technology, as the power access device of active distribution network, the most basic task of energy router is to manage the access and control power supply and seek the optimal path. When the energy router is used at the end of the distribution network, it is directly connected to the distributed power supply, distributed energy storage equipment and load. This presentation will mainly talk about the key technologies' research on energy router control and topology optimization especially for high-speed electrified railway transit.

BIO: Prof. Tao Jin received B.S. and M.S. degrees from Yanshan University in 1998 and 2001, respectively, and a Ph.D. degree in Electrical Engineering from Shanghai Jiaotong University in 2005. From 2005 to 2007, he worked as a postdoctoral researcher in Shanghai Jiaotong University. From 2008 to 2009, he held a research scientist position with Virginia Tech, Blacksburg, USA, where he was involved in the design and testing of PMU technology and GPS/internet-based power system frequency monitoring networks. In 2010, he joined Imperial College London, UK, as a European Union Marie Curie Research Fellow, where he was focused on electrical technologies related to smart grids. From 2009, he is a professor in the College of Electrical Engineering & Automation, Fuzhou University, China. Prof. Tao Jin is a senior member of IEEE, and members of the IEEE Power and Energy Society and the IEEE Industrial Electronics Society. He is also a special committee member of the Chinese Society of Electrical Engineering, the China Electro technical Society, and more. He currently serves as an Associate Editor for the China Measurement & Testing Technology, MPCE, PCMP, and other journals.

PRESENTATIONS GUIDELINE Xiamen, China | Jan. 10-12

Oral Presentation

- Speakers are requested to be in their respective session rooms at least 10 minutes prior to the commencement of each session. And copy your presentation to conference laptop.
- The duration of a regular presentation is 15 minutes, including 12 minutes for the presentation and 3 minutes for Q&A. We would appreciate if all presenters can adhere strictly to this time limit.
- Presentation must be carried out using Microsoft PowerPoint or PDF.
- The certification of Oral Presentations will be awarded after each presentation.
- To show the respect to other authors, especially to encourage the student authors, we strongly suggest you attend the whole session, the scheduled time for presentations might be changed due to unexpected situations, please come as early as you could.
- Session Photo will be taken at the end of the session.

Poster Presentation

- The size of poster is 60cm * 80cm.
- Poster presenter can leave your post at the registration desk and our staff will help you to put up the posters at least 1 hour prior to the commencement of each poster session.
- At least one author should be present for each poster during the poster session.

Instructions for Presiders

Please time the presentation. Remind the speaker as follows:

- It is a good idea to remind your speakers at the start of the session that you will timing the speech. Please remember the time frame. Keeping the program to time is very important. Please be aware of the time periods speakers have been designed to present.
- If someone in your session didn't show up, please go on with next speaker, and recall the missing one every time when it's next speaker's turn. In this case, we require the speakers of each session should stay the whole session.

QUICK GLANCE OF PRESENTATIONS

Oral Session I — Electrical Engineering and Intelligent Control Technology

13:30-15:30

- R025** The Realization of Intelligent Knowledge Adaptive Learning Method in the Field of Substation Operation and Maintenance
- R026** A Fiber-Optic Current Sensor Based on Fuzzy PI Control
- R012** Deadbeat Predictive Current Control with Disturbance Observer for Permanent Magnet Synchronous Motor
- R014** A Novel Method for Implementing Harmonic Compensation with Multi-Inverters in a Micro-Grid
- R027** Humanoid Robot Torso Motion Planning Based on Manipulator Pose Dexterity Index
- R054** Active Magnetic Bearing Design and Backstepping-Adaptive Control for High-Speed Rotors
- R013** Minimum-time Trajectory Planning for Residual Vibration Suppression of Flexible Manipulator Carrying A Payload
- R045** Gait Phase Classification Based on sEMG Signals Using Long Short-Term Memory for Lower Limb Exoskeleton Robot

Oral Session II — Computer and Intelligent Computing

16:00-18:15

- R0021** A Decision-Making Technique for Solving Order Allocation Problem Using Genetic Algorithm
- R0019** Complex Morphological Filtering Algorithm Based on Multi-structure Elements
- R0028** Research on Target Detection of Carrier-Based Aircraft Based on Deep Convolutional Neural Network
- R006** GIS Partial Discharge Patterns Recognition with Spherical Convolutional Neural Network
- R015** On Computation of Fractional-Order Differentiations
- R017** Complex Network Community Detection based on Genetic Algorithm using K-cliques
- R043** 3-D Localization of UAV and Detection based on Harmonics Index and Spectral Entropy Criteria
- R039** A Non-Intrusive Home Load Identification Method Based on Adaptive Reinforcement Learning Algorithm
- R0004** Allocation of Resources in Different Types of PPP Projects based on DEA-Game Model in A Competition Environment

Poster Session I — Electrical Engineering and Automation

- 1 R019** Secondary Control of Island Microgrid Based on Distributed Multi-Agent System under Symmetric Time Delay
- 2 R016** Research on Dynamic Relationship between Urban Rail Transit and Power Consumption
- 3 R0022** The Optimized Layout Strategy of Ring Oscillator Network for Trojan Detection
- 4 R022** Double-layer Electricity Market Trading Strategy for Microgrids Based on Multi-agent System
- 5 R041** Simulation Analysis of Magnetizing Inrush Current of 500kV Transformer
- 6 R1004** Study on the Reactive Power Coordinated Control in Hybrid Parallel HVDC System
- 7 R049** The Modification of Line Parameters in Distribution Network Considering the Electro-thermal Coordination
- 8 R029** Study on Characteristics of No-Load Converter Transformer Closing Accessing to High-Cable Rate Network
- 9 R0020** Design of Power Well Cover Wireless Monitoring System Based on FreeRTOS and NB-IoT Technology
- 10 R031** Safety Evaluation of Microgrid Using Chaotic Time Series and RBF Neural Network
- 11 R047** Study on the Transformer Protection Scheme Based on Double Thresholds and Waveform Similarity
- 12 R036** DFIG Model Suitable for SSR Research
- 13 R050** Low Frequency Oscillation Online Identification Based on Synchronous Phasor of Distribution Network
- 14 R035** Research on Optimizing the Recovery Strategy of a Distribution Network Communication System under Extreme Disasters
- 15 R0024** A Method of Automatic Generation of Daily Work Report for Power Dispatching Based on RoBERTa
- 16 R0013-A** Optimal Injection-point Decision of the Photovoltaic Generation with Energy Storage System
- 17 R021** Prediction of Short-term PV Output Power Based on PCA-Stacking under Different Weather Conditions

Poster Session II — Computer and Control Automation

- 1 **R0027** Respiratory Detection Using Non-Contact Sensors
- 2 **R003** Recursive-Biased-Generalized-Inverse Method for Thrust Allocation for Dynamic Positioning Vessels with Non-Rotatable Thrusters and Force Constraints
- 3 **R023** Research on Adaptive Reclosing Discriminant Method Based on LMD Sample Entropy
- 4 **R024** Design and Implementation of a Device for Reducing Road Accident at Foggy, Rainy & Drowsy Conditions.
- 5 **R028** Analysis of the Influence of Flux Detector on the Subsynchronous Oscillation Characteristics of DFIG
- 6 **R038** R-MUCH: A Clustering Routing Algorithm Using Fuzzy Logic For WSNs
- 7 **R1003** New Design of All-terrain Smart Car Based on Arduino
- 8 **R0008** UFSP-Net: A Neural Network with Spatio-Temporal Information Fusion for Urban Fire Situation Prediction
- 9 **R0010** Cattle Identification Using Muzzle Print Images Based on Feature Fusion
- 10 **R0012-A** Improved Bacterial Foraging Algorithm for Optimal Economic Dispatch
- 11 **R0011** An Enhanced Stochastic Algorithm for Optimal Contract Capacity of Furniture Store
- 12 **R010** A Non-Linear Improved Double-Integral Sliding Mode Controller (IDI-SMC) for Modeling and Simulation of 6 (DOF) Quadrotor system.
- 13 **R0026** Fatigue Detection Based on Multi-Feature Fusion of Fatigue Behavior
- 14 **R053** A Mobile Robot Recognize Blurred Targets via An Improved Histogram Equalization
- 15 **R0023** A Review of Artificial Intelligence Techniques for Selection & Evaluation
- 16 **R008** Study on Insulation Characteristics of Scratch Defects in 35kV XLPE Cable Terminals
- 17 **R056** Research on the Civil-Military Integration Logistics Support System of Warships
- 18 **R040** A security Assessment of Distribution Network CPS Based on Association Matrix Modeling Analysis