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Message from General Chairs

Zheng Guo LI
General Chair

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On behalf of the Organising Committee, we would like to extend to you our warmest welcome to the 15th IEEE Conference on Industrial Electronics and Applications (ICIEA 2020), 9-13 November 2020, Kristiansand, Norway. Established in 2006, the ICIEA series of annual conferences have served as an excellent forum for scientists, researchers, engineers and industrial practitioners from around the world to network and to share the latest technology advancements and future trends in industrial electronics and its board applications. This year, it marks the 15th Anniversary of the ICIEA conferences.

ICIEA 2020 is organized by the University of Agder, Norway, the IEEE Industrial Electronics Chapter of Singapore, and the IEEE Singapore Section. It is sponsored both technically and financially by the IEEE Industrial Electronics Society.

Kristiansand is considered the capital of Southern Norway and the heart of the region. It is the fifth largest city in Norway, with 92,000 inhabitants. The city is home to global leaders in the oil and gas service industry, which has helped put Kristiansand on the world map and make Vest-Agder Norway's largest export county per capita. Through innovation, this industry has successfully maintained its position in the global market. Kristiansand has been a driving force in promoting positive city and town development and was awarded Staten's pris for Attraktiv By (the Government's Attractive City Award) in 2018.

University of Agder (UiA) has 13,000 students and 1,400 faculty and staff members. It is one of the most modern universities in Norway, and it is still growing and consolidating its position for its high-quality research and study programs both on the national and international level. UiA seeks to be an open and inclusive university that is characterized by a culture of cooperation and aims to be on the cutting edge of innovation, education and research.

ICIEA 2020 received overwhelming responses with more than 510 submissions from 31 countries/regions. All submitted papers were processed by the Technical Program Committee and rigorously peer-reviewed by a select panel of international researchers. Its technical program consists of 342 papers arranged in 50 regular/invited/special sessions. In addition to the parallel technical sessions, there are three Keynotes to be delivered by internationally renowned professors and researchers. The official conference proceedings will be published by IEEE and included in the IEEE Xplore database.

We are extremely honoured to have Professor Miroslav Krstic from University of California San Diego, USA, Professor Haizhou Li from National University of Singapore, Singapore, and Professor Ing. Armando Walter Colombo from University of Applied Sciences Emden/Leer as the keynote speakers. We would like to express our sincere appreciation to our Keynote speakers for their support and contribution to ICIEA 2020.

It is our honour to have the opportunity to thank all organisers of the special sessions and invited sessions and the numerous researchers worldwide who have helped to review and comment the submitted papers. We are thankful for the invaluable advice, support and assistance rendered by the members of our distinguished International Advisory Committee. We would like to express our sincere acknowledgement of the technical sponsorship provided by the IEEE Industrial Electronics Society and IEEE Singapore Section.

We thank all delegates for your long-lasting and strong support, without which the success of ICIEA is not imaginable. We are grateful to our friends, colleagues and family members who have helped the conference directly or indirectly, one way or another.

We wish all of our delegates a fruitful, rewarding, enjoyable and memorable virtual conference experience on-line.

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Ziyang Liu

Keynote Speeches

Keynote Speech I	**DIN SPEC 91345 RAMI4.0-based Engineering of Industrial Cyber-Physical Systems**
Date/Time	10 Nov 2020 / 09:00 – 10:00 hrs
Speaker	Professor Dr.-Ing. Armando Walter Colombo *The Department of Electrotechnical and Industrial Informatics at the University of Applied Sciences Emden-Leer, Germany*
Chair	Dr. Jingbing Zhang

Biography

He joined the Department of Electrotechnical and Industrial Informatics at the University of Applied Sciences Emden-Leer, Germany, became Full Professor in August 2010 and Director of the Institute for Industrial Informatics, Automation and Robotics (I2AR) in 2012.
Prof. Colombo worked also during the last 17 years as Manager for Collaborative Projects and also as Edison Level 2 Group Senior Expert at Schneider Electric, Industrial Business Unit.
Prof. Colombo received the BSc. on Electronics Engineering from the National Technological University of Mendoza, Argentina, in 1990, the MSc. on Control System Engineering from the National University of San Juan, Argentina, in 1994, and the Doctor degree in Engineering from the University of Erlangen-Nuremberg, Germany, in 1998. From 1999 to 2000 was Adjunct Professor in the Group of Robotic Systems and CIM, Faculty of Technical Sciences, New University of Lisbon, Portugal.

Prof. Colombo has extensive experience in managing multi-cultural research teams in multi-regional projects. He has participated in leading positions in many international research and innovation projects.

His research interests are in the fields of industrial cyber-physical systems, industrialdigitalization and system-of-systems engineering, Internet-of-Services, Industry 4.0-compliant solutions.

Prof. Colombo has over 30 industrial patents and more than 300 per-review publications in journals, books, chapters of books and conference proceedings. With his contributions, he has performed scientific and technical seminal contributions that are nowadays being used as one of the basis of what is recognized as “The 4th Industrial Revolution” and are penetrating the daily life, producing visible societal changes and impacting all levels of the society. He is co-founder of three IEEE IES Technical Committees (i) on Industrial Agents, (ii) on Industrial Informatics and (iii) on Industrial Cyber-Physical Systems. He is also member of the IEEE IES Administrative Committee (AdCom).

Prof. Colombo served/serves as advisor/expert for the definition of the Research and Innovation priorities within the Framework Programs FP6, FP7 and FP8 (HORIZON 2020) of the European Union, and he is working as expert/evaluator in the European Research Executive Agency (REA), ECSEL Platform, Eureka- and German BMBF/DLR Programs, as well as Digital Supercluster Canada, National R&D-Programs in Sweden, Denmark, Italy, Switzerland, etc.

Prof. Colombo is listed in Who’s Who in the World/Engineering 99-00/01 and in Outstanding People of the XX Century (Bibliographic Centre Cambridge, UK).

Abstract

Industry 4.0 is a collective term for technologies, concepts and novel business approaches, formalized under the DIN Specification 91345 RAMI4.0, that covers the whole industrial value chain, combining Cyber-Physical Systems, the Internet-of-Things and the Internet-of-Services. After presenting the scientific and technical background behind Industrial-Cyber-Physical- Systems (ICPS), the audience/participants of the Plenary Keynote will get a deep view about: – Digitalization and Networking of the economy. Principles. – Building industrial eco-systems of digitalized and networked things/assets. Industry 4.0. – Formalizing the digitalization and networking principles with the DIN Specification 91345 RAMI4.0 – Understanding why and how to navigate the 3D-model RAMI4.0 in order to fulfilling the major requirements for engineering the digitalization of the industrial value stream and the life cycle of ICPS? – Understanding how to migrate from Industry 3.0 to Industry 4.0 environments. Analysis and discussion of results of exemplary innovation projects. – Overviewing a core curriculum for educating engineers at Master Level in Industry4.0 / Industrial Cyber-Physical Systems. Master on Industrial Cyber-Physical Systems of the DAAD / CUAA-DAHZ, Germany-Argentina.

Keynote Speech II	**Speech Processing at Cocktail Party**
Date/Time	10 Nov 2020 / 10:00 – 11:00 hrs
Speaker	Professor Haizhou Li *Department of Electrical and Computer Engineering, National University of Singapore, Singapore Bremen Excellence Chair Professor, University of Bremen, Germany*
Chiar	Prof. Wenjian Cai

Biography

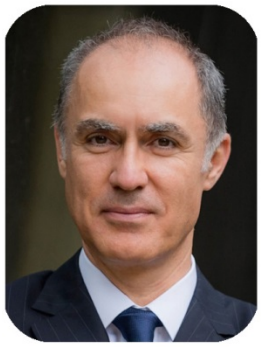
Haizhou Li is a Professor at the Department of Electrical and Computer Engineering, National University of Singapore, and a Bremen Excellence Chair Professor at the University of Bremen, Germany. His research interests include speech information processing, natural language processing, and neuromorphic computing. Professor Li has served as the Editor-in-Chief of IEEE/ACM Transactions on Audio, Speech and Language Processing (2015-2018), the President of the International Speech Communication Association (ISCA, 2015-2017), and the President of Asia Pacific Signal and Information Processing Association (APSIPA, 2015-2016). He is a Fellow of the IEEE and the ISCA.

Abstract

Humans have a remarkable ability to pay their auditory attention only to a sound source of interest, that we call selective listening, in a multi-talker environment or a Cocktail Party. However, signal processing approach to speech separation and/or speaker extraction from multi-talker speech remains a challenge for machines. In this talk, we study the deep learning solutions to monaural speech separation and speaker extraction that enable selective listening, speech recognition, speaker recognition at Cocktail Party. We discuss the computational auditory models, technical challenges and the recent advances in the field.

Keynote Speech III	**Extremum Seeking and its Applications**
Date/Time	11 Nov 2020 / 15:00 – 16:00 hrs
Speaker	Professor Miroslav Krstic *Mechanical and Aerospace Engineering, Director of the Cymer Center for Control Systems and Dynamics, UC San Diego, USA*
Chiar	Prof. Jing Zhou

Biography



Miroslav Krstic is Distinguished Professor of Mechanical and Aerospace Engineering, holds the Alspach endowed chair, and is the founding director of the Cymer Center for Control Systems and Dynamics at UC San Diego. He also serves as Senior Associate Vice Chancellor for Research at UCSD. As a graduate student, Krstic won the UC Santa Barbara best dissertation award and student best paper awards at CDC and ACC. Krstic has been elected Fellow of seven scientific societies – IEEE, IFAC, ASME, SIAM, AAAS, IET (UK), and AIAA (Assoc. Fellow) – and as a foreign member of the Serbian Academy of Sciences and Arts and of the Academy of Engineering of Serbia. He has received the SIAM Reid Prize, ASME Oldenburger Medal, Nyquist Lecture Prize, Paynter Outstanding Investigator Award, Ragazzini Education Award, IFAC Nonlinear Control Systems Award, Chestnut textbook prize, Control Systems Society Distinguished Member Award, the PECASE, NSF Career, and ONR Young Investigator awards, the Schuck ('96 and '19) and Axelby paper prizes, and the first UCSD Research Award given to an engineer. Krstic has also been awarded the Springer Visiting Professorship at UC Berkeley, the Distinguished Visiting Fellowship of the Royal Academy of Engineering, and the Invitation Fellowship of the Japan Society for the Promotion of Science. He serves as Editor-in-Chief of Systems & Control Letters and has been serving as Senior Editor in Automatica and IEEE Transactions on Automatic Control, as editor of two Springer book series, and has served as Vice President for Technical Activities of the IEEE Control Systems Society and as chair of the IEEE CSS Fellow Committee. Krstic has coauthored thirteen books on adaptive, nonlinear, and stochastic control, extremum seeking, control of PDE systems including turbulent flows, and control of delay systems.

Abstract

Extremum seeking (ES) is a method for solving optimization problems without the knowledge of the operating map, using only the measurements of the output of the map. Tackling similar problems as evolutionary/genetic algorithms, ES was invented half a century earlier within the early control community and is well suited for real-time implementation on plants with significant dynamics. Modern ES algorithms, developed since 2000, are capable of guaranteeing stability, and even prescribed rates of convergence in spite of the plant model and the performance index function being unknown. I will overview some fundamental ES results, including deterministic and ES algorithms, ES for non-cooperative games, and extensions of ES from gradient to Newton based updates. Many hundreds of applications of ES have emerged since 2000. I will highlight source seeking for autonomous vehicles in GPS-denied environments, MPPT for solar and wind energy sources, liquid tin droplet targeting by lasers in semiconductor photolithography, and a Mars Rover application.

Invited and Special Sessions

Special Session on Future Robotics Technologies and Applications
Organizers: Jingbing Zhang, Zhengguo Li

Invited Session on Advanced Control Technologies For Power Electronics and Applications
Organizers: Chuanlin Zhang and Fanghong Guo

Invited Session on Condition monitoring in power electronics and electrical machines
Organizers: Prof. Khang Huynh and Dr. Surya Kandukuri

Invited Session on Distributed Renewable Energies: Modeling, Planning, Regulation and Application
Organizers: Qian Zhang and Ming Wu

Invited Session on Motor-drive servo system: Modeling, Analysis, Structure/Controller/compensator Design and Optimization
Organizers: Jiwen Zhao and Qian Zhang

Invited Session on Autonomous vehicle state-of-the-art, challenges and future road map
Organizers: Prof. Ajit Jha

Invited Session on Advanced control technologies for robotic system and its applications
Organizers: Dr. Yiming Jiang and Prof. Chenguang Yang

Invited Session on Power Converters for Energy Router: Topologies, Advanced Control Strategies and Applications
Organizers: Jingjing Huang, Benfei Wang

Invited Session on Advanced Control Methodologies for Uncertain Dynamical Systems with Industrial Applications
Organizers: Wei Wang, Jiangshuai Huang

Invited Session on Social Manufacturing: Theories and Applications
Organizers: Gang Xiong, Lijun Jiang

Invited Session on Advanced Control and Topology for Railway Traction Drive System
Organizers: Prof. Song Wensheng, Prof. Lv Gang

Invited Session on Power Electronics Application Technologies in Rail Transit: Intelligent Interface Design, Advanced Control Strategies, Modelling and Reliability
Organizers: Prof. Xiaoqiong He, Prof. Cao Yuan

Special Session on Smart manufacturing System and Data Analytics
Organizers: Dr Junhong Zhou

Special Session on PHM Application with Big Data Methods
Organizers: Guo Yangming and Zhu Peican

Special Session on Advanced Mechatronics in Offshore Systems
Organizers: Prof. Houxiang Zhang, Prof. Jing Zhou

Invited Session on Advanced Control Methods in Flight Vehicles and Applications
Organizers: Dr. Xiangbin Liu

Invited Session on Advanced Modeling, Analysis and Control Techniques and Emerging Applications of Modular Multilevel Converters
Organizers: Jinyu Wang, Shunfeng Yang

Invited Session on Hybrid Energy Storage Topologies, Advanced Control Strategies and Applications in Power System Operation, Control and Planning
Organizers: Xiaoqing Han, Peng Wang

Invited Session on Grid-connected and isolated renewable energy systems
Organizers: Prof. Xiaoqiang Guo, Prof. Mariusz Malinowski, Prof. Elisabetta Tedeschi

Invited Session on Image Processing and Data Analysis for Engineering and Biomedical Application
Organizers: Dr. Lijun Jiang, David and Dr. Huiqi Li

Special Session on Advanced techniques towards more electrified and intelligent mobility
Organizers: Dr. Wei Zhongbao, Dr. Jiang Chaoyang

Special Session on Design for Electrical Components and Systems
Organizers: Prof. Yang Bo, Prof. Yang Chunling

Special Session on System Control and Modeling
Organizers: Prof. Wang Xingjian, Prof. Wu Shuai

Special Session on System Design and Test
Organizers: Prof. Yu Jinsong, Prof. Xiao Jin

Special Session on System Simulation and Analysis
Organizers: Prof. Li Yunhua, Prof. Jia Qingxuan

Special Session on Modelling and Control of Robots
Organizers: Prof. Pei Zhongcai, Prof. Chen Gang

Special Session on Computer Vision and Pattern Recognition
Organizers: Prof. Zhang Baochang, Prof. Zhang Yan

Special Poster Session
Organizers: Prof. Chen Weihai, Prof. Zhang Chao

Special Session on Signal and Information Processing
Organizers: Prof. Yimin Zhou and Ms. Zheng Jing

Technical Programme

Session: LS01	Best Paper Award Selection
Date and Time	11 November 2020, 09:00 – 11:00 hrs

P1310 **MegaSense: Cyber-Physical System for Real-time Urban Air Quality Monitoring**
Andrew Rebeiro-Hargrave, Naser Hossein Motlagh, Samu Varjonen, Eemil Lagerspetz, Petteri Nurmi and Sasu Tarkoma

P1498 **Model Predictive Control and Disturbance Compensation for Engine Test Beds**
Dennis Erdogan, Stefan Jakubek and Christoph Hametner

P1516 **A Novel High Frequency Isolated Three-Level Inverter and Its Topological Derivation Method**
Yue Guan, Lei Li and Jinchuan Zhang

P1517 **Adaptive Weighted Robust Principal Component Analysis**
Zhengqin Xu, Yang Lu, Jiaxing Wu, Rui He, Shiqian Wu and Shoulie Xie

P1586 **A Temporal Forecasting Driven Approach Using Facebook's Prophet Method for Anomaly Detection in Sewer Air Temperature Sensor System**
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P1544 **Multiple Screen Control Application with Facial and Gesture Recognitions in a Manufacturing Control Room**
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P1040 **Design of a Novel Device for Measuring the Inertia of Helmet**
Xiao Chen, Cong Zhang, Wei Zhang, Chuang Ma and Jianwei Niu

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Hongmei Yan and Mingyi He

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Zhao Duo, Huang Chenxi, Tang Qichao and Zhang XiaYing

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Ying Liu, Zhanlong Dong, Keng Pang Lim and Nam Ling

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Bingyu Wang, Qiuye Sun and Dazhong Ma

P1221 **Health Status Evaluation of Intelligent Power Distribution Room based on AHP- Entropy method**
JunPing Luo, GuangHui Sun,Chao Shang, LingSen Chen, Bin Li and Jun He

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Xianshan Li, Yurun Shao and Fengda Zhao

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Min Zhu, Sheng Yi, Chunling Yang and Rongwei Feng

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P1633 **Image Encryption Based on Fractional-Order Chen Hyperchaotic System**
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Huan Yang, Yangming Guo, Xiaodong Wang, Hongjing Yao, Zhuqing Wang and Geng Li

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Babak Mohajeri, Ilkka Kauranen, Timo Nyberg, Elina Ilen, Mark Nelson and Gang Xiong

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P1216 **Inertia Estimation for PMSM Drive System Using Artificial Neural Network**
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P1619 **Adaptive Robust Control of the Cable Driven System for Position Tracking**
Bin Li, Liang Yan, Liqin Zhang and Christopher Gerada

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Ujjwal Datta, Juan Shi, Akhtar Kalam and Jiangrong Li

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QuangDuy Nguyen, Tieshan Li, Jun Ning and Yue Wu

P1116 **An Efficient Motion Trajectory Planning Method in CNC System**
Yanshu Lang, Dong Yu, Wenye Han and Shujie Sun

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P1274 **An Efficient Feedrate Dynamic Planning Method in CNC System**
Yanshu Lang, Dong Yu, Wenye Han, Shujie Sun and Mingxia Li

P1331 **Performances Assessment of Five-Phase Vienna Rectifier – PMSG SET: Experimental Validation of DC Bus Voltage Control**
Abdoulaye Dieng and Jean-Claude Le Claire

P1118 **INTSMC-Based Fault Tolerant Control Approach for a 2-DOF Robotic System**
Yashar Shabbouei Hagh, Reza Mohammadi Asl, Afef Fekih and Heikki Handroos

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Jan Einar Gravdal, Robert Ewald, Nejm Saadallah, Sonja Moi, Dan Sui and Roman Shor

P1313 **Optimal Control Design for a Group of Mobile Robots with Uncertainties**
Askhat Diveev and Elizaveta Shmalko

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Alexey Zhirabok, Alexander Zuev and Alexey Shumsky

P1145 **Modeling and Analysis of Sensor Uncertainty for Non-Iterative Air Balancing Methods**
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Yangyang Yuan, Bin Liu, Huizhong Hu and Zheng Jiang

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Qi Zhang, Bin Liu and Weihua Huang

P1435 **Unbalanced Voltage Control of Bipolar DC Microgrid Based on Distributed Cooperative Control**
Meihui Yang, Ruixuan Zhang, Niancheng Zhou and Qianggang Wang

P1349 **Output Consensus of Heterogeneous Linear Multi-Agent Systems with Unbounded Distributed Transmission Delays**
Cong Bi, Xiang Xu, Lu Liu and Gang Feng

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P1444 **An Air Balancing Method based on Distributed Finite-Time Control for the Ventilation Duct System**
Zhangjie Liu, Wenjian Cai, Xin Zhang and Can Cui

P1179 **Multi-Tasking Syetem Design for Multi-Axis Synchronous Control of Robot Based on RTOS**
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Danxu Zhao, Xiangbin Liu, Qi Han and Gongping Zhang

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Zijun Zhang, Guansong Xiong, JunWang, XinhuaZhang, Shuai Wang and Xingjian Wang

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Yang Chunling, Zhendong Zhang, Zhang Tongyiyu and Yan Zhang

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Chaohua Dai, Zhentao Yang, Fangli Shi, Qin Zhang, Yun Du and Jiayi Liang

P1095 **Energy Management Strategy Based on a New Adaptive Filtering Algorithm for Battery-Ultracapacitor Electric Vehicles**
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Zhe Cheng, Minwu Chen, Yuanli Liu and Yilin Cheng

P1285 **An Advanced Traction Power Supply System in Electrified Railway**
Yilin Cheng, Minwu Chen, Zhe Cheng and Ruofei Liu

P1606 **Virtual Inertia Adaptive Control Strategy for DFIG Wind Turbines Based on Exponential Function**
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Yan Zhang Gu, Zheng Rong Wu, Ji Guang Zhao, Li Qun Han, Lu Lu Yuan and Wen Tao Huang

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P1524 **Comparison of ESS Configurations and IC Control Technologies in Islanded Hybrid AC/DC Microgrids**
Yu. Xiao, X. Q. Han, Y. B. Jia, L. Wang, D. K. Liang and C. G. Ren

P1590 **Optimal Hybrid Energy Storage Sizing for Co-phase Traction Power Supply System Based on Grey Wolf Optimizer**
Hong Xie, Yuanli Liu, Zhe Cheng and Yilin Cheng

P1155 **Energy Storage System as Auxiliaries of Internal Combustion Engines in Hybrid Electric Ships**
Seungwan Nam, Daeseong Park and Mehdi Karbalaye Zadeh

P1464 **Washout Filter-Based Decentralized Control Scheme for Economic Operation of Islanded AC/DC Microgrids**
Shunwei Zheng, Jun Zhang, Kai Liao, Jianwei Yang and Yangjun Xu

P1512 **Uncertainty Analysis of Wind Power Based on Levelized Cost of Energy**
Mi Dong, Ya Li, Dongran Song, Beibei Liu, Lingqi Fang and Quanxu Lv

P1171 **Detection of Users-Transformer Relationship in the Secondary Power Distribution System with Smart Meter Data**
Wei Hu, Yue Liu, Qiuting Guo, Jian Wang, Yunlong Wang and Zhiyang Zhao

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Naixuan Zhu, Daozhuo Jiang, Pengfei Hu and Yifan Yang

P1293 **Review on Reliability Evaluation of Urban Integrated Energy System based on Multi-Source Data**
JunPing Luo, JiGuang Zhao, LiQun Han, LuLu Yuan, Bin Li and Jun He

P1110 **An Easy-to-Characterize Electrochemical Model for Lithium-Ion Batteries and Its Metaheuristic Parametrization**
Sung Wook Paek, Sivagaminathan Balasubramanian and Sangtae Kim

P1021 **Intrinsic Thermal Couples for Measurement in High Temperature and High Heat Flux Environment**
Z.C. Feng, J.K. Chen and Yuwen Zhang

P1467 **Stochastic Model Predictive Control for the Yaw Control System of Horizontal-Axis Wind Turbines**
Jian Yang, Lingqi Fang, Dongran Song, Ya Li, Beibei Liu and Quanxu Lv

P1108 **Multi-Objective Capacity Optimization of Integrated Energy System with Compressed Air Energy Storage**
Haiyang Wang, Ke Li, Chenghui Zhang and Xin Ma

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P1099 **A Study on Low-Temperature Model Parameter Identification of LTO Battery by Cuckoo Search**
Fan Lu, Dong Liu, Yang Liu, Zhenwei Li, Qilong Jiang and Yuanlong Chen

P1109 **An Ultra-Short-Term Prediction Method for Wind Speed Series based on Gaussian Process Median Regression**
Lupan Wang, Ke Li, Zhengping Ji and Chenghui Zhang

P1246 **Variable Time Constant Smoothing Strategy Based on Wind Power Flattening Index**
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P1458 **Research on SOC Estimation of Lithium Battery based on GWO-BP Neural Network**
Zhenwei Li, Dong Liu, Fan Lu, Xidan Heng, Yudi Guo and Qilong Jiang

P1463 **Lithium Battery SOC Estimation Based on Improved Unscented Kalman Filter**
Jieyu Hu, Songrong Wu, YiYang Wang, Fan Lu and Dong Liu

P1317 **Optimal Rural Integrated Energy System Configuration against the Background of the Rural Energy Transformation Strategy**
Yongle Zheng, Yueping Xiang, Wenmin Hu, Huixuan Li, Yao Wang and Limei Xu

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P1623 **Stereo Refinement Based on Gradient Domain Guided Filtering**
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P1150 **Image Based Visual Servoing for Landmine Detection using Quadrotors**
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Jianyin Fan, Jing Jin and Qiang Wang

P1295 **Guidelines to Select Between Self-Contained Electro-Hydraulic and Electro-Mechanical Cylinders**
Daniel Hagen, Damiano Padovani and Martin Choux

P1413 **A Dynamic Surface Controller based on Adaptive Neural Network for Dual Arm Robots**
Hai Xuan Le, Linh Nguyen and Karthick Thiyagarajan

P1323 **Laser Triangulation 3D Point Cloud Sensor with Long Range and Large Field of View**
Knut Berg Kaldestad and Geir Hovland

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P1102 **A Sign Language Interaction System Based on Pneumatic Soft Hand**
Hongxu Ma, Qiang Wang, Xiang Ma and Mohamed E. M. Salem

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Jianhua Wang, Pinghua Ai, Jianbin Zhang, Weihai Chen and Wenjie Chen

P1187 **Application of Image-Based Visual Servoing on Autonomous Drones**
Trinadh V S N Venna, Sarosh Patel and Tarek Sobh

P1267 **A Agricultural Spraying and Fertilization Robot based on Visual Navigation**
Jiandong Mao, Wenqi Niu, Hongyan Wang, Bai Zhang, Zhen Cao, Zhen Guo, Hu Zhao, Chunyan Zhou and Xin Gong

P1567 **A Brief Survey: Deep Reinforcement Learning in Mobile Robot Navigation**
Haoge Jiang, Han Wang, Wei-Yun Yau and Kong-Wah Wan

P1298 **Navigation Path Curve Extraction Method Based on Depth Image for Combine Harvester**
Wenjun Jiang, Pengfei Wang and Qixin Cao

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P1178 **Trajectory Sampling and Fitting Restoration Based on Machine Vision for Robot Fast Teaching**
Feng Zheng, Fang Fang and Xudong Ma

P1189 **A Wearable Body Motion Capture System and Its Application in Assistive Exoskeleton Control**
Zheng Zhao, Weihai Chen, Yang Li, Jiahua Wang and Zhongcai Pei

P1270 **A Bio-inspired Spiking Neural Network for Control of A 4-DoF Robotic Arm**
Xinyi Chen, Wenxin Zhu, Yunxiang Dai and Qinyuan Ren

P1611 **Controlled Propulsion of Asymmetric Janus Microdimer Swimmers under Rotating Magnetic Fields**
Shimin Yu, Tianlong Li and Shaopeng Wu

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P1115 **Study on Temperature Rise Test of Valve Bridge Arm Reactor for VSC-HVDC System Based on Equivalent Loss**
Junlin Zhu, Linjie Zhao and Ruihai Li

P1339 **Winding Temperature Analysis of 3-D Wound Core Transformer Under Overload and Short-Circuit Conditions**
Jiazhu Xu, Jie Zhou, Yaqian Yang and Jing Xia

P1408 **A Non-Contact SiC Power MOSFETs Health Status Monitoring Method Based on Magnetic Field Detection Technology**
Jiuzhu Zhang, Mingyao Ma, Na Meng, Weisheng Guo, Shuying Yang and Xing Zhang

P1500 **250kW High-Frequency Transformer Design and Verification for MVDC Collection System for Renewable Energy Resources**
Xin Zhan, Zhongbing Xue, Guangfu Ning, Ke Zhang, Wu Chen and Yibin Tao

P1597 **An Optimized Fault Feature Extraction Method for PV Grid-Connected T-Type Three Level Inver**
Xuesong Meng, Mingyao Ma, Feng Ling, Fusheng Wang, Zhenbin Zhang and Pinjia Zhang

P1107 **Enhancing Short Circuit Ruggedness of 1.7 kV IGBTs using a Gate-Source-Shorted Depletion-Mode MOSFET in Series with the Emitter**
Ajit Kanale and B. Jayant Baliga

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P1031 **A Paralleled SiC MOSFET Half-bridge Unit With Distributed Arrangement of DC Capacitors**
Jianzhen Qu, Yifan Yu, Qianfan Zhang and Shumei Cui

P1306 **Rotating Power Electronics for Electrical Machines and Drives – Design Considerations and Examples**
Jonas Kristiansen Nøland and Marta Molinas

P1402 **Research on Power Electronic Transformers Based on Virtual Synchronous Machine Control**
Jiaxin Wei, Songrong Wu, Yang Zhou, Ping Yang and Qian Kong

P1453 **DC Solid State Circuit Breaker Based On GaN**
Qian Kong, Songrong Wu, Feihu Zhang, Ping Yang, Yang Zhou and Jiaxin Wei

P1618 **DC-DC Converter Control for Peak-Shaving in Shipboard DC Power System via Hybrid Control**
Daeseong Park, Mehdi Karbalaye Zadeh and Roger Skjetne

P1175 **Accurate Reactive Power Sharing and Harmonic Mitigation in Islanded Microgrids Using Adaptive Virtual Capacitance**
Minh Duc Pham and Hong-Hee Lee

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P1204 **Simulation of Photovoltaic Absorption Strategy for Distribution Network Considering Translational Load**
Cheng Zhou

P1296 **Power-Based Phase-Locked Loops for Single-Phase Applications—A Survey**
Hao Qian, Jinming Xu and Shaojun Xie

P1394 **Risk Assessment of Static Voltage Stability Based on Power Electronic Load Uncertainty Modeling**
Siqing Xu, Deping Ke, Jian Xu, Yangzhou Pei and Ruitao Yan

P1403 **Research on UPS Filter Based on Passive Damping and Harmonic Trap**
Haichun Liu, Hong Cao and Shaojun Xie

P1518 **Research on Control Strategy of Photovoltaic Grid Connected Converter Under Voltage Distortion**
Chuncheng-Han, Zhenyu-Shi, Huan-He, Junde-Liu and Yang-Cao

P1061 **Analysis of Id-Iq Strategy for Active Power Filter**
Khan Shahnewaz Sohagh, Lei Wang, Xiaoqing Han, Wenping Qin, Dongxia Zhang and Runquan Meng

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P1433 **Analysis of Energy Feed System of Metro under Adaptive Moment of Inertia VSG Control**
Yang Zhou, Songrong Wu, Jiaxin Wei and Qian Kong

P1322 **A Cost-Effective Controlled-Type ZVS Technique for GaN-Based Totem-Pole PFC Rectifier**
Liu Yang, Xinyu Xu, Yihang Jia, Yue Liu, Yu Tai, Hongfei Wu and Yan Xing

P1265 **Controlled Three-Phase LCL- Filter PWM Rectifier with BESS-oriented Applications Under Unbalanced Grid Conditions**
Alberto Arellanes, Nancy Visairo-Cruz, Ciro Núñez and Dante Mora

P1325 **Microcontroller-Based Implementation of a Direct AC-AC SPWM Power Converter**
Hong Zhu and Xiaobo Pan

P1434 **A Resonant DAB DC-DC Converter Using Dual Transformers With Wide Voltage Gain And Variable Switching Frequency**
Deshang Sha, Hongliang Zhong and Debin Zhang

P1456 **Multi Objective Optimal Control Method for T-Type Three-Level Inverter Based on Model Prediction**
Hong Zhu, Xing Zhang, Ming Li, Xiaoxi Liu and Liusheng Zhang

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P1471 **ANPC Three-level Model Predictive Control Strategy Without Weight Factor**
Youguang Li, Cungang Hu and Yue Sun

P1476 **A Novel Single-Phase Nine-Level Converter and Its Control Strategy**
Sun Yue, Hu Cungang and Zhang Yunlei

P1541 **A Power Line Communication Method for SRG with Modified C-Dump Power Converter**
Y. C. Hua, D. S. Yu, Z. Yan and Y. H. Hu

P1563 **Performance Evaluation of LC-L Resonant Converter with Integrated Magnetics**
Yu Tai, Yue Liu, Jun Zou, Yihang Jia, Hongfei Wu and Yan Xing

P1009 **A New Wideband Modeling Method of Converter Transformer**
Yuanyuan Lei, Jie Zhou, Jiazhu Xu, Linjie Zhao and Qingmin Xin

P1160 **An Improved Human-Simulated Intelligent Control Algorithm for Bidirectional DC-DC Converter**
Shanlu Zhang and Lei Li

Session: TT23 **Power Electronics (VI)**

P1249 **Small-Signal Modeling of CLLC Bidirectional Resonant Converters**
Xin Zhang, Lei Li and Chengzhi Wan

P1251 **Analysis and Optimization of Single-Phase T-Type BCM Microinverter**
Chengzhi Wan, Lei Li and Jinchuan Zhang

P1268 **Hybrid Modulation Interleaving Scheme for CRM Totem-Pole Bridgeless PFC Rectifier**
Jinchuan Zhang, Lei Li and Xin Zhang

P1333 **A Step-Up Switched Capacitor Multilevel Inverter with Reduced Switches Tolerating Lower Stress**
Yunfei Zhang and Lei Li

P1509 **A Virtual Resistor Control Scheme for Boost Converter**
Cheng Jin, Jianhua Wang, Guoqing He and Jianfeng Zhao

P1281 **Optimization Design of Doubly Salient Electro-Magnetic Motor under Fault-Tolerant Operation of Excitation Fault**
Fuming Deng, XiaoLi Meng, LiangPeng Xu and ZiSen Liu

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P1042 **High-Frequency Signal Injection using Extend State Observer for Position Sensorless PMSM Drives**
Yuxin Li, Gaolin Wang, Wen Shen, Guoqiang Zhang, Nannan Zhao, Xintian He and Dianguo Xu

P1053 **Fundamental PWM Excitation Based Low-Speed Sensorless Control Method for PMSM Drives**
Hongpeng Zhang, Guoqiang Zhang, Wen Shen, Gaolin Wang and Dianguo Xu

P1205 **Economic Optimization Model of Islanded Microgrid Considering the Benefit of Energy Storage Charge and Discharge**
Cheng Zhou and Changbao Zheng

P1282 **A Distributed Scheme for Economic Optimization Operation and Voltage Recovery with Constant Power Loads(CPLs) in DC Microgrids**
Beibei Liu, Jian Yang, Wendong Feng, Ya Li, Lingqi Fang and Quanxu Lv

P1422 **New Design and Implementation of Power Distribution Network Management System**
Jian Wang, Yunlong Wang, Bin Lang, Yajun Liu, Yi Zhang and Qiuting Guo

P1111 **Improved Delay-Based Phase-Locked Loop for Grid-Tied Inverter to Improve the Performance under Weak Grid**
Jinming Xu, Hao Qian, Shenyiyang Bian and Shaojun Xie

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P1496 **Small-Signal Modeling and Comparative Analysis of Self Synchronous Droop Controlled Inverters in Microgrid System**
Fang Liu, Shiquan Liu, Meng Wang, Zhe Zhang and Haodong Wang

P1511 **A Method for Calculating the Impedance of Threephase Transformer in Photovoltaic Power Station Based on Power Loss**
Fei Li, Yongxin Zhang, Yang Liu, Yichao Tian, Xing Zhang and Mingyao Ma

P1208 **Performance Analysis and Comparison of Two Kinds of Double-Layer Permanent Magnet Synchronous Motors**
Xin Chen, Guoli Li, Zhe Qian, Qunjing Wang, Jian Zhou and Yi Cheng

P1414 **Research on Impact of Distributed Photovoltaic Grid Connection on Three-section Current Protection Strategy of Distribution Network**
Xiaochen Ma, Yunhua Li and Liman Yang

P1615 **A Two-stage Model Predictive Control Strategy for Economical Operation of Microgrid**
Jialin Yu, Hai Jin, Yanqun Zhang, Chuang Liu and Longhai Xiao

P1192 **Stiction Fault in MEMS Comb Drive Resonator**
Bhushan Dharmadhikari, Sarosh H Patel and Tarek Sobh

P1244 **Research for Micro Energy Pulse Power Supply Used by Combination Electro-discharge Machining**
Guangmin Liu, Yongbin Zhang, Lin Zhang, Jianyuan Li, Qi Jing, Bo Hu and Weiran Yuan

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P1588 **Simulation Based Method to Characterize Parasitic Parameters in a Double Pulse Test System**
Jianzhen Qu, Xue Yuan, Qianfan Zhang and Shumei Cui

P1583 **Voltage Control of Bipolar DC Distribution Systems Considering the Characteristics of Constant Power Load: A Load-Side Solution**
Jianquan Liao, Niancheng Zhou and Qianggang Wang

P1051 **Suppressing Output Fluctuation of Dynamic Wireless Charging System by Dual-Loop Control of Receiver-Side Boost Converter**
Shuangcheng Song, Zhihao He, Xi Zhang and Qianfan Zhang

P1291 **Modeling and Stablility Analysis of Peak-Current-Mode-Controlled SIDO CCM Buck Converter**
Yao Wang, Limei Xu, Liuyang Zhang and Ling Chen

P1238 **Fault-Tolerant Control and Its Transit Process for Three-Level NPC Inverter Fed Induction Motor System**
Qingli Deng and Xingli Ge

P1304 **Optical Method Based Detection and Wavelets Based Processing of Acoustic Waves**
Ajit Jha and Santiago Royo

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P1057 **Construction of Accurate Three-dimensional Cell Morphology Models from Confocal Images by Correcting Refractive Index Mismatch**
Zewen Yang, Lu zhang, Ning Lv, Shuang Chen, Zhiyuan Tang, Huijun Wang, Lele Luo and Li Yuan

P1598 **Dynamic Regret Analysis for Online Tracking of Time-varying Structural Equation Model Topologies**
Bakht Zaman, Luis Miguel Lopez Ramos and Baltasar Beferull-Lozano

P1469 **Multi-Scale Ship Tracking Based On Maritime Monitoring Platform**
Huanian Liao, Wei Wang, Shiqin Wang and Xin Xu

P1470 **A Novel Method based on Character Segmentation for Slant Chinese Screen-render Text Detection and Recognition**
Tianlun Zheng, Xiaofeng Wang, Xin Yuan and Shiqin Wang

P1146 **Sleeper Defect Detection Based on Improved YOLO V3 Algorithm**
Yingjie Zheng, Songrong Wu, Dong Liu, Ruoyu Wei, Shuting Li and Zhenwei Tu

P1151 **Detection Method of Track Locating Point Based on Yolo V3**
Ruoyu Wei, Songrong Wu, Dong Liu, Yingjie Zheng, Shuting Li and Rui Xu

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P1292 **GPU-Based Occlusion Minimisation for Optimal Placement of Multiple 3D Cameras**
Joacim Dybedal and Geir Hovland

P1058 **High Precision Phase Recovery for Single Frame Fringe Pattern of Label-free Cells Detection Based on Deep Learning**
Lu Zhang, Zhiyuan Tang, He Yang, Zewen Yang, Shuang Chen, Ning Lv, Huijun Wang, Xiaorong Shen, Yingzhe Tu and Li Yuan

P1056 **A Dual-Channel Design in Microfluidic Chip for Label-Free Detection by Quasi-Bessel Beam**
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P1098 **Study on Soft Sensing Technology of Penicillin Fermentation Based on PLS and SVR**
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P1097 **GNSS Receiver Satellite Selection Algorithm Based on Particle Swarm Optimization**
Ershen Wang, Caimiao Sun, Jing Guo, Pingping Qu, Tao Pang and Jiantong zhang

P1223 **A Detection Model for Anomaly on ADS-B Data**
Ershen Wang, Yuanshang Song, Song Xu, Jing Guo, Pingping Qu and Tao Pang

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P1022 **Damage Identification of a Jacket Support Structure for Offshore Wind Turbines**
Zhiyu Jiang, Wenbin Dong, Marius Bjørnholm, Zhengru Ren, Jiamin Guo and Amrit Shankar Verma

P1437 **System Identification of Static Nonlinear Elements: A Unified Approach of Active Learning, Over-Fit Avoidance, and Model Structure Determination**
Nalika Ulapane, Karthick Thiyagarajan and Sarath Kodagoda

P1621 **Safety Distance of Facilities and Personnel in Shale Gas Production Wellsite**
Hong Liu, Bolong He, Baizhong Hu, Ye Zhang, Xiaobin Xiong, Zujie Bie, Yichen Zhang and Xueyan Zhang

P1029 **Signal Processing Techniques for Nonlinear Identification of Structures Using Transient Response**
Joseph E. Dinardo, Z.C. Feng and P. Frank Pai

P1370 **Development of Portable Balance Rate Tester for Sucker Rod Pumping Unit**
Li Haoguang and PanYan

P1439 **Radar Emitter Signal Sorting Method Based on Density Clustering Algorithm of Signal Aliasing Degree Judgment**
Zhibin Yu, Yuxin Wang and Chenxia Chen

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P1630 **Detection of Major Depressive Disorder using Signal Processing and Machine Learning Approaches**
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P1542 **Image Reconstruction using RAPID Algorithm with Time-Frequency Analysis**
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P1553 **Denoising Method for Ultrasonic Flaw Echo Based on EMD and Local Entropy**
Hangrui Zhou, Jian Sun and Cunjian Miao

P1562 **Research on Vehicle Logistics Terminal Design**
Chujian Guo, Wei Li and Jingliang Zhang

P1364 **Design and Implementation of the Anti-Noise High Precision Voltage/Current Data Acquisition System**
Chunling Yang, Shifeng Zheng and Rongwei Feng

P1119 **Global Optimization based on Mixed H 2 and H ∞ Approach for Placement of Piezoelectric Actuators and Sensors on Curved Surfaces in Actively Controlled Structures**
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P1167 **Novel Fault-Tolerant Routing Technique for ZMesh Topology based Network-on-Chip Design**
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P1297 **Research on Visual Performance Evaluation Model of E-commerce Websites**
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P1054 **A Comparative Study of Energy-Aware Routing of Wireless IoT for Intelligent Gas Metering**
Pinggang Duan, Xiaohui Li, Yuemin Ding and Zhenxing Liu

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P1575 **Channel-Wise Part-Based Weighting Aggregation for Image Retrieval**
Qin Zhang, Wangming Xu and Shiqian Wu

P1186 **Improving Black Box Classification Model Veracity for Electronics Anomaly Detection**
Ana Elsa Hinojosa Herrera, Chris Walshaw and Chris Bailey

P1228 **Detecting and Tracing Multi-Strategic Agents with Opponent Modelling and Bayesian Policy Reuse**
Hao Chen, Jian Huang, Quan Liu, Chang Wang and Hanqiang Deng

P1634 **A Cognitive Analytics based Approach for Machine Health Monitoring, Anomaly Detection, and Predictive Maintenance**
Farzam Farbiz, Yuan Miaolong and Zhou Yu

P1532 **Indoor Space Classification Using Cascaded LSTM**
Rohan Kumar Yadav, Bimal Bhattarai, Lei Jiao, Morten Goodwin and Ole-Christoffer Granmo

P1629 **Deep Learning Based Binary Classification for Alzheimer's Disease Detection using Brain MRI Images**
Emtiaz Hussain, Mahmudul Hasan, Syed Zafrul Hassan, Tanzina Hassan Azmi, Md Anisur Rahman and Mohammad Zavid Parvez

P1198 **Grapheme to Phoneme Conversion of Norwegian using Hidden Markov Models**
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JiaLu Du, ZhiGuang Wang and Qiang Zhou

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P1182 **Acoustic Source Localization for Anti-UAV Based on Machine Learning in Wireless Sensor Networks**
Hansen Liu, Kuangang Fan and Bing He

P1211 **Distant Supervision Relation Extraction Model Based on Feature-recalibration Networks**
Tianji Chang, Qingmin Liang, Wu Yang and Yue Wang

P1582 **Hyper-Parameter Initialization for Squared Exponential Kernel-based Gaussian Process Regression**
Nalika Ulapane, Karthick Thiyagarajan and Sarath Kodagoda

P1213 **CFCSS : Based on CF Network Convolutional Seq2Seq Model for Abstractive Summarization**
Qingmin Liang, Tianji Chang, Ling Lu and Wu Yang

P1264 **Automatic Solving of Stabilization System Synthesis Problem by the Network Operator Method**
Askhat Diveev and Oubai Hussein

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P1303 **Autonomous Mooring towards Autonomous Maritime Navigation and Offshore Operations**
Ajit Jha, Dipendra Subedi, Per-Ove Løvsland, Ilya Tyapin, Linga Reddy Cenkeramaddi, Baltasar Lozano and Geir Hovland

P1490 **Camera-LiDAR Data Fusion for Autonomous Mooring Operation**
Dipendra Subedi, Ajit Jha, Ilya Tyapin and Geir Hovland

P1499 **A Survey on Sensors for Autonomous Systems**
Linga Reddy Cenkeramaddi, Jyoti Bhatia, Ajit Jha, Santosh Kumar Vishkarma, Soumya J.

P1131 **Research on Calculation Method of Line Loss in Distributed Transformer Area Considering Uncertainty of Distributed Photovoltaic Output**
Rujia Qiu, Bo Gao, Lizhu Pan, Zhengkai Zhang, Wei Pan, Nan Zhang and Pingping Han

P1132 **Design and Application of a Photovoltaic-Energy Storage Joint System with Active Frequency Regulation Capability**
Jinhui Ma, Haifeng Ye, Zhi Li, Pinpin Han and Xi Wang

P1559 **Mechanism Analysis of Power Grid Cascading Failures Based on Data Mining Algorithm**
Chunlan Deng, Yao Xiao, Qianlong Zhu and Yi Guo

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P1294 **A Novel Adaptive Stabilization Strategy for Autonomous DC Microgrids**
Xiaoyu Wang, Chuanlin Zhang and Nannan Jiang

P1321 **Optimal Modeling of Integrated Energy Demand Response under Time-Shared Electricity Price**
Jingsong Zhou, Chang Wang, Xiulin Xiao, Dan Zhou, Yinlong Fan and Lei Wang

P1327 **An Optimal Allocation Method for Multi-Agent Joint Capacity of Microgrid**
Boliang Lou, Hongyang Huang, Junchao Ma, Dan Zhou and Yan Peng

P1328 **Control Strategy for Fast Frequency Modulation of Regional Power Grid with Energy Storage System**
Xiaozhong Wang, Chengqian Lin, Chengliang Shen, Wen Gan, Fan Li, Jihua Huang, Wei Tong and Lei Wang

P1379 **Distributed Nonconvex Economic Dispatch Algorithm for Large-Scale Power System**
Bowen Xu, Fanghong Guo, Wen-An Zhang, Jiawei Chen and Changyun Wen

P1314 **Lyapunov Based Current Control Scheme for Grid-Connected Inverter**
Wei Zhang and Hongpeng Liu

Session: SS03 **Invited Session on Power Converters for Energy Router: Topologies, Advanced Control Strategies and Applications**

P1329 **Power Flow Analysis of Three-Port Resonant DC Transformer And Discussion on Phase Shift Control**
Yongtao Yuan, Xiangqian Tong, Jingjing Huang, Wei Zhang, Jianfang Xiao and Leong Hai Koh

P1330 **I&I Adaptive Based Backstepping Passive Coordination Control of STATCOM and Generator Excitation**
Chaofan Du, Lei Zhang, Jiahao Zhu and Xingpeng Bo

P1332 **High-efficiency Oriented Control Method of Bidirectional CLLC Resonant DC/DC Converter for Energy Storage System**
Geng Li, Jingjing Huang, Wei Zhang, Xiangqian Tong, Jianfang Xiao and Marcus Koh Leong Hai

P1407 **Event-Triggered Model Predictive Control for A Three-Phase Inverter with Output *LC* Filter**
Benfei Wang, Jingjing Huang, Jose Rodriguez, Cristian Garcia and Guodong Feng

P1449 **A Model Predictive Control for Event-Triggered Three-Phase Vienna Rectifiers**
Zhou Yunhong, Zhang Aimin, Zhang Hang, Zhang Wei, Huang Jingjing, Du Yudong and Zhang Lei

P1523 **Design and Implementation of Charging Pile in a Router-type DC Charging Station**
Yudong Du, Zhang Aimin, Hang Zhang, Zhang Wei, Jingjing Huang, Yunhong Zhou, Zhang Lei and Yang Yu

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P1125 **Adaptive Control of a Voltage-Controlled Magnetic Levitation System with K-filter**
Zhengqiang Zhang and Zhenwei Ma

P1135 **Fault Detection, Isolation and Estimation for Linear Systems with Partial Disturbance Decoupling**
Zhao Zhang, Muheng Wei and Xiao He

P1147 **Adaptive Fuzzy Finite-time Control for Switched Nonlinear Inverted Pendulum Systems**
Yanli Fan, Tingting Yang and Yongming Li

P1177 **Self-Triggered Control for Nonlinear Systems: A New Design Scenario From the Control Signal Perspective**
Lantao Xing, Changyun Wen, Yu-Chu Tian and Yang Yang

P1240 **Terminal Sliding Mode Control for Spatial Descent of a Stratospheric Airship**
Yifei Zhang, Ming Zhu, Tian Chen and Zewei Zheng

Session: SS05 **Invited Session on Advanced Control Methodologies for Uncertain Dynamical Systems with Industrial Applications (II)**

P1286 **Event-Based Formation Control for Linear Multi-Agent Systems Under Switching Topology**
Guoliang Zhu, Kexin Liu, Haibo Gu and JinHu Lii

P1289 **Event-triggered Adaptive Output Consensus Tracking Control of Uncertain Nonlinear Multi-agent Systems**
Jiang Long, Wei Wang, Jangshuai Huang and Lei Wang

P1552 **Adaptive Leaderless Consensus for a Class of Uncertain Nonlinear Systems with Intermittent Actuator Faults**
Marwah Saad Mahdi AL-Adhami, Jiang Long, Wei Wang and Lei Wang

P1620 **Event-Triggered Adaptive Control for a Class of Nonlinear Systems with Unknown Time-Varying Parameters**
Wenxiu Zhuang, Jing Zhou, Zhitao Liu and Hongye Su

P1275 **Distributed Adaptive Cooperative Control for a Class of Nonlinear Multi-Agent Systems with Input Saturation**
Ming Xiao, Zhitao Liu and Hongye Su

Session: SS06 **Invited Session on Advanced Control and Topology for Railway Traction Drive System**

P1128 **Robustness Improvement of Deadbeat Model Predictive Control for Five-phase PMSM Drives**
Mahmoud S. R. Saeed, Wensheng Song and Bin Yu

P1130 **Improved Imaginary Axis Current Estimation for Single-phase Voltage Source Converters**
Peng Lin, Ma Lei, Song Wensheng and Liu Haoran

P1136 **Model Predict Torque Control of Induction Motor Based on the DTC Switching Table**
Chaoqun Xiang, Xinan Zhang, Zhuoxin Li, Lulin Zhang and Shu Cheng

P1194 **A Method of the Locomotive Speed Estimation Based on Fuzzy Logic and Extended Kalman Filter**
Wenqi Deng, Jingchun Huang and Qinghua Zhang

P1252 **Direct Instantaneous Torque Control of Switched Reluctance Motor Using Adaptive Excitation Angle**
Yue Chen, Qilong Jiang, Lili Zhai, Fen Liang and Weifeng Yao

P1254 **Study on Direct Thrust Control of Six-Phase PMSLM Based on Independent H-Bridge Inverters**
Lili Zhai, Qilong Jiang, Yue Chen, Fen Liang and Weifeng Yao

P1608 **Pre-Synchronization Control of Grid-Connected Three-Phase Inverters Based On the Characteristics of Synchronous Generators**
Shiqiang Xiang, Shuting Li, Songrong Wu and Zizhan Li

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P1231 **Synthesis and Analysis of Power Management Units for IoT Applications**
Xi Chen, Ping Yang and Yusheng Peng

P1250 **Open-Circuit Fault Diagnosis in Shunt Active Power Filters with No Additional Sensors**
Yujia Liu, Pengcheng han, Xiaoqiong He, Zeliang Shu and Shibin Gao

P1258 **A DC-link Oscillation Suppression Strategy in Metro Traction Drive System Based on Virtural Damping Resitor**
Weixin Sun, Xinglai Ge and Xiao Hu

P1383 **Formal description and verification of vehicle-to-ground communication protocol for guided transport control system**
Haibo Zhao, Yuan Cao and Jiakun Wen

P1455 **IGBT Open-Circuit Fault Diagnosis of Single-Phase Cascade NPC Rectifiers Based on Residual Rate**
Mingbo Jin and Xinglai Ge

Session: SS08 **Special Session on Smart manufacturing System and Data Analytics**

P1065 **Machine OEE Monitoring and Analysis for a Complex Manufacturing Environment**
Junhong Zhou, Yu Wang and Yong Quan Chua

P1369 **MVmed: Fast Multi-Object Tracking in the Compressed Domain**
Lukas Bommes, Xinlin Lin and Junhong Zhou

P1506 **Smart Pegging and Release Control for Multi-product Production Testbed with Shopfloor Visibility**
Jing Zhuang, Jihoon Hong and Junhong Zhou

P1534 **Unsupervised Probability Matching for Quality Estimation with Partial Information in a Multiple-Instances, Single-Output Scenario**
Kee Jin Lee, Edward Kien Yee Yapp and Xiang Li

P1423 **FM-based Supervised Learning for Categorical Data Classification in Manufacturing Process**
Jianlin Yu, Xiang Li, Wen Feng Lu and Yajuan Sun

Session: SS09 **Special Session on Advanced Mechatronics in Offshore Systems**

P1164 **Incorporation of Ship Motion Prediction into Active Heave Compensation for Offshore Crane Operation**
Yingguang Chu, Guoyuan Li and Houxiang Zhang

P1312 **Semi-automatic Approach to Create Fish Image Datasets for Aquaculture Applications**
Alberto Maximiliano Crescitelli, Lars Christian Gansel and Houxiang Zhang

P1343 **Development of Onboard Decision Supporting System for Ship Docking Operations**
Luman Zhao, Guoyuan Li, Knut Remøy, Baiheng Wu and Houxiang Zhang

P1399 **Modeling of Offshore Crane and Marine Craft in Wave Motion**
Ronny Landsverk, Jing Zhou, Geir Hovland and Houxiang Zhang

P1480 **A Human-Expertise Based Statistical Method for Analysis of Log Data from a Commuter Ferry**
Baiheng Wu, Guoyuan Li, Luman Zhao, Hans Petter Hildre and Houxiang Zhang

P1551 **Broad Learning System-Based Adaptive Optimal Course-Keeping Control of Marine Surface Vessel**
Yuzhuo Ma, Tieshan Li, C. L. Philip Chen and Liang'en Yuan

P1581 **GPU-Based Optimisation of 3D Sensor Placement Considering Redundancy, Range and Field of View**
Joacim Dybedale and Geir Hovland

Session: SS10 **Invited Session on Advanced techniques towards more electrified and intelligent mobility**

P1530 **Lithium-Ion Battery Parameter Identification and State of Charge Estimation based on Equivalent Circuit Model**
Jiang Chang, Zhongbao Wei and Hongwen He

P1555 **Learning based Predictive Error Estimation and Compensator Design for Autonomous Vehicle Path Tracking**
Chaoyang Jiang, Hanqing Tian, Jibin Hu, Jiankun Zhai, Chao Wei and Jun Ni

P1557 **Path Planning Method Design and Dynamic Model Simplification of Free-Flying Space Robot**
Zhuoyi Xing, Yang Zhao and Shunjie Zhu

P1564 **Control Strategy of Lunar Lander-Relay Satellite Antenna Acquisition and Tracking for Chang'e-4 Lunar Exploration Mission**
Yang Zhao, Ting Zhang, Xueying Wu and He Zhang

P1580 **Multi-Layer Scheduling Optimization for Intelligent Mobility of Maritime Operation**
Deqing Zhai, Xiuju Fu, Hai-Yan Xu, Xiao Feng Yin, Jayaraman Vasundhara and Wanbing Zhang

P1587 **Robust Energy Management for Uncertain Microgrid Using Modified Grey Wolf Optimizer**
Yuhao Cao, Tengpeng Chen, Lu Sun, Yuhao Sun, Zhongbao Wei and Gehan A. J. Amaratunga

Session: SS11 **Invited Session on Modelling and Control of Robots**

P1375 **Self-Calibration of Wearable Upper Limb Cabledriven Exoskeleton**
Yuhan Ji, Weihai Chen, Jianbin Zhang, Zaojun Fang and Wenjie Chen

P1376 **Experimental Implementation of Collective Motion based on Swarm Robotic Control**
Yating Zheng and Zhangang Han

P1386 **Comprehensive Characterization Method of Faulttolerant Kinematics Ability for Space Manipulator with Joint Locked Failure**
Lanpu Li, Gang Chen, Yifan Wang and Yingzhuo Fu

P1411 **Design of an Underactuated Body Fixture for a 7-DOF Cable-Driven Upper Limb Exoskeleton**
Jianbin Zhang, Chenyang Xu, Zaojun Fang, Xiantao Sun and Weihai Chen

P1450 **Variable Structure Compensation PID Control for Lower Extremity Exoskeleton**
Qiying Su, Zhongcai Pei, Zhiyong Tang and Hengyu Xie

P1607 **Adaptive Locomotion of Lower Limb Exoskeleton Based on Oscillators and Frequency Adaptation**
Wen duan, Weihai Chen, Jianhua Wang, Jianbin Zhang, Weidong Chen and Zheng Zhao

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P1454 **An Initial Study to Use Deep Reinforcement Algorithm to Improve Efficiency of Emergency Response**
Ping Wang, Longhao Yan, Jingwei Liu, Jun Wang and Yinli Jin

P1461 **Autocorrelation Convolution Networks Based on Deep Learning for Automatic Modulation Classification**
Duona Zhang, Wenrui Ding, Hongyu Wang and Baochang Zhang

P1462 **Deep Convolutional Neural Network with Wavelet Decomposition for Automatic Modulation Classification**
Hongyu Wang, Wenrui Ding, Duona Zhang and Baochang Zhang

P1507 **3D Semantic Segmentation Algorithm for Indoor Scenes based on Long-term Memory**
Ziyang Liu, Weihai Chen, Jianhua Wang, Xingming Wu, Haosong Yue, Zongju Peng and Zhengguo Li

P1514 **Design of Embedded Target Tracking System Based on MobileNet and KCF**
Chunling Yang, Zhenwei Chen, Yan Zhang and Yuze Li

P1519 **An Adaptive Gradient Method with Differentiation Element in Deep Neural Networks**
Runqi Wang, Wei Wang, Teli Ma and Baochang Zhang

P1550 **Dim Target Track-Before-Detect based on Particle Filtering**
Guoliang Zhang, Lin Ma, Jianjun Ge, De Zhang, Guanghong Liu and Fangpei Zhang

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P1345 **Edge Enhancement in Monocular Depth Prediction**
Haosong Yue, Jinqing Zhang, Xingming Wu, Jianhua Wang and Weihai Chen

P1346 **Dynamic Modeling and Control Methods of a Novel Electromagnetic-Driven Spherical Motion Generator**
Lu Liu, Xiao Song, Jingmeng Liu, Weihai Chen and Guilin Yang

P1359 **Integration of Data Distribution Service into Partitioned Real-time Embedded Systems**
Boyang Song, Xiaoguang Hu, Jin Xiao, Guofeng Zhang, Shuo Wang and Qing Zhou

P1361 **Mechanical Design and Optimization on Lower Extremity Rehabilitation Robot**
Yang Li, Weihai Chen, Jianhua Wang, Jianbin Zhang and Xiantao Sun

P1362 **Virtual Test Modeling Method of Environment Control System in Aircraft**
Wang Jian and Li Yun-Hua

P1387 **The Technology of Bus Network Communication for Space Environment**
Shuiqiang Pei, Dongying Ma, Xiaoguang Hu Hui Wang and Zhengtian Li

P1415 **Research on PCIe Bus Communication Based on NeoKylin**
Linsong Gu, Li Li, Xiaoguang Hu, Jin Xiao and Lei Liu

Session: SS14 Special Poster Session (II)

P1436 **Multi-Agent Cluster Systems Formation Control with Obstacle Avoidance**
Yi Sun, Xiaoguang Hu, Jin Xiao, Guofeng Zhang, Shaojie Wang and Lei Liu

P1457 **A Robust SLAM towards Dynamic Scenes Involving Non-rigid Objects**
Xingming Wu, Lingkun Kong, Haosong Yue, Jianhua Wang, Fanghong Guo and Weihai Chen

P1484 **Research on Reconfigurable Technology and a Design of Application**
Zhengtian Li, Boyang Zhao, Xiaoguang Hu, Yujiao Wang, Peng Cheng and Shuiqiang Pei

P1510 **Simulation Technique of Optical Properties and its Applications for Complicated Appearance of Aeronautical Transparencies**
Bo Yang, Chuan Chen, Shenling Zhou and Yunhua Li

P1570 **Visual Heart Rate Estimation from Facial Video Based on CNN**
Bin Huang, Che-Min Chang, Chun-Liang Lin, Weihai Chen, Chia-Feng Juang and Xingming Wu

P1585 **Learning-based Remote Photoplethysmography for Physiological Signal Feedback Control in Fitness Training**
Che-Ming Chang, Chun-Chen Hung, Changchen Zhao, Chun-Liang Lin and Bo-Yuan Hsu

P1627 **Dynamic Analysis and Controller Design for the Ballbot**
Zhuang He, Liang Yan, Xiaoshan Gao and Chris Gerada

Session: SS15 **Special Poster Session (III)**

P1347 **Anthropomorphic Flexible Joint Design and Simulation**
Zhuoyuan Chen, Shaoping Wang, Chao Zhang, Pengyu Zhang and Zirui Liao

P1355 **Vehicle Trajectory Recognition based on Video Object Detection**
Saisai Wang, Ping Wang, Jun Wang and Yinli Jin

P1366 **Motion Characteristic and Analysis of Bionic Jellyfish with Fluid-Driven Soft Actuator**
Pengyu Zhang, Chao Zhang, Shaoping Wang and Zhuoyuan Chen

P1367 **Control for Networked Control Systems with Multiple Controllers**
Na Wang, Lei Xu, Xiao Lu, Haixia Wang, Xiao Liang and Qiyan Zhang

P1373 **Research on Modeling and Planning Method of Distribution Network with New Energy and Special Load**
Wei Luo and Qiantao Huo

P1397 **Cloud-based Test Modeling and Automatic Generation of Test Cases**
Jing Dai, Haoran Wang, Yue Ni, Haiyan Li and Shuo Shi

P1412 **Research on High Precision Positioning Servo Control of PMSM**
Min Zhu, Zhilong Bai, Ao Liu, Chunling Yang and Chaoyong Guo

Session: SS16 **Special Poster Session (IV)**

P1424 **Research on the Performance Evaluation of Lithiumion Battery Cascade Utilization Based on Impedance Spectrum**
Chao Lyu, Gang Wei, Zhaoliang Wen, Hongying Zhang, Qi Wu and Haitao Jing

P1425 **Active Fault-Tolerant Control for Multi-agent System in Dynamic Tracking**
Qiwang Weng, Shaoping Wang and Jian Shi

P1428 **A Reduction Method for Thermal Modeling of Lithium-ion Battery based on Proper Orthogonal Decomposition**
Chao Lyu, Yi Sheng, Shuang Zhang, Shihuai Zhu, Yankong Song and Honghai Yu

P1429 **An Electrochemical Thermal Coupling Model for High Crate Conditions in Lithium-ion Batteries**
Chao Lyu, Yanben Zhao, Yitong Han, Qi Guo and Xinfeng Zhao

P1430 **Research on Low Temperature Internal AC Heating Device for Lithium-Ion Battery**
Chao Lyu, Baozhao Ma, Shenglai Yan, Weining Li and Haitao Jing

P1440 **Experiment Design: Intelligent Traffic Management System**
Haosong Yue, Huaiyi Mu, Haochen Liu and Yi Cai

P1451 **A Half-bridge Strategy Based Fault-tolerant Control for BLDCM under Open Circuit Fault**
Shuai Wang, Xinhua Zhang, Guansong Xiong, Jun Wang, Zijun Zhang and Xingjian Wang

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P1466 **RUL Prediction of Lithium Batteries based on DLUKF Algorithm**
Ting Tang, Hui-Mei Yuan and Jun Zhu

P1486 **Mining Diagnostic Knowledge from Spacecraft Data Based on Spark Cluster**
Haoran Wang, Jinsong Yu, Diyin Tang, Danyang Han, Limei Tian and Jing Dai

P1493 **A Hierarchical Testability Analysis Method for Reusable Liquid Rocket Engines Based on Multi-Signal Flow Model**
Yao Wu, Jinsong Yu, Diyin Tang, Limei Tian, Zhanbao Gao and Jing Dai

P1503 **6LoWPAN Protocol Based Infrared Sensor Network Human Target Locating System**
Bo Yang, Fuhuang Liu, Lulu Yuan and Yukexin Zhang

P1528 **Research on Target 3D Reconstruction and Measurement Technology based on Binocular Vision and Lidar**
Yue Ni, Jing Dai, Yaolei Zhang, Yidong Chen and Xiaoyu Ma

P1558 **Research on a Servo Control System for Flow Regulation**
Wang Aping, Xu Haobang, Li Huaibing and Liu peng

P1616 **Optimal Dispatching Model of Active Distribution Network Considering Uncertainty of Demand Response**
Longhai Xiao, Xiangbing Lei, Qi Chen, Huaguo Tang and Jialin Yu

Session: SS18 **Invited Session on Advanced control technologies for robotic system and its applications**

P1037 **Disturbance Observer Based Robust Adaptive Control of Maglev System**
Jiaqi Liu, Xiangbin Liu and Kangjun Wang

P1123 **Stiffness Estimation and Intention Detection for Human-Robot Collaboration**
Xiongjun Chen, Yiming Jiang and Chenguang Yang

P1137 **Online Parameter Estimation For Uncertain Robot Manipulators With Fixed-time Convergence**
Chengzhi Zhu, Yiming Jiang and Chenguang Yang

P1212 **Trajectory Tracking Control of Robotic Manipulators by Multi-layer Neural Networks**
Ganggang Zhong, Yanan Li and Jiangang Li

P1225 **Global Fast Terminal Sliding Mode Control for a Quadrotor UAV**
Yurong Li, Yi Qin, Fujie Wang, Fang Guo and John T. W. Yeow

Session: SS19 **Invited Session on System Design and Test**

P1363 **A Novel Intelligence-Based Pan-Tilt Platform System for Measuring the Trajectories of Parachute**
Zhiyong Tang, Jianbing Yang, Zhongcai Pei and Xiao Song

P1371 **Design and Research of an Automatic Charging System for Electric Vehicles**
Wei Luo and Lu Shen

P1398 **Research on Payload Distribution of UAV Formation with Constraints**
Jin Xiao, Zhiwei Zhu, Xiaoguang Hu, Guofeng Zhang and Lei Liu

P1419 **A New Framework and Implementation Technology of Deep Collaborative Front-End Computing**
Linna Wang, Yitong Xia, Cheng Wang and Baochang Zhang

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