

2023 IEEE 32nd International Symposium on Industrial Electronics (ISIE 2023)

**Helsinki, Finland
19-21 June 2023**

Pages 1-752



**IEEE Catalog Number: CFP23ISI-POD
ISBN: 979-8-3503-9972-1**

**Copyright © 2023 by the Institute of Electrical and Electronics Engineers, Inc.
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

***** *This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP23ISI-POD
ISBN (Print-On-Demand):	979-8-3503-9972-1
ISBN (Online):	979-8-3503-9971-4
ISSN:	2163-5137

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

TABLE OF CONTENTS

Analysis and Modeling of Switched-Capacitor Converters with Parasitic Inductance <i>Yuhang Yang, Dengke Zheng, Ranyu Yao, Yan Deng</i>	1
Artificial Neural Network Based Thermal Model for a Three-Phase Medium Frequency Transformer <i>David Molinero, Daniel Santamargarita, Emilio Bueno, Marta Marrón, Miroslav Vasic</i>	7
Three-Phase EV Charging System Based on Matrix Converters with Improved Current Commutation <i>Yuxin Liu, Wusen Wang, Rundong Huang, Senyi Liu, Hao Wen, Chunhua Liu</i>	13
A Novel Sensorless Control Method for Three-Phase Active Front End Rectifiers <i>Ali Sharida, Sertac Bayhan, Haitham Abu-Rub</i>	19
Fuzzy Inferred Impedance Matching for the SIMO-WPT Scheme <i>Jamie Yang, Chun-Liang Lin</i>	25
A Generic Lyapunov-Based Observer for Double-Star-Chopper-Cell/Bridge-Cell Modular-Multilevel-Cascade-Converters <i>Leonardo Testa, Oliver Kalmbach, Christoph M. Hackl</i>	29
Mitigation of Current Ringing Effects in a Dual Active Bridge Converter <i>Giuseppe Bossi, Mauro Boi, Andrea Floris, Alfonso Damiano</i>	35
Motion Control by Wireless Transmission of Power Packets: Experimental Verification with Multi-Finger Robot Hand <i>Takahiro Mamiya, Shiu Mochiyama, Takashi Hikihara</i>	41
Analysis and Mitigation of Low-Order-Harmonic Neutral-Point Voltage and Current Ripples in Five-Level NPC-Based Inverters <i>Almachius Kahwa, Hidemine Obara, Yasutaka Fujimoto</i>	47
Load-Independent Class E ⁻¹ Voltage-Driven Synchronous Rectifier <i>Shizuna Oshima, Hirotaka Koizumi</i>	52
Passive Damping Stabilization for Constant-Power Loaded Boost Converter <i>M. Sebastià-Rullo, A. Cid-Pastor, H. Valderrama-Blavi, A. El Aroudi, L. Martínez Salamero</i>	59
Combined Operation of CCM and DCM for an Active Buffer DAB AC-DC Converter <i>Kain Arai, Shohei Komeda, Shunsuke Takuma, Yoshiya Ohnuma</i>	65
A Low Passive Count Redundant Four-Level Inverter Topology <i>F. Vejar, M. Maerz</i>	71
Multifunctional Grid-Forming Cascade Control for Converters Equipped with an LCL Filter <i>Rayane Mourouvin, Tuure Nurminen, Marko Hinkkanen, Ville Pirsto, Jarno Kukkola</i>	81
A Novelty Proposal of Grid-Forming Multi-Cell DC-AC Converter for Single-Phase Railway Catenary Systems <i>Roberto Martín López, Alessandro Faro, Sergio De López Díz, Alessandro Lidozzi, Emilio J. Bueno Peña</i>	87

Hardware-In-The-Loop Modeling of Three-Phase T-Type Neutral Point Clamped Voltage Source Inverter for Battery Charging Stations	94
<i>Kristian Takacs, Michal Frivaldszky</i>	
Combining Virtual Synchronous Machine and Feedforward Torque Control for Doubly-Fed Induction Machine Based Wind Energy Conversion Systems.....	99
<i>Andre Thommessen, Christoph M. Hackl</i>	
Three-Level Four-Leg Voltage Source Inverter Modulation Techniques Comparison for Smart Grids.....	107
<i>Asier Davila, Iñaki Aizpuru, Estefanía Planas, Jose Antonio Cortajarena, Antoni Arias</i>	
On LinDistFlow Model Congestion Pricing: Bounding the Changes in Power Tariffs.....	113
<i>Shourya Bose, Kejun Chen, Yu Zhang</i>	
A Predictive Control Based Scheme for Maximum Power Extraction of PMSG Based Wind Turbine Systems	119
<i>Fahimeh Shiravani, Jose Antonio Cortajarena, Patxi Alkorta, Mikel Gonzalez Perez, Oscar Barambones</i>	
Reinforcement Learning Based Coordination of Virtual Inertia Provision from Inverter-Dominated Distribution Grids.....	125
<i>Simon Stock, Davood Babazadeh, Philipp Hund, Christian Becker</i>	
The Choice of Components for the Construction of a Power Inverter of 44 kW WPT System.....	131
<i>Jakub Skorvaga, Michal Frivaldszky</i>	
An Extension of the Kinetic Battery Model for Optimal Control Applications	137
<i>Masoomeh Karami, Sajad Shahsavari, Eero Immonen, Mohammad-Hashem Haghbayan, Juha Plosila</i>	
Design of a Thermal Battery Dummy with Integrated Sensor Node.....	143
<i>Michael Grubmüller, Bernhard Schweighofer, Hannes Wegleiter</i>	
Degradation Detection of Series-Connected Li-Ion Based ESS Via Time Domain Reflectometry.....	149
<i>Hyeong Min Lee, Yong-June Shin</i>	
Three-Dimensional Model of a Cylindrical Lithium-Ion Cell – Influence of Cell Design on State Imbalances and Fast-Charging Capability.....	155
<i>Alexander Fill, Mike Kopp, Jessica Hemmerling, Sabri Baazouzi, Luca Tendera, Kai Peter Birke</i>	
Online Object Tracking on Multiple Cameras with Completely Overlapping Views.....	163
<i>Jan-Philip Richter, Sebastian Flores, Oliver Urbann</i>	
Design and Characterization of an EOG Signal Acquisition System Based on the Programming of Saccadic Movement Routines	170
<i>Luis A. Frem-Sosa, Mónica Valenzuela-Delgado, Wendy Flores-Fuentes, Julio C. Rodríguez-Quiñonez, Oleg Sergiyenko, Daniel Hernández-Balbuena, Fabián N. Murrieta-Rico, Jesús E. Miranda-Vega, Paolo Mercorelli</i>	
Using Object Detection for a Robust Monocular SLAM in Dynamic Environments	175
<i>Youssef El Gaouti, Fouad Khenfri, Mehdi McHarek, Cherif Larouci</i>	

Numerical Algorithm for Processing Phase Images for Measuring Three-Dimensional Geometry of Dynamic Objects by Phase Triangulation Methods.....	181
<i>Sergey V. Dvoynishnikov, Vladimir A. Pavlov, Grigiry V. Bakakin, Dmitry V. Kulikov, Vladimir G. Meledin, Vitaly V. Rakhmanov</i>	
Application of Narrowband Optical Filtering of Doppler Signals in Aerodynamic Experiments	185
<i>Vitaly V. Rakhmanov, Sergey V. Dvoynishnikov, Grigiry V. Bakakin, Vladimir A. Pavlov</i>	
A Robust Self-Organizing UAV Swarm with Loss Compensation Strategies for Efficient Mission Execution.....	189
<i>Yang-Yi Chen, Chun-Liang Lin, Chian-Yu Lu, Chia-Hsuan Lai, Wen-Chun Huang, Syu-You Ciou</i>	
Autonomous Drone Swarm with Bionic Control	193
<i>Chia-Hsuan Lai, Chun-Liang Lin, Yang-Yi Chen, Wen-Chun Huang, Chian-Yu Lu, Syu-You Ciou</i>	
An Image Location System Based on SIFT Algorithm to Alternative to GPS	197
<i>Tzu-Ming Wang, Chun-Liang Lin</i>	
Fruit Detection and Classification Using Computer Vision and Machine Learning Techniques.....	201
<i>Victor Zárate, Ednita González, Danilo Cáceres-Hernández</i>	
An Efficient and Secure DAG-Based LoRaWAN System.....	207
<i>Yang Wei, Kim Fung Tsang, Hao Wang</i>	
Artificial Intelligence-Based Diagnosis of Hydraulic Centrifugal Pumps Using Vibration Sensor: Feature Extraction and Failure Classification.....	212
<i>Zahra Kazemi, Peter Rindom Andersen, Jakob Lemming, Peter Gorm Larsen</i>	
PestDSS: An Integrated Decision Support System for Sustainable Pest Management in Agriculture	218
<i>Zhipeng Yuan, Shunbao Li, Ruolin Peng, Daniel Leybourne, Po Yang, Yang Li</i>	
Temporal Bi-Index.....	224
<i>Michal Kvet</i>	
A Resilient Framework for 5G-Edge-Connected UAVs Based on Switching Edge-MPC and Onboard-PID Control	230
<i>Gerasimos Damigos, Achilleas Santi Seisa, Sumeet Gajanan Satpute, Tore Lindgren, George Nikolakopoulos</i>	
Compensating Delays for Precise and Real-Time ROS Cloud Robotics Localization.....	238
<i>Gábor Fehér, Dánial Agócs, Dánial Rózsa, Marcell Balogh, Norbert Reider</i>	
Discrete-Time Observers for a Mechatronics System with PID Controllers Tuned Using SMA	242
<i>Alexandra-Iulia Szedlak-Stinean, Radu-Emil Precup, Raul-Cristian Roman, Emil M. Petriu</i>	
Dynamic Path Planning in Human-Shared Environments for Low-Resource Mobile Agents	250
<i>Pangcheng David Cen Cheng, Marina Indri, Federico Maresca, Antonio Ragazzo, Fiorella Sibona</i>	
PI and Super Twisting Sliding Mode with Smith Predictor Control Structures for SMA Actuators	256
<i>Claudia-Adina Bojan-Dragos, Radu-Emil Precup, Raul-Cristian Roman, Emil M. Petriu, Mihai Munyan</i>	

Angle Control Using Corona Discharge Considering Voltage Range Limitations	263
<i>Shigeki Yashita, Hiroaki Katagiri, Tomoya Kitamura, Yuki Inada, Yutaka Kazoe, Takahiro Nozaki</i>	
MQLINK: A Scalable and Robust Communication Network for Autonomous Drone Swarms	269
<i>Wen-Chun Huang, Chun-Liang Lin, Yang-Yi Chen, Chia-Hsuan Lai, Chian-Yu Lu, Syu-You Ciou</i>	
Bag-Of-Functions Denoising: Extracting Main Components in Time Series.....	273
<i>Hendrik Klopries, Andreas Schwung</i>	
Age Group Recognizer Based on Human Face Supporting Smart Digital Advertising Platforms	279
<i>Adri Priadana, Muhamad Dwisnanto Putro, Duy-Linh Nguyen, Xuan-Thuy Vo, Kang-Hyun Jo</i>	
A Noninvasive Smart Chair System for Monitoring Postures in Sedentary Workers.....	286
<i>Luis Sigcha, Eduarda Pereira, Ana Lima, João Tiago Antunes, Diana Carvalhais, Diogo Sousa, Abdulay Abreu, Nelson Costa, Paulo Cardoso</i>	
Gaze Orientation to Evaluate Object Interaction in Human Functional Assessment.....	292
<i>Álvaro Nieva-Suárez, Marta Marrón-Romera, Cristina Losada-Gutierrez</i>	
Application of Reinforcement Learning for Energy Consumption Optimization of District Heating System	298
<i>Jifei Deng, Miro Eklund, Seppo Sierla, Jouni Savolainen, Hannu Niemistö, Tommi Karhela, Valeriy Vyatkin</i>	
A User-Extensible Solution for Deploying Fog Computing in Industrial Applications.....	304
<i>Pietro D'Agostino, Massimo Violante, Gianpaolo Macario</i>	
Reliability Estimation of Split DNN Models for Distributed Computing in IoT Systems	310
<i>Juan-David Guerrero-Balaguera, Ian A. Harshbarger, Josie E. Rodriguez Condia, Marco Levorato, Matteo Sonza Reorda</i>	
Developing a Test Suite for Evaluating IEC 61499 Application Portability.....	314
<i>Midhun Xavier, Tatiana Laikh, Sandeep Patil, Valeriy Vyatkin</i>	
Hardware Support for Static-Priority Stack Resource Policy Based Scheduling	318
<i>Per Lindgren, Paweł Dzialo, Henri Lunnikivi</i>	
Analysing Navigation Paths in Constrained Graphs Using Petri Nets	323
<i>Luis Gomes, José Ribeiro-Gomes</i>	
Supporting a .csv-Based Workflow in MongoDB for Data Analysts	327
<i>Matteo Fresta, Alessio Capello, Francesco Bellotti, Luca Lazzaroni, Marianna Cossu, Riccardo Berta</i>	
Evaluation of Isolation and Communication Mechanisms for Real-Time Containers	331
<i>Moritz Walker, Marc Fischer, Armin Lechler, Alexander Verl</i>	
A Real-Time Digital Twin Approach on Three-Phase Power Converters.....	339
<i>Sergio De López Díz, Roberto Martín López, Emilio José Bueno Peña, F. Javier Rodríguez Sánchez</i>	
Component Test – Test Strategies with Asset Administration Shells.....	346
<i>Stephan Schäfer, Dirk Schötke, Thomas Kämpfe, Vasil Denkov, Aaron Zielstorff</i>	

Deep Q-Learning Versus Proximal Policy Optimization: Performance Comparison in a Material Sorting Task..... <i>Reuf Kozlica, Stefan Wegenkittl, Simon Hirander</i>	353
Free Software and Open-Source Hardware for Industrial Automation..... <i>Balakrishna Balakrishna, Ivan Tyagov, Sven Franck</i>	359
A Semantic Model to Express Process Parameters and Their Interdependencies in Manufacturing..... <i>Tom Jeleniewski, Hamied Nabizada, Jonathan Reif, Aljosha Köcher, Alexander Fay</i>	365
A Methodology for Integrating Asset Administration Shells and Multi-Agent Systems..... <i>Lucas Sakurada, Fernando De La Prieta, Paulo Leitao</i>	371
Contract-Based Design for Low-Code Development in Industrial Edge Applications	377
<i>Deyuan Qu, Yingyue Zhang, Xiaoyu Hu, Wenbin Dai</i>	
Process-Product-Resource Based Requirement Model for Discrete Manufacturing Systems..... <i>Qiuyue Wang, Yingyue Zhang, Qinyun Hu, Xiao Wu, Wenbin Dai</i>	383
Effective Severity Assessment of Parkinson's Disease with Wearable Intelligence Using Free-Living Environment Data	389
<i>Liu Tao, Xulong Wang, Fengtao Nan, Jun Qi, Yun Yang, Po Yang</i>	
Proposal and Implementation of K-Anonymization Method for Data Insertion and Deletion	399
<i>Keiten Han, Hiroaki Nishi</i>	
Presentation of Underwater Sensation by Drag in Knee Motion with a Lower Limb Exoskeleton Using MR Fluid Brakes..... <i>Ryunosuke Sawahashi, Taiki Masuda, Taiga Shimizu, Rie Nishihama, Manabu Okui, Taro Nakamura</i>	405
Artificial-Voice-Based Conversational Lecture Video Clips for Flipped Classroom	411
<i>Kazuhiro Umetani, Yoshitaka Toyota, Masataka Ishihara, Eiji Hiraki</i>	
An Explainable Artificial Intelligence Approach for Force Estimation from Surface-EMG Sing the Element Description Method..... <i>Daiki Sodenaga, Issei Takeuchi, Daswin De Silva, Seiichiro Katsura</i>	418
Analysis of Latent Factors Affecting Video Game Performance Using Machine Learning Methods	424
<i>Julia Orlova, Anton Stepanov, Anton Vinogradov, Lubov Orlova, Anna Baldycheva, Andrey Somov</i>	
Design and Preliminary Evaluation of a Virtual Reality with Haptic Feedback Tool for Spatial Neglect Assessment and Rehabilitation..... <i>Mohamed Guiatni, Mouloud Tair, Yacine Amara, Brahim Bouksani</i>	430
Non-Contact Physiological Monitor Based Fuzzy Control for Treadmill	436
<i>Pei-Chun Hung, Yu-Chen Liu, Chun-Liang Lin, Wen-Chun Huang</i>	
Design of a Novel Dual Three-Phase Dual Stator Axial Flux Permanent Magnet Machine with Mechanical Offset	440
<i>Rundong Huang, Bowen Zhang, Zaixin Song, Yuxin Liu, Yong Chen, Chunhua Liu</i>	
Power Quality Disturbance Identification Algorithm Based on Empirical Wavelet Transform and Time-Domain Kurtosis Feature Analysis	446
<i>Chi Zhang, Yizhi Zhu, Caiyang Yu, Jiawei Bao, Qingsong Wang, Giuseppe Buja</i>	

Improved Predictive Control for Dual Motors Drives with Phase Angle Regulation.....	451
<i>Yong Chen, Rundong Huang, Hao Wen, Bowen Zhang, Zaixin Song, Chunhua Liu</i>	
Common-Mode Voltage Reduction-Based Space Vector Modulation Strategy for Three-Phase Two-Level Inverter with Delta-Connected Loads.....	457
<i>Zhiping Dong, Hao Wen, Tianci Wang, Bowen Zhang, Zaixin Song, Chunhua Liu</i>	
Stator Intermittent Ground Fault Detection in High-Impedance Grounded Generators.....	463
<i>Nader Safari-Shad, Russ Franklin</i>	
Development of High Voltage Switched Reluctance Starter/Generator System for More Electric Aircraft	470
<i>Chenyi Yang, Shoujun Song, Chaoyang Liu, Jixi Zhong, Guilin Sun</i>	
A Novel Indicator-Based On-Line Diagnosis Technique of Inter-Turn Short Circuit Faults in Asymmetrical Six-Phase Induction Machines, Adopting a Model Predictive Controller.....	476
<i>Khaled Laadjal, João Serra, Antonio J. Marques Cardoso</i>	
Segmentation Effects in the Modular HVDC Offshore Wind Generator and Its Impact on Losses	482
<i>Yannick Cyiza Kakezezi, Zhaoqiang Zhang, Pål Keim Olsen</i>	
Nonlinear Three-Phase Reluctance Synchronous Machine Modeling with Extended Torque Equation	487
<i>Johannes Rossmann, Niklas Monzen, Maarten J. Kamper, Christoph M. Hackl</i>	
A Coupled Electromagnetic-Thermal Dynamic Model for Wind Turbine Permanent Magnet Synchronous Generator Operation Analysis.....	494
<i>Aras Ghafoor, Siniša Djurović, Judith Apsley</i>	
Multiparameter Estimation Accuracy Improvement for PMSMs Using a Constriction Coefficient-Based Particle Swarm Optimization.....	500
<i>Sana Etemadi, Hongfu Cheng, Mohammad Sedigh Toulabi, Uday Deshpande, Narayan C. Kar</i>	
A Simple Disturbance Observer for Stator Flux Linkage Estimation of Nonlinear Synchronous Machines	506
<i>Niklas Monzen, Bernd Pfeifer, Christoph M. Hackl</i>	
Artificial Neural Network Based Optimal Feedforward Torque Control of Electrically Excited Synchronous Machines.....	512
<i>Niklas Monzen, Christoph M. Hackl</i>	
I/O-Linearization Based Current Decoupling Control of Modular Multilevel Cascade Converters.....	520
<i>Oliver Kalmbach, Christoph M. Hackl</i>	
Thermo-Electrical Modeling of Multilevel Switching-Cell-Array-Based Power Converters	527
<i>Roya Rafiezadeh, Sergio Busquets-Monge, Salvador Alepuz</i>	
Variant Parameters Identification of the PEMEL Circuit Model by RMSE-Based Self-Tuning Method	535
<i>Hamed Nezhadkhahami, Amin Hajizadeh, Mohsen Soltani, Damien Guilbert</i>	
Improved Dead-Beat Control for Single-Phase LC-Coupling Hybrid Active Power Filter (LC-HAPF)	541
<i>Pak-Ian Chan, Wai-Kit Sou, Chi-Seng Lam</i>	

An Efficiency-Enhanced LCC-S Based Inductive Power Transfer Converter Throughout Battery Constant Current Charging Process.....	547
<i>Yuying Luo, Io-Wa Iam, Zhaoyi Ding, Pak-Ian Chan, Chi-Seng Lam</i>	
Input Impedance Modeling of Dual-Active-Bridge-Based Input-Series Output-Parallel Converters	552
<i>Jiajun Yang, Sandro Guenter, Giampaolo Buticchi, Chunyang Gu, Marco Liserre, Pat Wheeler</i>	
Basic Study of a Heat Distribution Control Method for an Induction Heating System with Three AC-AC Direct Converters	557
<i>Shunta Inami, Shohei Komeda</i>	
A Detection Method of Misalignment for a WPT System Using Three-Power Transfer Circuits.....	563
<i>Rin Arai, Shohei Komeda</i>	
Voltage Balancing Analysis of DC-Link Capacitors in Six-Phase Three-Level T-Type Inverters.....	569
<i>Luca Vancini, Michele Mengoni, Gabriele Rizzoli, Luca Zarri, Angelo Tani</i>	
Choke-Less Class-E Oscillator Using p-MOSFET and n-MOSFET	575
<i>Yuta Ikutajima, Hirotaka Koizumi</i>	
A Novel Technique to Mitigate the Overlap-Time Effect in Current Source Inverters	581
<i>Umer Sohail, Trond Østrem, Bjarte Hoff</i>	
Small-Signal Stability Analysis of Power Converters with Optimal Pulsewidth Modulation Strategies	588
<i>Leyre Rosado, Javier Samanes, Jesus Lopez, Eugenio Gubia</i>	
Wireless Power Transfer with Resonant Pulsed Current Converter	595
<i>Dodi Garinto, Theodora Valerie, Taufik Taufik, Setiyo Budiyanto, Joni Welman Simatupang</i>	
Enhancement of Steady State Response of Indirect Finite Control Set Model Predictive Control	601
<i>Saad Hamayoon, Morten Hovd, Jon Are Suul</i>	
Closed-Loop Simulation Testing of a Probabilistic DR Framework for Day Ahead Market Participation Applied to Battery Energy Storage Systems.....	609
<i>Ties Van Der Heijden, Peter Palensky, Nick Van De Giesen, Edo Abraham</i>	
High-Performance IoT Module for Controlling and Testing PV Panels.....	615
<i>Miguel Tradacete-ágreda, Enrique Santiso-Gómez, Francisco Javier Rodriguez-Sánchez, Pablo José Hueros-Barrios, Carlos Santos-Perez, Rafael Pérez-Sergui</i>	
Multifrequency Power Transfer in a Power Distribution Line	621
<i>Xavier Genaro-Muñoz, Hugo Valderrama-Blavi, Roberto Giral</i>	
Phase-Independent Control of a Three-Phase Four-Leg Inverter	627
<i>Iñaki Aizpuru, Asier Davila, Estefanía Planas, José Antonio Cortajarena, José Luis Martin</i>	
Exploration of For-Purpose Decentralized Algorithmic Cyber Attacks in EV Charging Control	633
<i>Mahan Fakouri Fard, Xiang Huo, Mingxi Liu</i>	
On Interoperability of Datacentre and the Energy Market in the Nordic Region	639
<i>Chen-Wei Yang, Nikolai Galkin, Valeriy Vyatkin</i>	
An Emulator for Static and Dynamic Performance Evaluation of Small Wind Turbines.....	645
<i>Adrien Prévost, Vincent Léchappé, Romain Delpoux, Xavier Brun</i>	

Mapping the Optimal Sites for Offshore Wind Power Plants and Green Hydrogen Production: South and Southeast Brazilian Case Study.....	651
<i>Karen De Paula, Hayro Pumallocolla, Mahdi Pourakbari-Kasmaei, Joel D. Melo, Djalma Falcão</i>	
A Low-Cost Digital Twin for Real-Time Monitoring of Photovoltaic Panels	658
<i>Pablo José Hueros-Barrios, Francisco Javier Rodríguez Sánchez, Miguel Tradacete-ágreda, Pedro Martín, Carlos Santos Pérez, David Perez-Saura</i>	
Photovoltaic and Wind Power Plants Production Profiles Generation from Scarce Data.....	664
<i>Antonio Karelutti, Filip Rukavina, Mario Vašak</i>	
Fast Earth-Fault and Feeder Detection in Medium-Voltage Distribution Power Grids	670
<i>Josef Štengl, Tomáš Komrska, Zdenek Peroutka</i>	
FIWARE-Based Architecture for Smart Local Energy Communities.....	676
<i>Max Thoma, Gernot Steindl, Wolfgang Kastner</i>	
Black Soldier Fly Bioconversion System: A Digital Twin Approach	680
<i>Guangtao Yu, Hiroaki Nishi, Cheng Pang, Qingqing Gu, Yonghao Lin, Jinxian Liang, Wenbin Dai, Valeriy Vyatkin</i>	
Detection of Powdery Mildew Pest in Apple Tree Leaves Using Deep Learning in Intelligent Sprayer Robots	684
<i>Ali Aghajanpoor, Majid Sorouri, Arash Sharifi</i>	
Optimization Design of Permanent Magnet Synchronous Motor Torque Ripple Based on Stator Tooth Crown Slotting Method.....	688
<i>Mingle Jin, Ling Luo, Yuan Chai, Jian Song, Fei Jiang, Yixin Shao</i>	
FPGA Validated Advanced Learning-Based Voltage Control of DC/DC Converter Feeding CPL in DC Microgrid Applications	694
<i>Hussain Sarwar Khan, Kimmo Kauhaniemi</i>	
Design Considerations of Outer-Rotor Flux-Modulated Permanent-Magnet In-Wheel Motors.....	700
<i>Zekang Huang, Yixiao Luo, Wenyuan Mi, Zheng Cai, Fei Zhao, Hán Zhao, Jincheng Yu</i>	
Overshoot Reduction Inspired Recurrent RBF Neural Network Controller Design for PMSM.....	706
<i>Zhenxiao Yin, Hang Zhao</i>	
Design of a Novel Double-Stator Fault-Tolerant Transverse Flux Permanent Magnet Machine for Electric Propulsion Aircraft.....	712
<i>Bowen Zhang, Rundong Huang, Zaixin Song, Wusen Wang, Zhiping Dong, Chunhua Liu</i>	
Improving Vehicle Localization with Lane Marking Detection Based on Visual Perception and Geographic Information	718
<i>Jun-Yi Li, Huei-Yung Lin</i>	
Real-Time Dynamic Obstacle Avoidance for a Non-Holonomic Mobile Robot	724
<i>Mukhtar Sani, Ahmad Hably, Bogdan Robu, Jonathan Dumon, Nacim Meslem</i>	
Method of Artificial Vision in Guide Cane for Visually Impaired People.....	730
<i>Leonardo D. Medina-Madrazo, Julio C. Rodríguez-Quiñonez, Oscar Real-Moreno, Dayanna Ortíz-Villaseñor, Wendy Flores-Fuentes, Oleg Sergiyenko, Moises J. Castro-Toscano, Paolo Mercorelli</i>	

Asynchronous Multi-Task Learning Based on One Stage YOLOR Algorithm	736
<i>Cheng-Fu Liou, Tsung-Han Lee, Jiun-In Guo</i>	
Attack Prevention and Detection for Cyber-Physical Systems Based on Coprime Factorization Technique	741
<i>Shimeng Wu, Hao Luo, Yuchen Jiang, Kuan Li</i>	
An Interoperability Middleware for IIoT	747
<i>Pedro Henrique Morgan Pereira, Gustavo Cainelli, Carlos Eduardo Pereira, Joao Paulo J. Da Costa, Edison Pignaton De Freitas</i>	
Sustainability of ICPS from a Safety Perspective: Challenges and Opportunities	753
<i>Muhammad Gibran Alfarizi, Jie Liu, Jørn Vatn, Shen Yin</i>	
Cybersecurity of Industrial Automation and Control System (IACS) Networks in Biomass Power Plants	761
<i>Montri Wiboonrat</i>	
Finger Force Distribution Measurement System with Inclination Correction Function.....	767
<i>Lu Zhao, Koji Makino, Yasuo Kondo, Kazuki Yamada, Xiao Sun, Hidetsugu Terada</i>	
Estimating Changing Drive Timing Effects of Exosuit on Jumping Height for Augmenting Human Instantaneous Force	772
<i>Yusuke Ishii, Fumio Ito, Taro Nakamura</i>	
Shoe-Type Wearable Device for Measuring Ground Reaction Force and Center of Pressure.....	778
<i>Ryuichi Kawasaki, Seiichiro Katsura</i>	
Dominant Hand Invariant Parkinson's Disease Detection Using 1-D CNN Model and STFT-Based IMU Data Fusion.....	784
<i>Aleksei Shcherbak, Ekaterina Kovalenko, Ekaterina Bril, Anna Baldycheva, Andrey Somov</i>	
Analysis of Rehabilitation Methods for Small Dogs Based on the Muscular Activity.....	790
<i>Daisuke Chugo, Yujie Li, Satoshi Muramatsu, Sho Yokota, Jin-Hua She, Hiroshi Hashimoto, Hiroaki Kamishina, Hiroyuki Hirabayashi</i>	
Verification of Anode Position and Generated Force Vector of EHD at Wire-Cylinder Electrode.....	796
<i>Tomoya Kitamura, Hiroaki Katagiri, Shigeki Yashita, Yuki Saito, Hiroshi Asai, Kouhei Ohnishi, Takahiro Nozaki</i>	
Development of Optical Proximity/Biaxial Force Sensor and Application to Contact Movement	802
<i>Tomoaki Baba, Toshiyuki Murakami, Hermano Igo Krebs, Takahiro Nozaki</i>	
Handheld Haptic Drill Simulator Using Visual Servoing System for Axial Force Presentation	808
<i>Takuya Matsunaga, Shunya Takano, Tomoyuki Shimono, Kouhei Ohnishi, Mitsuru Yagi, Masaya Nakamura</i>	
Model-Based Pitch Angle Compensation for Center of Gravity Variation in Underactuated System with an Arm	814
<i>Hirotaka Kanazawa, Kosuke Ishizaki, Yasuhiro Miyata, Masamichi Nawa, Norihiko Kato, Toshiyuki Murakami</i>	
Frequency-Domain Modeling-Free Iterative Learning Control for Point-To-Point Motion.....	820
<i>Yoshihiro Maeda, Makoto Iwasaki</i>	
Universal Motion Controller: Adaptive Approach.....	827
<i>Tarik Uzunovic, Asif Šabanovic</i>	

Underactuated Control for Two-Wheeled Mobile Robot with an Arm Using Torque Constraint Conditions and Disturbance Observer	834
<i>Jin Ito, Toshiyuki Murakami</i>	
A DC-DC Modular Multilevel Converter Topology with Single Arm for MVDC Railway Application	840
<i>Sukrashis Sarkar, Anandarup Das</i>	
Reverse Engineering of the Hydrogen System of a Commercial Fuel Cell Vehicle	846
<i>Markus Meindl, Richard Öchsner, Johannes Geiling, Martin März</i>	
Dynamic Wireless Charging Using LCC-S Compensation Topology in Low and Medium Power Applications	852
<i>Martin Zavrel, Vladimir Kindl, Miroslav Tyrpekl</i>	
Optimal Components Sizing and Power Management for a Fuel Cell Electric Race Car Using a Bi-Level Strategy	858
<i>Essolizam Planté, Eric Bideaux</i>	
Feasibility Study of Using Modified Single-Phase Wireless Power Transfer System for Three-Phases Motor Driving	864
<i>Alireza Jafari-Natanzi, Amir Babaki, Thomas Ebel, Sadegh Vaez-Zadeh</i>	
ANN-Based Forecasting of Solar Irradiation Under Data Clustering: An Approach for Improved Estimation of PV Power Production	870
<i>Giuseppe La Tona, Maria Carmela Di Piazza</i>	
ICE: A Low-Cost IoT Platform Targeting Real-Time Anonymous Visitors Flow Tracking at Museums	876
<i>Vasileios Serasidis, Ioannis Sofianidis, Giorgos Margaritis, Christos Sad, Vasileios Konstantakos, Kostas Siozios</i>	
Embedded Intelligence of End Devices with MOS Sensors for CH ₄ Detection	882
<i>Simão Leite, Rui Costa, João Carvalho, Tomás Sapage, Rui Bessa, Sofia Paiva</i>	
Evaluation of AIoT-Based Smart Lighting System: An IDex Case Study	887
<i>Hao Wang, Kim Fung Tsang, Yang Wei</i>	
Adaptive Low-Computation Neural Network Control of Constrained Nonlinear Systems and Its Application to Agricultural Drones	892
<i>Kang Liu, Po Yang, Rujing Wang</i>	
Model Predictive Control Method for Nonisolated Universal Battery Charger	898
<i>Naki Guler, Ugur Fesli, Hasan Komurcugil, Sertac Bayhan</i>	
Distributed Sensor FD for Sensor Networks	904
<i>Jiarui Zhang, Steven X. Ding, Linlin Li</i>	
Online Exciter Controller Tuning for a Synchronous Condenser in a Weak Grid	910
<i>Ehsan Fouladi, Fatemeh Sharifi, Ali Mehrizi-Sani</i>	
Finite Element Dq-Model for MTPA Flux Control of Synchronous Reluctance Motor (SynRM)	916
<i>Romain Delpoux, Thomas Huguet, Federico Bribiesca Argomedo, Loïc Queval, Jean-Yves Gauthier, Zohra Kader</i>	

Analysis of the Zero Dynamics of Three-Phase Current Source Inverters Using a Complex-Valued Approach	922
<i>Leila Rahimi, Arnau Dòria-Cerezo, Robert Griñó</i>	
Motion Planning of Fly-Wing UAVs for Autonomous Landing in Cross-Wind.....	928
<i>Shao Pengyuan, Dong Yanfei, Tan Jian</i>	
Development of Automatically Controlled Facial Osteotomy Robot Using Force Information - For Safe Le Fort I Osteotomy -	934
<i>Koji Niwa, Kazuki Yane, Yusuke Kido, Tomoya Kitamura, Takahiro Nozaki</i>	
A Performance-Adaptive and Time-Monitored Autonomous Ticket Booking Service in Cloud.....	940
<i>Hongyun Liu, Maarten Oudejans, Ruyue Xin, Paola Grosso, Zhiming Zhao</i>	
Proposal of a Method for Measuring Inside Diameter of Tubes Using a Drive Unit of a Robot for Inspection of Small Tubes	946
<i>Hiroto Nagashima, Fumio Ito, Taro Nakamura, Kousuke Uchiyama, Manabu Okui</i>	
Distributed Formation Control and Dynamic Formation Transformation for Multi-Vehicle Systems Based on Virtual Leader-Follower Structure and Triggered Strategy	953
<i>Bohan Liu, Bing Yan</i>	
API for Data Transfer Using USB to CAN Converter.....	959
<i>Robert Plšicík, Matúš Danko</i>	
Decentralized Motion Control for a Novel Planar Motor Intralogistics System	965
<i>Lukas Steinle, Nico Helfesrieder, Armin Lechler, Alexander Verl, Ali Montazeri, Jinfan Wang</i>	
Learning Diverse and Efficient Goal-Reaching Policies for Robot Motion Planning	973
<i>Han-Cheng Yao, Chi-Kai Ho, Chung-Ta King</i>	
Extending Edge-Based Mobile Robot Navigation with Social Awareness.....	980
<i>Gábor Fehér, Dániel Rózsa, Marcell Balogh, Norbert Reider</i>	
Fuel Economy Simulation and Development of an Online Data Acquisition System with HIL Method for a VW Crafter Hybrid Car	984
<i>Aminu Babangida, Chiedozie Maduakolam Light Odazie, Péter Tamás Szemes</i>	
Parameter Estimation of Second-Life Lithium-Ion Batteries Through Subspace Identification Methods	988
<i>Marcelo Miranda Camboim, Aghatta Cioquette Moreira, Mateus Giesbrecht</i>	
Unscented Kalman Filter Based Coestimation of SoC and SoH _R in Lithium Battery with Hysteresis	994
<i>Luca Amyn Hattouti, Roberto Di Rienzo, Federico Baronti, Roberto Roncella, Roberto Saletti, Gianluca Aurilio, Riccardo Di Dio, Walter Nesci</i>	
Optimized Passive Battery Cell Balancing Algorithm for a Low-Cost Race Car.....	1000
<i>Matteo Bonora, Roberto Passerone</i>	
The in-Plane Thermal Conductivity of Lithium-Ion Cells: Parametric Influences and Simulative Prediction	1006
<i>Luca Tendera, Dominik Wycisk, Alexander Fill, Kai Peter Birke</i>	
From Model to Implementation: Engineering of Flexible Production Systems with RAMI 4.0.....	1014
<i>Christoph Binder, Ambra Calà, Jan Vollmar, Christian Neureiter, Arndt Lüder</i>	

Onsite Renewable Generation Time Shifting for Photovoltaic Systems	1020
<i>Rakshit Subramanya, Aaltonen Harri, Seppo Sierla, Valeriy Vyatkin</i>	
Method for Automatic Simulation Model Calibration and Maintenance for Brownfield Process Plants	1026
<i>Malte Ramonat, Alexander Fay</i>	
Driving Profile Analysis Using Machine Learning Techniques and ECU Data	1032
<i>Rafael Canal, Felipe Kaminsky Riffel, Giovani Gracioli</i>	
Formal Verification of Observers Supervising a Cyber-Physical System Implemented Using IEC 61499	1038
<i>Polina Ovsiannikova, Etienne Le Priol, Vincent Perret, Pranay Jhunjhunwala, Midhun Xavier, Valeriy Vyatkin</i>	
Methods of Data Streaming from IEC 61499 Applications to Cloud Storages	1044
<i>Tuojian Lyu, Nikolai Galkin, Tatiana Liakh, Chen-Wei Yang, Valeriy Vyatkin</i>	
Efficient Multi-Receptive Pooling YOLOv5 with Coordinate Attention Module for Object Detection on Drone.....	1050
<i>Jinsu An, Muhamad Dwisnanto Putro, Adri Priadana, Youlkyeong Lee, Junmyeong Kim, Kanghyun Jo</i>	
A Cybersecurity Framework for Home Energy Management Systems Using Artificial Intelligence.....	1056
<i>Lakshitha Gunasekara, Harsha Moraliyage, Daswin De Silva, Nishan Mills, Damminda Alahakoon, Andrew Jennings, Milos Manic</i>	
Concept of Blockchain-Based Micro-Service Control Strategy for a Domestic Water Heater.....	1062
<i>Marko Corn, Nejc Rožman, Primož Podržaj, Tomaž Berlec, Tomaž Požrl, Rok Vrabič</i>	
Modeling Energy Consumption of Industrial Processes with Seq2Seq Machine Learning.....	1067
<i>Simon Howind, Thilo Sauter</i>	
Automatic Microservice Orchestration and Deployment Method Based on the Modular Type Package for Industrial Edge Applications.....	1071
<i>Jiale Kang, Xiao Wu, Huiwen Wu, Dali Yang, Wenbin Dai</i>	
Improving the Execution Time of Industrial Applications Through Planned Cache Eviction Policy Selection	1077
<i>Sergio Arribas García, Giovani Gracioli, Denis Hoornaert, Tomasz Kloda, Marco Caccamo</i>	
Collective Learning for Energy-Centric Flexible Job Shop Scheduling.....	1083
<i>Arun Narayanan, Evangelos Pournaras, Pedro H. J. Nardelli</i>	
Accurate RF-Sensing of Complex Gestures Using RFID with Variable Phase-Profiles	1089
<i>Sahar Golipoor, Stephan Sigg</i>	
Work-In-Progress: Multimodal Odour and Image Recognition on Synthetic Dataset.....	1093
<i>Fanny Monori, Alin Tisan</i>	
ARTriViT: Automatic Face Recognition System Using ViT-Based Siamese Neural Networks with a Triplet Loss.....	1097
<i>Mustaqeem Khan, Muhammad Saeed, Abdulmotaleb El Saddik, Wail Gueaieb</i>	
Rapid FPGA Implementation of a Cost Effective Quaternion LMS Estimator	1103
<i>Alin Tisan, Clive Cheong Took</i>	

DenseNetx: Efficient DenseNets for Remote Scene Classification Without Pretraining	1109
<i>Russo Mohammad Ashraf Uddin, Tien-Dat Tran, Ge Cao, Kang-Hyun Jo</i>	
Vibration Auralization System Using High-Speed Vision.....	1115
<i>Kotaro Fujita, Feiyue Wang, Kohei Shimasaki, Idaku Ishii, Ryo Okamoto, Hironori Higashida</i>	
A Comparison of Extended Kalman Filters for Parameter Estimation of Sinusoidal Signals	1121
<i>L. A. Barragan, H. Sarnago, D. Navarro, O. Lucia</i>	
Unifying Local and Global Fourier Features for Image Classification	1127
<i>Xuan-Thuy Vo, Jehwan Choi, Duy-Linh Nguyen, Adri Priadana, Kang-Hyun Jo</i>	
Feasibility of Smartphone-Attached UWB Tag for Daily Life Indoor Pedestrian Tracking.....	1134
<i>Khawar Naheem, Mun Sang Kim</i>	
Disturbance Rejection for Pedaling Rehabilitation Robot Based on Integration of Equivalent-Input-Disturbance and Repetitive Control Methods.....	1138
<i>Yujian Zhou, Jinhua She, Feng Wang, Makoto Iwasaki</i>	
Cognitive Assistance for the Visually Impaired Using Haptics Presentation of Environmental Information.....	1143
<i>Takumi Sato, Mihoko Niituma</i>	
Fault Severity Estimation in 7-Phase Electrical Machines in a Noisy Environment.....	1147
<i>Lu Zhang, Claude Delpha, Demba Diallo</i>	
Hybrid Encoderless Control of Multi-Salient Induction Motors in Parallel Connection at Variable Flux and Torque.....	1153
<i>Eduardo Rodriguez Montero, Markus Vogelsberger, Thomas Wolbank</i>	
Modelling a Rotor Bar of an Induction Motor for Improving Electromagnetic Torque and Efficiency Using Permeance-Based Equivalent Circuit Model and FEA	1159
<i>Areej Fatima, Omolbanin Taqavi, Ze Li, Glenn Byczynski, Narayan C. Kar</i>	
Design and Analysis of a Highly Integrated Wireless Motor Drive System.....	1166
<i>Xingyu Liu, Yang Xiao, Yong Yang</i>	
Model Predictive Torque Control of Synchronous Machines Without a Current Or Stator Flux Reference Generator.....	1172
<i>Kyunghwan Choi, Ki-Bum Park</i>	
Quadratic Regression Model Based Predictive Control of PMSM Drives with Field Weakening Operation Capability Constrained to the Linear Modulation Range	1178
<i>Kristóf Bányi, Péter Stumpf</i>	
A PMaSynRM Stator Winding Fault Detection Approach Using an Optimized PCA-Based EWMA Control Scheme	1184
<i>Pakedam Lare, Siyamak Sarabi, Claude Delpha, Demba Diallo</i>	
Dynamic Drive Cycle Model of a Fuel-Cell Powered Hybrid Bus	1190
<i>Martin Novak, Jan Gruber</i>	
Modeling and Experimental Validation of a LTO Battery Cell for a Hydrogen Hybrid Bus	1196
<i>Martin Novak, Zdenek Novak</i>	
Comparative Study of Excitation Signals for Active Fault Diagnosis of Belt Drives	1202
<i>Moritz Fehsenfeld, Johannes Kühn, Karl-Philipp Kortmann</i>	

Influence of the Flux Sensor Position for Rotor Fault Detection in WRIM: A Power Spectral Entropy Analysis	1209
Jose Guerra Carmenate, Miguel E. Iglesias Martínez, Jose A. Antonino-Daviu, Pedro Fernandez De Cordoba, Larisa Dunai, Alfredo Quijano-Lopez	
Design and Performance Optimization of a Novel High Temperature Superconducting Linear Flux-Switching Motor.....	1215
Xiangdong Su, Hang Zhao, Fang Li	
Automatic Classification of Stator Asymmetries and Insulation Thermal Damages in Induction Motors, Applying Persistence Spectrum and a Convolutional Neural Network to the Stray-Flux Signals	1220
Vicente Biot-Monterde, Angela Navarro-Navarro, Israel Zamudio-Ramirez, Jose Antonino-Daviu, Roque A. Osornio-Rios, Jose E. Ruiz-Sarrió	
Sensorless Control Strategy for Magnetic Drive-Trains Based on Adaptive Nonlinear State Observer	1226
Qiming Zhong, Qipeng Tang, Sang Xu, Xin Luo, Anwen Shen	
Fault-Tolerant Active Neutral-Point-Clamped Multilevel Inverter Maintaining Output Voltage at Failure.....	1233
Jun Hitokuwata, Hirotaka Koizumi	
Selective Harmonic Mitigation-Pulse Amplitude Modulation Technique for 7-Level Inverters	1239
Concettina Buccella, Maria Gabriella Cimoroni, Francesco Simonetti, Carlo Cecati	
SiC JFET/P-MOSFET Cascode for SSCB and Inrush Current Limiter in 300V DC Power Systems.....	1245
A. Garrigós, D. Marroquí, J. M. Blanes, C. Torres, C. Orts, P. Casado	
Modelling and Control of Multi-Port DC-DC Converter for Offshore Wind-Hydrogen Energy Systems.....	1251
Shahriar Farajdadian, Amin Hajizadeh, Mohsen Soltani	
Multi-Objective SHM-PWM Modulation Technique for CMV Control in 3-Phase Inverters.....	1257
Mohammad Sharifzadeh, Mahdieh S. Sadabadi, Eric Laurendeau, Kamal Al-Haddad	
Asymmetrical Firing Angle Modulation for 12-Pulse Thyristor Rectifiers Supplying High-Power Electrolyzers.....	1263
Álvaro Iribarren, Ernesto L. Barrios, David Elizondo, Pablo Sanchis, Alfredo Ursúa	
Modeling a Grid-Forming DFIG Wind Turbine	1270
Iker Oraa, Javier Samanes, Jesus Lopez, Eugenio Gubia	
Switching Control to Enhance Performance in Smart Protections	1278
Manuela La Rosa, Giovanni Sicurella, Salvatore D'Angelo, Davide Patti, Donata Nicolosi	
Fault Detection, Localization and Clearance for MMC Based on Indirect Finite Control Set Model Predictive Control.....	1282
Saad Hamayoon, Morten Hovd, Jon Are Suul	
A Orientation Tolerant Wireless Power Transfer System Using Bipolar Coil Topology	1290
Jure Domajnko, Rok Friš, Mitja Truntic, Nataša Prosen	
Demonstration of On-Road Vehicle Drive with Electric Motor Fed by Power Packets	1294
Shiu Mochiyama, Taketsune Nakamura	

High-Fidelity Averaged Model of Grid-Following Inverter for Stability Analysis Considering the PLL Influence	1298
<i>Naiara Goñi, Javier Marcos, Miguel García, Alberto García, Andoni Urtasun, Luis Marroyo</i>	
A Z-Source Ac Circuit Breaker	1302
<i>Keith Corzine, Yuan Li, Fang Peng</i>	
Modeling and Control of Differential-Drive Chassis for a Homecare Assistive Robot.....	1306
<i>Ping He, Honghao Lv, Haiteng Wu, Geng Yang</i>	
Headset Gas Sensor for Monitoring of Blood EtOH	1310
<i>Kohji Mitsubayashi, Shota Suzuki, Kenta Ichikawa, Kenta Itani, Koji Toma, Takahiro Arakawa</i>	
Architecture of a Feedback System for Human-Machine Interaction in a Collaborative Environment	1312
<i>Mikhail V. Kolesnikov, Jan Olaf Blech, Udayanto Dwi Atmojo, Valeriy Vyatkin, Maxim Ya Afanasev</i>	
Perturbation Device for Crutch Walk Training	1316
<i>Naoaki Tsuda, Ryosei Ikoma, Ryo Takahashi, Kodai Hayashi, Susumu Tarao, Yasunori Fujiwara, Yoshihiko Nomura, Norihiko Kato</i>	
Automated Machine Learning in Critical Energy Infrastructure for Net Zero Carbon Emissions	1320
<i>Harsha Moraliyage, Dilantha Haputhanthri, Chamod Samarajeewa, Nishan Mills, Daswin De Silva, Milos Manic, Andrew Jennings</i>	
Tiny Federated Learning with Bayesian Classifiers	1327
<i>Ning Xiong, Sasikumar Punnekkat</i>	
Debugging Approach for IEC 61499 Control Applications in FBME.....	1333
<i>Daniil Akifev, Tatiana Liakh, Polina Ovsianikova, Radimir Sorokin, Valeriy Vyatkin</i>	
Augmenting Industrial Chatbots in Energy Systems Using ChatGPT Generative AI	1338
<i>Gihan Gamage, Sachin Kahawala, Nishan Mills, Daswin De Silva, Milos Manic, Damminda Alahakoon, Andrew Jennings</i>	
Application of Deep Learning Method to Estimate Bottomhole Pressure Dynamics of Oil Wells	1344
<i>Haibo Cheng, Shichao Li, Peng Zeng, Valeriy Vyatkin</i>	
Towards Migration from IEC 61131-3 to IEC 61499 in Process Industry: Redesign of Visualisation.....	1350
<i>Hiruni Kothalawala, Pranay Jhunjhunwala, Valeriy Vyatkin</i>	
Physical Anomaly Detection in EV Charging Stations: Physics-Based Vs ResNet AE	1356
<i>Harindra S. Mavikumbure, Victor Cobilean, Chathurika S. Wickramasinghe, Tyler Phillips, Benny J. Varghese, Barney Carlson, Craig Rieger, Timothy Pennington, Milos Manic</i>	
Temperature Indicators and Overtemperature Detection in Lithium-Ion Batteries Based on Electrochemical Impedance Spectroscopy	1363
<i>Iñaki Lalinde, Alberto Berrueta, Adrian Soto, Joseba Arza, Pablo Sanchis, Alfredo Ursúa</i>	
Onset of Irreversible Reactions in Overcharging Lithium-Ion Cells: An Experimental and Modeling Approach	1369
<i>Elisa Irujo, Alberto Berrueta, Iñaki Lalinde, Joseba Arza, Pablo Sanchis, Alfredo Ursúa</i>	
Integrated Lithium-Ion Battery Model and Experimental Validation of a Second-Life Prototype.....	1375
<i>Ane Pérez, Idoia San Martín, Pablo Sanchis, Alfredo Ursúa</i>	

Survey on Current Large-Scale Energy Storage Systems.....	1381
<i>Jan Haase, Ahmad Almaghrebi, Fares Aljuheshi, Sam Moayedi, Nasser Aljuhaishi, Mahmoud Alahmad</i>	
Charging Control of a Vanadium Redox Flow Battery Integrated with Solar PV Plant	1390
<i>Mojtaba Hajhosseini, Mateja Car, Zeeshan Aleem, Vinko Lešić</i>	
Frequency-Domain System Identification of a First Order Governor-Turbine Model from PMU Ambient Data	1396
<i>Jin Kwon Hwang, Janne Seppänen</i>	
On the Relationship Between Inter-Area Modes and Power System Inertia.....	1400
<i>Janne Seppänen, Matti Lehtonen, Jin Kwon Hwang</i>	
LVDC Vs LVAC: A Comparison of System Losses	1404
<i>Maximilien Marc, Dominique Roggo, Miikka Säteri, Tero Tuomarmäki, Samuli Ranta</i>	
An Unbiased Fuzzy Double Q-Learning Based Energy Management for Fuel Cell Hybrid Electric Vehicles	1408
<i>Liang Guo, Zhongliang Li, Rachid Outbib</i>	
An Efficient Adaptive Algorithm for Batteries Charging Supplied by Photovoltaic Panels.....	1415
<i>Yacine Triki, Ali Bechouche, Hamid Seddiki, Djaffar Ould Abdeslam, Radu Porumb</i>	
A New Optimal Centralized Demand Side Management for a Campus Smart Microgrid	1421
<i>Mohamed A. Hassan, Abdelfattah A. Eladl, Bishoy E. Sedhom, Mohammed A. Saeed</i>	
LSTM Networks for Cyber-Physical Attack Diagnoses in Microgrids	1427
<i>Bushra Canaan, Bruno Colicchio, Djaffar Ould Abdeslam, Lhassane Idoumghar</i>	
Model-Free HVAC Optimizer Based on Reinforcement Learning.....	1433
<i>Charalampos Marantos, Christos Lamprakos, Kostas Siozios, Dimitrios Soudris</i>	
Blockchain for Transactive Energy Marketplace.....	1441
<i>Ameni Boumaiza, Antonio Sanfilippo</i>	
Online Parameter Estimation of Dual Three-Phase Permanent-Magnet Synchronous Machine for More-Electric Aircraft Applications	1446
<i>Shengyu Cao, Tao Yang, Yuzheng Chen, Serhiy Bozhko, Pericle Zanchetta</i>	
An Investigation into Permanent Magnet Hysteresis Losses in Reverse-Salient Permanent Magnet Synchronous Motors.....	1451
<i>Immanuel Williams, Anouar Belahcen, Shrikrishna V. Kulkarni</i>	
Transient Thermal Analysis of Totally Enclosed Railway Traction Motor with High Power Density	1457
<i>Choung-Seo Kim, Woo-Young Lee, Hyung-Woo Lee</i>	
Performance Comparison of Modulation Techniques for Modular Multilevel Converter.....	1461
<i>Anthony Abdayem, Jean Sawma, Flavia Khatounian, Eric Monmasson, Ragi Ghosn</i>	
High-Dynamics P-E and Q-f Control of PV Inverters for Strong and Weak Grids	1467
<i>Ibai Urtasun, Andoni Urtasun, Luis Marroyo</i>	
Modified Model Predictive Control for Power Balancing in Multilevel Inverter for Battery Energy Storage Applications.....	1473
<i>Henry Grote, Yuehao Zhu, Sally Sajadian</i>	

Improved Transient Response in Inverter-Based Resources Using Deep Reinforcement Learning.....	1479
<i>Ashwin Venkataraman, Ali Mehrizi-Sani</i>	
Concept of an Optical Distance and Speed Sensor Using Novel Offsetless Spatial Frequency Filters in the Area of Functional Safety	1485
<i>Frank Wasinski, Werner Bonath, Ubbo Ricklefs, Josef Börcsök, Michael Schwarz, Eike Hahn</i>	
Experimental Qualification of a Low-Noise Charge-Sensitive ROIC with Very High Time Resolution.....	1491
<i>Alireza Mohammad Zaki, Stoyan Nihtianov</i>	
Capacitive Sensor-Based Smart Water Tap: A Feasibility Study	1497
<i>V Saikumar, Kazi Jaber Akram, Boby George</i>	
Physics-Data Cooperative Ship Motion Prediction with Onboard Wave Radar for Safe Operations	1502
<i>Motoyasu Kanazawa, Tongtong Wang, Robert Skulstad, Guoyuan Li, Houxiang Zhang</i>	
Review of Different Current Control Strategies for Thyristor-Controlled LC-Coupling Hybrid Active Power Filter.....	1510
<i>Wai-Kit Sou, Pak-Ian Chan, Cheng Gong, Chi-Seng Lam</i>	
Attenuation of Voltage Distortion Effects on a Three-Phase Grid-Connected Converter.....	1516
<i>Mauro Boi, Andrea Floris, Alessandro Serpi, Alfonso Damiano</i>	

Author Index