

IECON 2025 - 51st Annual Conference of the IEEE Industrial Electronics Society

Tuesday, 14 October 2025

09:30-12:30

Escorial

Tutorial 10 - Self Supervised Anomaly Detection to Improve Security of Cyber Physical Systems

El Jardin

Tutorial 1 - Advanced Static and Dynamic Wireless Charging: Empowering Modern EVs and AGVs

Discover the latest advances in wireless static and dynamic charging! We'll cover wireless power transfer fundamentals, misalignment-tolerant magnetic couplers, efficient control strategies, and advanced wireless onboard charger architectures. Gain practical insights from dynamic and static charging case studies and participate in interactive discussions to address technical barriers and future trends in wireless charging for EVs and AGVs.

Comendador

Tutorial 4 - DL-based forecasting of energy related time series: tuning, evaluation, and reproducibility

This tutorial introduces deep learning methods for short-term multi-step forecasting of

energy-related time series, such as electrical load and PV generation.

Participants will

learn model design, data preparation, evaluation metrics, and common pitfalls.

Practical

reproducibility tools and good practices will also be presented, with hands-on examples to

support reliable research and industrial applications.

Doblon

Tutorial 9 - Recent Advances, Future Trends and Challenges of Model Predictive Control applied to Power Electronics

Recently, the rapid advancement of modern microcontrollers has revolutionized power converter control, enabling the development and implementation of new intelligent control and modulation strategies. Among these, Model Predictive Control (MPC) has emerged as a powerful and versatile alternative, getting significant attention from both academia and industry. MPC offers numerous advantages over classical linear controllers, including its intuitive design, elimination of linear controllers and modulators, and seamless integration of nonlinearities and constraints into the control law. These features make MPC strategies a highly promising solution for tackling complex control challenges in various areas of power electronics. Therefore, this tutorial will address the latest advancements and trends in MPC for power converters, highlighting its practical benefits and potential for widespread industrial adoption. Participants will gain insights into the fundamental principles of MPC, explore state-of-the-art applications, and learn about emerging opportunities and challenges for optimizing system performance. The tutorial will provide a comprehensive understanding of how MPC is reshaping the future of power electronics and drives, bridging the gap between academic research and real-world implementation.

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	Escudo Entrepreneurship workshop This immersive workshop is designed for technical experts who want to acquire entrepreneurial skills and a startup mindset. It provides a unique opportunity to learn how to transform deep technical expertise into viable ventures. Whether you're exploring alternative career paths or seeking fresh approaches to innovation and leadership, this program equips you with practical tools and frameworks used by successful Silicon Valley startups. Open to IECON attendees, but seats are limited and registration via the Conference Registration Form is required.
13:30-17:30	Galeria Tutorial 7 - IEEE 1451 Hands-on Lab Workshop
	Doblon Tutorial 5 - Efficient SoC based Hardware in the Loop: HiL (to climb) for Renewable Energy Systems The tutorial includes a hands-on session and the attendees will require a laptop with AMD VIVADO and VITIS (v2021.x or higher) installed (free to download from https://www.xilinx.com/support/download.html)
14:30-17:30	Escorial Tutorial 2 - Artificial Intelligence Enhanced Energy Management for Sustainable Energy Systems This tutorial discusses most recent progresses in consensus-based distributed control of SESs, reinforcement learning based energy management and trading of SESs and AI assisted interaction of SESs with active distribution system, to yield relevant insights and promote exchange of experiences on leveraging AI/GenAI technologies for better energy management of SESs in IES communities.
	El Jardin Tutorial 8 - Impedance Modelling and Passivity Design for Power Electronics-Dominated Power Systems With the increasing penetration of renewable energy, the power system is experiencing a transition, and the effect of power electronics should be considered for the stability analysis. This tutorial is closely aligned with the GreenTech subtopic of IECON 2025, focusing on impedance theory and its applications in power electronics-based power systems. It comprises five sections: Section 1 offers historical insights into impedance theory; Sections 2 and 3 cover high-frequency modeling and damping strategies, while Sections 4 and 5 address low-frequency modeling and damping techniques. The tutorial is intended for researchers, engineers, and graduate students interested in modeling and control at both the converter and system levels.
	Comendador Tutorial 3 - Charging Infrastructure and Grid Integration for Electromobility This tutorial offers a comprehensive analysis of EV charging infrastructure

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	from a power electronics perspective, covering everything from light- to heavy-duty vehicles. It examines current standards, deployment challenges, and future trends, supported by industrial case studies. Emphasis is placed on fast, scalable, and future-ready solutions essential for consumer trust, EV adoption, and supporting a sustainable, grid-integrated electric system. The tutorial is a valuable resource for specialists, practitioners, non-experts and policymakers.
	Escudo Tutorial 6 - Ethics in Industrial AI: Trust, Transparency & Accountability This tutorial examines the critical intersection of AI ethics and cyber-physical systems, with a focus on industrial IoT and automation. Participants will explore key ethical considerations- trust and transparency, accountability, bias and fairness, and security and privacy. The session introduces the IEEE 7000-2021 standard and IEEE ontological frameworks for ethical accountability, bias, privacy, and transparency, and demonstrates their practical implications through real-world project examples.
18:30-19:30	Tapices Welcome reception
19:30-21:00	Tapices IES Officer Candidates Forum

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08:30-10:00	Escorial S05-I-SS04 - Advanced Control and its Application in Complex Industrial Systems Chairs: Xiaoning Shen, Zhongcheng Lei Sparse Modeling for Multiple Data-Driven Predictors in High-Mix Production Systems <i>Sanga TAKAGI, Osamu Kaneko</i> Modified Equivalent-Input-Disturbance Strategy and Fractional-Order Phase-Adaptive Feedforward Repetitive Control for PMSM Current Disturbance Suppression <i>Jiaxing Ye, Mingyi Wang, Shun Cai, ruiqi xu, Sihang Cui, Junchi Li, chengming Zhang, Liyi Li</i> Soft-Actor-Critic-based Anti-Sway Control for Port Crane Systems with Bounded Disturbances <i>Zhenxiang WANG, Yilian ZHANG, Weimin XU</i> A non-singular predefined-time sliding mode tracking control for PMSM Servo System <i>ruiqi xu, Zhuang Liu, Xinpo Lin, Shun Cai, Qiaoman Zhu, Jianxing Liu</i> Energy management strategy for solid oxide fuel cell and photovoltaic integrated systems based on swarm intelligence optimization <i>Yingxue Chen, Changyu Ni, Zhixing Ji</i> Robust Control of Drill String in Horizontal Boreholes of Coal Mines Considering Wall Friction <i>liu xiao, Luefeng Chen, Chengda Lu, Min Wu, Pedrycz Witold</i> Direct Torque Controller with Fuzzy-Tuned Switching Gain for Torque Ripple Suppression in Switched Reluctance Motor Drives <i>Xijian LIN, Zifeng Chen, Shuo ZHANG, Lei Yang, Dianxun Xiao</i> Inductance Parameter Online Identification-Based Super-Twisting
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Control of NPC Converters Zhuang Kang, Xiaoning Shen, Yijie Wang, Guangxin Liu, Jianxing Liu, Sergio Vazquez
Robust Nonlinear Control of Laser Scanning System under Stochastic Mechanical Disturbances José A. Núñez-López, Oleg Sergiyenko, Ruben Alaniz-Plata, Dennis Molina-Quiroz, Cesar Sepulveda Valdez, Fernando Lopez-Medina, David Meza-Garcia, Vera Tyrsa, Wendy Flores-Fuentes, Julio Rodriguez, J. Fabián Villa-Manríquez, Fabian Murrieta, Marina Kolendovska, Paolo Mercorelli
Transformer-based Human Action Recognition for Fine-Grained Industrial Assembly Tasks Mayra Vanessa Alvear Gallon, Cosimo Patruno, Gadea Mata, César Domínguez, Grazia Cicirelli

Hidalgo

S02-I- TT01-2 - Electric Machines and Industrial Drives II

Chairs: Thomas Wolbank, Christoph Hackl

Time-efficient prediction of the complex spatial harmonic leakage inductance of DFIGs considering slot openings and magnetic saturation effects Xi Zhu, Bernd Ponick

Simultaneous Assessment and Fault-Tolerant Optimization of Flux-Switching Wound Field Machines Under Rotor Eccentricity

Faults Chiweta Abunike, Ogbonnaya Okoro, Sumeet Aphale

A Fast Open-Circuit and Short-Circuit Fault Diagnosis of AMB Amplifiers Driven by Switching States and Multi-Current-Sensor

Data Yihua Chen, Dong Jiang, Yixuan Shuai, Mingqu Zhou, Jianfu Ding, Zicheng Liu

Transient response shaping and its application to nonlinear PI-based current control systems Christoph Hackl

Development of a State and Disturbance Observer for a Wind Turbine and Implementation on a Machine Test Bench Tim Tölle, Benedikt Spichartz, Lars Siepelmeyer, Constantinos Sourkounis

Distributed cast tooth-coils in electrical machines: Opportunities and Challenges Kora Winkler, Amir Ebrahimi

Parameterized Topologies for Enhanced Electromagnetic Design

Optimization of Radial-Flux Synchronous Machines Fernando J. T. E. Ferreira, Inês Ferreira, André Silva

Star Point Overvoltage Resonance Effects in Traction Motor Windings

Caused by Close-in-Time Inverter Phase Switchings Paul Aspalter, Markus Vogelsberger, Uwe Drofenik, Hans Ertl

Analysis of Startup Characteristics of Single-Phase Wound-Brushless Exciters Using Analytical Modeling for Aircraft Integrated Starter

Generator Tuan Nguyen, Sarbajit Paul, Ji-Heon Lee, Jae-beom Kang, Hyeong-Jin Kim, Ji-Young Lee

Novel Encoderless Detection of Motor-Bogie Suspension Failure in Railway Applications Eduardo Rodriguez Montero, Markus Vogelsberger, Cedric Zanutti, Thomas Wolbank

Toledo

IEEE Life Members Affinity Group Meeting

El Jardin

Meet IES Technical Committees

Organizers: Marina Indri, Yajun Pan, Lucia Lo Bello, Valeriy Vyatkin

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- Welcome by the Organizers (5')
- Valeriy Vyatkin: "IES Technical Committees and Clusters: structure and activities" (15')
- Daswin De Silva: "IES Generative AI Hackathon Challenge" (10')
- Victor Huang: "Standardization activities of IES" (10')
- Cheng Pang: "IES-TC-II: Bridging Academia, Industry, and Locals via Cups, Summer Schools, Boot Camps, and more" (10')
- Davide Barater: "EMERGE summer school in Electrical Machines and Drives for Green Transportation systems" (10')
- Jose Barbosa: "Industrial Agents as Catalyst for Industry 4.0: 11 Years of Empowering Innovation Through Summer Schools" (10')
- Q&A + refreshments (20')

Galeria

IES TC on Smart Grid Workshop

Comendador

S06-I-SSGT-7 - Advanced Control Techniques for Power Electronics Converters

Chairs: Hasan Komurcugil, Naki Guler

In-Situ Diagnosis of Lithium-ion Batteries via Dynamic

Electrochemical Impedance Spectroscopy *Xinghao Du, Jinhao Meng, YASSINE AMIRAT, Fei Gao, Mohamed Benbouzid*

Core Temperature Estimation of Lithium-Ion Batteries Using Physics

Informed Neural Network and Kolmogorov-Arnold Network *Dominic Karnehm, Antje Neve*

State of Charge Estimation for Lithium-Ion Batteries Based on Rapid

Dynamic Impedance and Time-Frequency Feature Analysis *Wenchao Liu, Zhengxiang Song, Yuhao Pan, Tao Zhang, Le Huan, Jinhao Meng*

Probabilistic Prediction of Li-ion Battery RUL using Large Time-Series

Model *Xiaoyong Zhang, Haotian Luo, Xiaoyang Chen, Wenyu Deng, Heng Li, Weirong Liu*

Beyond Accuracy: Performance Evaluation Considering Testing Data

Volume and Proportions for Photovoltaic Fault Classification *WEIQING LU, Claude DELPHA, Demba Diallo, Anne Migan-Dubois*

Induction motor modeling using modified winding function for fault simulation under variable speeds and loads using regime

normalization *Mahfoud Bouzoudja, Abdenour SOUALHI, Mohamed El Badaoui*

A PSO-Optimized VMD-Transformer Hybrid Model for Lithium-Ion

Battery RUL Prediction *LU ZHANG, Xinghao DU, Demba Diallo, Claude DELPHA, Mohamed Benbouzid*

Cyber-Secured Battery Digital Twin for the Reliable Power Supply of

Modern Telecommunication Networks *Darshan Bhaskarbhai Soni, Masoud Amirrezai Haradasht, Hans D. Schotten, Stefan Goetz*

Synthetic Data Generation for AI-Driven Fault Detection in Wind

Turbines *Elías Rafael Gracia Sosa, FCO JAVIER Rodríguez, Antonio José Jiménez Calvo, Pedro Martín Sánchez, Miguel Tradacete Ágreda, Pablo José Hueros-Barrios*

Design and Performance Evaluation of a Two-Stage 3-Phase 4-Wire

AC-DC for High-Voltage Battery Charging Applications *Kuntal Mandal, Ubaid Ahmad, Javier Corea-Araujo, Abdelali El Aroudi*

A New Approach to Evaluating Aging in Passive Networks of Traction Inverters via Impedance Variation

Quirc Perez-Farre, Luis F Gomez-

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Rivera, Carlos López Torres, Antoni García Espinosa, Alejandro Paredes Camacho

Active Balancing of Parallel-Connected Battery Modules in EV Systems: A DAB-Based Architecture with AUKF-Enhanced SOC Estimation *Guangze Sun, Pengxiang Jing, Dongze Li, Abhisek Ukil, Akshya Swain*

Performance Analysis of Dual Active Bridge-Based Wireless Power Transfer Systems Under Coupling Variations and Non-resonant operation *Afaf Dagher, Jean Sawma, Hadi Kanaan*

Monitoring the degradation of SiC MOSFETs undergoing thermo-mechanical stresses *Margo Molenaar, Aditya Shekhar, Pavol Bauer*

Fast Single-Phase Integrated Battery Charger Based on Open-Winding Motor Drives and Model Predictive Control *Mahdi S. Mousavi, Mokhtar Aly, Alireza Davari, Freddy Flores-Bahamonde, José Rodríguez*

Castilla

S01-I-TT01-1 - Electric Machines and Industrial Drives -I

A Sequential Optimization Strategy for Electric Machines Targeting Torque Ripple Reduction and Energy Efficiency in Industrial Drive Applications *Chiweta Abunike, Ogbonnaya Okoro, Sumeet Aphale*

Derivation of Clarke and mutual inductance coupling factors in (d,q)-reference frame for synchronous machines with several multi-phase winding systems *Niklas Monzen, Johannes Roßmann, Christoph Hackl*

Zero-Sequence Current Mitigation in Open-End Winding PMSM Drives: A Comparative Study *Arda Tüfekçi, Aşkın Özyurt, Ayşe Ahmet Kocabağ*

Fault-tolerant Control of Open-Phase Faults With Non-Sinusoidal Current Patterns in DTP-PMSM Drive Systems *Xingquan Ai, Lan Xiao, Qunfang Wu, Qin Wang, Hao Niu*

Design and Investigation of a Hybrid Axial- and Radial-Flux Permanent Magnet Synchronous Machine *Yongkang Zhang, Jiyao wang, Youkang Hu, Wei Xu, Qiyun Zhang*

Fast Startup Tuning with Motor Type Identification for Induction and Permanent Magnet Machines *Yoshiyasu Takase, Kazuhiro Ohyama, Yasumasa Hamabe, Noor Baloch*

Comprehensive analytical framework for harmonic behavior study of a PMSM under inter-turn short-circuit faults *Gontran Lance, Najla Haje Obeid, Fabien Vidal-Naquet*

A Novel Low-Complexity 6-DoF Magnetic Levitation Linear Motor Design *Koichi Matsuda, Jie Luo*

Selective EMI band suppression based on carrier phase-shifting and uniform Distribution PWM *Jiwen Gong, Dong Jiang, Yuanhao Xie, Hui Liu, Yafei Ma, Hongyang Liu*

Guideline for Simulation of Actuation Systems in Miniature Circuit Breakers *Trung Duong, Jianye Shi, Arda Tueysuez*

Doblon

S07-I-TT11 - Electronic System on Chip and Embedded Systems

Chairs: Tarek Ould-Bachir, Téo Robert

An Embedded PIL Simulation Platform for Real-Time Debugging of a Traction System's Control Software *Iraitz Carretero Caballo, Lander Lejarza*

A 7nm CMOS Anomaly-Detection Deep-Learning Processor with

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Embedded A/D Converters and Pseudo-Image Generation for Sensor Fusion *Takashi Oshima, Keisuke Yamamoto, Seiji Miura, Keita Yamane, Goichi Ono*

Boundary Search-Based Power Budgeting Method for Heterogeneous Systems *Ning Yan, Xin Li, Yilin Han, Yubo Zhang, Xia Dong, Teng Long*

An Edge AI-Enabled UAV System based on FPGA for Water Quality Monitoring with Hyperspectral Imaging *Chun-Hsian Huang, Yu-Chieh Lin, Shu-Ting Huang, Jo-Lin Li, Tsai-Jung Li*

Low-Latency Serial-to-Parallel Conversion for Feedback Shift Registers via Semi-Tensor Product *Fengqiu Liu, Jianmin Wang*

Analysis and Implementation of Dynamic Consensus Algorithms in IoT Sensor Networks for the Secondary Control of DC Microgrids *Alejandro Redondo-Ayala, Gabriel Mujica, Airán Frances*

Accurate Real-Time Simulation of CLLC Converters on FPGA: A Study of Sampling Resolution and Beating Effect *Téo Robert, Tarek Ould-Bachir, Valentin Combet, Mohammed Kenzi, Romain Monthéard*

From PyTorch to CUDA and TensorRT: Optimizing the Deployment of EfficientAD for Real-Time Visual Anomaly Detection *Andrea Quintans Fernandez, Roberto Fernandez-Molanes, Carlos Gonzalez, Juan J. Rodriguez-Andina, José Fariña Rodríguez*

Research on Multi-Core Thermal-Aware Task Scheduling Method Based on Reinforcement Learning *Xia Dong, Xin Li, Teng Long, Yubo Zhang, Yilin Han, Hepeng Wang*

A Digital Twin Approach for Health Conditioning of DC-DC Buck Converter using Analog-Digital Co-simulation *Henil Shah, Anupama Kowli, Mukul Chandorkar*

Segovia

S03-R-TT02-1 - Power Electronics and Energy Conversion

Chairs: Francisco J. Azcondo

Two-three level DAB soft-switching and low current Triple Phase-Shift modulation *Pau Moreno, Macia Capo-Llitas, Daniel Montesinos, Daniel Heredero-Peris*

A Partial-Power-Processing LLC-DAB DC/DC converter with a bridge arm reusing rectifier *Zhaiyi Shen, Kangan Wang, Keke Yang, Min Huang, Zhilei Yao, Weimin Wu*

Model Predictive Control for Zero Voltage Switching in Dual Active Bridge Converters *Ivan Ruiz, Pablo Moreno-Torres Concha*

Defining Operating Ranges for Efficient Magnetic Design in Dual Active Bridge Converters *Nishan Withana, Bishwas Basnet, Prasad Jayathurathnage, Paavo Rasilo, Tomi Roinila*

A Triple Active Bridge-Based Topology for Power Management in Green Hydrogen Production *Giuseppe Bossi, Alfonso Damiano*

Circular Economy R-Strategies for Reliability-Oriented Modular DAB EV Charging with Phase Shedding *Francesca Grazian, Lorenzo Ceccarelli, Riccardo Mandrioli, Ariya Sangwongwanich, Mattia Ricco*

Escudo

S08-I-SSGT-16 - Advanced Motor Drive and Control for High-Performance Robotic Joints

Chairs: Syed Muhammad Nawazish Ali, Daisuke Yashiro

Acoustic Feature-Driven Cross-Domain Fault Diagnosis of Industrial Equipment: An Adaptive Feature Fusion Approach *Shengwei Li,*

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	<i>Zhaoquan Ye, Lin Zhang, Hao Yang, Xiang Wu, Fanghong Guo</i> Concept of Condition Monitoring System for Wind Turbine Drive Trains using Observer and Strain Gauge Bolts Sensors <i>Lars Siepelmeyer, Tim Tölle, Constantinos Sourkounis</i> A YOLOv12-based Framework for Failure Diagnosis in Photovoltaic System Modules <i>Rahmouni Djemaa, Leïla-Hayet Mouss, Mohamed Djamel Mouss, Mohamed Benbouzid</i> Towards interpretable failure detection in induction motors via stray magnetic flux and fuzzy inference <i>Luis Morales Velazquez, Arturo Y. Jaen-Cuellar, Jonathan Cureno-Osornio, Dunai Larisa, Jose Antonino Daviu</i> Dual-Domain Separation Deconvolution Algorithm of Speed Signal for Gear Fault Detection under Variable-Speed Conditions <i>Xu Huang, Jianzhong Zhang, Shuai Xu, Zheng Xu, Ning Wang, Guohua Li</i> Transfer Learning–Driven Offline Diagnosis of Typical Faults in Permanent Magnet Synchronous Motors Using Open–Circuit Back EMFs <i>Saeed Afrandideh, Edmund Marth, Gerd Bramerdorfer</i> Current Sensor Fault Diagnosis Based on Digital Filter and Shallow Neural Network <i>Maciej Skowron, Krystian Teler, Teresa Orłowska-Kowalska</i> Digital Twin-based Bearing Fault Diagnosis Using a 4-DOF Model and Hybrid Deep Learning <i>Habbouche Housseem, YASSINE AMIRAT, Demba Diallo, Mohamed Benbouzid</i> A Digital Twin Approach for Enhancing Early Detection of Rotor Faults in Induction Motor Using Graph Convolutional Network <i>Haraprasad Badajena, Bivash Chakraborty, Aurobinda Routray, Mamata Jenamani, T P Yuvaraj</i> Assessment of Bearing Corrosion in Soft-started Induction Motors Computing the Permutation Entropy <i>Vicente Biot-Monterde, Angela Navarro, Jose E. Ruiz-Sarrio, Jose Antonino Daviu</i> An Improved and Lightweight DeepLabV3+ for Efficient and High-Precision Real-Time Semantic Segmentation <i>Yu Mei, Haifeng Song, Min Zhou, Hairong Dong</i> Effect of Load Variations on Rotor Rotational-related Frequency amplitudes in Induction Motor Current Signals with Eccentricity Faults <i>Citlalli Zamudio, Isaias Cueva-Perez, Vicente Biot-Monterde, Dunai Larisa, Jose Antonino Daviu</i> Optimal Scheduling Method for Virtual Power Plant Considering Electric Vehicle Priority Ranking <i>Yirui Sun, Hongpeng Liu, Ruilu Wang, Fanli Meng</i> Control Mode Detection of Inverter Based Resources in Grid Operations <i>Alexandre Fiset, Zhihua Qu, Kenneth McDonald</i> Decentralized Energy Management for Rural Communities: A Blockchain-Based Virtual Power Plant with AI-Driven Forecasting <i>Daniel Martínez-Calleja, Carlos Santos, Jorge Pérez-Aracil, Cesar Lozano, Matteo Troncia, Imene YAHYAOUI, Carlos Cruz, Raquel Hernández-Marcos</i>
10:20-10:50	Auditorio Opening Ceremony
10:50-11:50	Auditorio Keynote 1 - Research and innovation policies for the green transition in Europe: a huge challenge and a big opportunity During the last years, Europe has declared its will of facing the twin transition

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(green and digital) based on its own principles and considering that both transitions reinforce each other. In order to achieve the 17 Sustainable Development Goals (SDGs) agreed by all the UN countries in 2015, new knowledge, innovative actions are required. New knowledge requires deep research, systemic collaboration and new ways of doing. With this scope and the goal in mind, new R&I actions are required to achieve the de-carbonization of the economy that we foresee: this is a huge challenge. But there is also a big opportunity in it, the opportunity of creating new business based on the deep knowledge and the opportunity to make better territories where this decarbonization occurs. During this talk, the research and innovation policies put in place in the EU program "Horizon Europe 2021-2027" as well as those at Spanish level will be described and analyzed to understand how this huge challenge becomes a big opportunity.

Dr. Teresa Riesgo holds a PhD in Electronic Engineering from the Technical University of Madrid, where she has been Full Professor of Electronics from 2003 to 2018. From 2018 to 2020 she was Director General of R&D&I of the Spanish Ministry of Science, Innovation and Universities and since 2020 she is the Secretary General of Innovation of the Spanish Government. While being at the University, she was an active researcher in industrial electronics, mainly in embedded systems design.

10:50-12:50

Escorial

S88-I-SS18 - Aerial Manipulation Systems in Dynamic Environments: Intelligent Modeling, Planning, and Control

Chairs: Yipeng Yang, Zhitai Liu

A Hierarchical Reinforcement Learning Method in Multi-UAV Target-Attacker-Defender Games *Xilun Li, Xubin Zhou, Yipeng Yang, Zhan Li*

A Formation Reconfiguration Mechanism for Aerial Cable Towed Systems against Thrust Loss *Xu Lidan, Bin Yang, Taihang Chen, Jianzhong Qiao, Dong Zhao*

Hierarchical Heuristic for Large-Scale Automatic Optical Inspection Route Scheduling Based on Neighborhood Search *Junhu Cao, Guangyu Lu, Qiqi Pi, Baoqing Yin, Jinyong Yu, Zhitai Liu*

Integral Sliding Mode Observer-Based Adaptive Output Feedback Control for PMLSMs *Zhongjin Zhang, Zhitai Liu, Weiyang Lin, Mengmeng Hu, Changlin Wen*

Attitude Tracking and Vibration Suppression During Flexible Spacecraft Maneuver under Input Nonlinearities and Measurement Errors *Umair Javaid, Michael Basin, Salman Ijaz*

Cooperative Task Assignment of Multi-FW-UAV System Using Adaptive Genetic Algorithm for Maritime Rescue Operations *Umair Javaid, Muhammad Imran Baig, Sami Shahid, Michael Basin*

A Simulation-based Pipeline for Data Generation and Validation in Learning-Based Visual Servoing *Yang Liu, Haoyu Zhang, Weiyang Lin, Chao Ye*

A Prescribed-Time Disturbance Estimation Method for Aerial Manipulator System *Jianwei Ma, Yipeng Yang, Sichen Yang, Jinhui Liu, Huanchen Yao, Zhan Li*

Adaptive Backstepping Sliding Mode Attitude Control for Aerial Manipulator under Variable Load and Disturbance Uncertainties *Liu*

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	<i>Yang, Wenchao Tian, Junhui Zhang</i> Non-local Feature Fusion and Mixed Multi-Metric Learning Enhanced Sketch-based Image Retrieval <i>Nannan Liu, Zhiming Zheng</i> Trajectory Optimization for Multi Operator 5G-Enabled UAVs in Urban Environments <i>CELSO BUIAR, Marcelo Pellenz, Marco Teixeira</i> Generalizable Height Estimation from Single Aerial Images across Datasets <i>Nannan Liu</i> El Jardin IES TC Meetings Galeria S90-R-TT16 - Mechatronics and Robotics Chairs: Taro Nakamura, Kosuke Shikata Camera-based Online Torque Estimation of a Multi-link Pendulum via Extended Kalman Filtering <i>Haydar Karhan, Zafer Bingul</i> Compensation of the Transmission Errors in Electrically Preloaded Rack-and-Pinion Drives <i>Lukas Steinle, Valentin Leipe, Armin Lechler, Alexander Verl</i> A Temperature-Dependent Proportional Valve Model of a Hydraulically Actuated Tower Crane <i>Tim Boye, Oliver Sawodny</i> Adaptive Super-Twisting Sliding Mode Impedance Control for Cooperative Multi-Robot Manipulation <i>Lucas Wan, Ya-Jun Pan</i> Proposal of a Multi-Flexible Wheel Robot Equipped with a Meridional Rotational Mechanism for Locomotion in Confined Spaces with Non-Circular Cross-Sections <i>Yuki Ono, Yosuke Monma, Fumio Ito, Taro Nakamura</i> A Dual Calibration Framework for Exploring Environments using Heterogeneous Robot Swarms <i>Yun GAO, Hao Gao, Yang Shi, Jinni Zhou, Yiding Ji</i> Multi-Sensor SLAM in Smart Factories: A Comparative Study on LiDAR and Visual Techniques using the ROS2 framework <i>Krithiga Ramesh, Maxim Friesen, Lukasz Wisniewski, Tullio Facchinetti</i> Quasi-Real-Time Motion Control via Measured Sampling Periods <i>Kosuke Shikata, Seiichiro Katsura</i>
11:20-12:50	Toledo Industry Panel: EMTP Presentations: - Jean Mahseredjian: Numerical methods for modern grids with IBRs - Willy Nzale: E-interconnect: Validating renewable EMT models for grid code compliance - Henry Gras: Roadmap for integrating EMT models into system planning - Amro Alsabbagh: Translating phasor-domain network models into the EMT domain
11:50-12:50	Auditorio Keynote 2 - Powering Industry 5.0: Harnessing AI, Edge Computing, and IoT with Arm-based Technologies The confluence of AI, robotics, IoT and human creativity and imagination is transforming industry, and the way humans live, work, and collaborate with

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	machines. This keynote will present the foundational technologies at the heart of this transformation, demonstrate several exciting use cases of Industry 5.0, and outline further opportunities lying ahead. The keynote will also present challenges Industry 5.0 faces, including compute and power/energy scalability, security, privacy, and sustainability, and ways in which Arm and its ecosystem partners are addressing these. Dr. Khaled Benkrid has 25+ years' experience in higher education teaching, research, and policy development. Prior to joining Arm Ltd in 2013, he was a UK-based academic for 13 years, teaching, researching, and leading in various areas of computer science and electronics engineering, particularly in high-performance embedded computing and electronic design automation. Khaled supervised 15+ successful PhD research projects during his academic career and co/authored 100+ publications in major international conferences and journals. He is now Visiting Professor at the School of Computing and Information Science, Anglia Ruskin University, UK. During his tenure at Arm, Dr. Benkrid set up the global Arm University Program, the Arm School Program, Arm Education Media, and the Semiconductor Education Alliance. Together, these programs are educating and training hundreds of thousands of students globally every year, bridging the education, research, and skills gaps in computer engineering and STEM, and equipping the next generation of engineers for the challenges and opportunities of the modern economy, especially with the rise of generative AI.
12:50-15:30	Tapices WIE luncheon
14:10-16:10	Escorial S13-I-TT14-1 - Control Systems and Applications Chairs: Yanming Zhou, Fernanda Carnielutti Stability Margins of Disturbance Observer: Addressing Uncertainty and Time Delay in Line-of-Sight Stabilization Systems <i>Jiuqiang Deng, Qianwen Duan, Yao Mao, Qiliang Bao</i> Stability analysis for delayed neural networks based on a delay-interval-adjustable-based method <i>Xukang Chang, Yong HE</i> Multi-Scale Feature-Probability Consistency for Domain Concept Drift Detection in Non-Stationary Industrial Fault Diagnosis <i>Penglong Lian, Junlin Song, Jiyang Zhang, Jianxiao Zou, Shicai Fan</i> Active Disturbance Rejection Control of the Motors of a Mobile Robot with Hardware Induced Delay <i>Alberto Cerro-Sánchez, Luis Mérida-Calvo, Vicente Feliu-Batlle</i> Hardware and Software Co-Design for Accelerating Model Predictive Control on Heterogeneous Compute Systems <i>Marco Guerreiro, Marco Groß, Steven Liu</i> A Neural Network-Based Model for Real-Time Prediction of Infectious Disease Dynamics <i>samira asadi, Amirabbas Hadizade, MEHRDAD MOALLEM</i> Automatic Recovery Planning and Execution Architecture for IEC 61131-3 Controlled Machinery <i>Sebastiano Gaiardelli, Jan Wilch, Franco Fummi, Birgit Vogel-Heuser</i> Predictive Model-Assisted Iterative Learning Control for Suppressing Unknown Periodic Disturbances <i>AIJING WU, Xin Huo, Qingquan Liu, Linrui Wang</i>

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Image Stabilization Incorporated Visual Simultaneous Localization and Mapping for Humanoid Robot Navigation *Huei-Yung Lin, Kai-Chen Kang*
Disturbance-Learning-Based Attitude Maneuvering Control for Spacecraft Under Strong Composite Disturbances *Hao Teng, Jiaao Wu, Yixuan Zhang, Qiang Xu, Dong Zhao*
Energy-Efficient Controller Design for Autonomous Aerial Systems Using Scalar Error Function *Umair Javaid, Michael Basin, Zhihui He, Yuanjiang Liao*
Fault-Tolerant Approximated Inverse Control for Fractional-Order Nonlinear Hysteretic System *Pukun Lu, Jinjun Shan*
Event-Based Photometric Gaussian Mixture Models for Visual Servoing *Gu Gong, Qiang Wang, Zhen He, David Navarro-Alarcon*

Hidalgo

S10-I-TT02-2 - Power Electronics and Energy Conversion III

Minimizing Circulating Current in Active Bridge Multilevel Converter Using HFL Analysis *Morteza Dezhbord, Martin Votava, Carlo Cecati, Marco Liserre*
Triple-Active Bridge Based Architecture for Power Unbalance Mitigation in MMC-PV Systems *Vivek P V, Anshuman Shukla, S. V. Kulkarni*
Symmetric and Asymmetric Switched-Capacitor Multilevel Inverter Topology with Reduced Components *Ahmed Awadelseed, Arkadiusz Lewicki, Haitham Abu-Rub, Ali Sharida*
Open-Loop Paralleling of Class E2 resonant DC-DC Converters *Ansley Jugoo, Florentin Salomez, Sébastien Carcouet, Bruno ALLARD, Yves Lembeye*
Magnetic Coupling Integration Method in Hybrid IPT Charger Featuring Constant Output Power and Soft Switching in Wide Misalignment Range *Armin Gheysari, Ali Yazdian Varjani, Amir Babaki, Thomas Ebel*
Leakage Inductance Model of Split-Bobbin Integrated Transformers for Resonant Converters *Joshua Rauber Neusser, Richard Schlesinger, Cristiano Facco, Maikel Fernando Menke, Marco Dalla Costa*
Artificial-Neural-Network Optimized Triple-Active-Bridge Converter Minimizing Total Semiconductor Losses *Tarek Younis, Fahad Al-Ismaail, S.M. Suhail Hussain*
Optimal Triple-Phase Shift Modulation for Half Bridge Based Dual-Active-Bridge Converters *Marina Vitali, Andrea Cervone*
Magnetic Control of LLC Resonant Converter for Electric Mobility Applications *Sarah Saeed, Valter S. Costa, Pablo Quintana, Jorge García, Marina Perdigão*
Control of Three-Phase Nine-Leg STATCOM generating positive and zero-sequence component *František Iška, Tomáš Komrská*
Design Considerations for Single-Stage Current Source Inverters with Discharge Path with Surface-Mounted PMSMs *Dario Benatti, Giovanni Migliazza, Emilio Carfagna, Fabio Immovilli, Emilio Lorenzani*
Performance Evaluation of a Low-Loss PWM Method in Single-Stage Motor Drives *Syed Jahania Shah, Hafsa Qamar*
The Effect of Y-Capacitor Insertion at the Inverter Input on the Radiated EMI Analysis with a Load Open and Connected *Fumiya Ohashi, Sari Maekawa*
Cascaded H-Bridge Converter-Based PMSM Drive: PS-PWM and LS-PWM Modulation Comparison *Paul Adamu, Daniel Legrand Mon Nzongo,*

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Chunyan Lai, Animesh Anik, K. Lakshmi Varaha Iyer

Single-DC-Source Three-Phase Six-Level Topology Based on Flying Capacitor Converter *Javad Ebrahimi, Suzan Eren, Alireza Bakhshaei*

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S14-I-SSGT-8 - Innovations in Power Conversion, Energy Management, and System Safety

Electric Vehicle Onboard Charger EMI Analysis *Qinghui Huang, YIRUI YANG, Yanwen Lai, Mohamed Elshaer, SHUO WANG*

Battery Health and Shifting-Aware Gear Ratio Optimization for Distributed Drive Electric Trucks *Shaokun Li, Zhiwu Huang, Yue Wu, Xiaoyong Zhang*

High Power Density Multiphase Coil Architecture with Integrated Filter Inductance for Wireless Power Transfer Systems *Pedro Alvarez Vega, Felix Rojas*

Building Fire Detection Based on Neural Network with Data Optimization and Algorithm Comparison *Yinghao Gan, Jiguang Chen, Ting Shao, zhangweiqi zhang*

Design of Building Fire Information Processing and Early-Warning System Based on Weighted Estimation and Multi-Model Fusion *Yinghao Gan, Jiguang Chen, Ting Shao*

Simulation of Intelligent Fire Protection System for Buildings and Spatial Visual Evacuation Design *Beibei Li, Yunyi Wu, Julian Lai*

Construction of Fault Lexicon for Electrical Test Systems Based on Knowledge Graphs *Yanmin Wang, Jiaming Wang, Zhihong Zhang, Dundun Liu*

Magnetic levitation vibration isolation platform based on sliding mode control *He Zhang, Haoran Cai, Yuexuan Lou, Baoquan Kou, Yuhang Liu*

Design of an Indoor Illuminance Analysis and Prediction System for Buildings Based on Neural Network Algorithms *Beibei Li, Yunyi Wu, Julian Lai*

Prediction-Enhanced Soft Actor-Critic for Optimal Energy Management of Electric Vehicles *Heng Li, Yulin Zhang, Yuxuan Cai, Yue Wu*

Switching Control of Off-Grid/Grid-Connected Modes in Grid-forming PV-Storage Systems Based on VSG *Yanmin Wang, Qiuying Zhou, Wenwen Xiong, Juan Yu, Miao Miao*

Analysis of Safety and Power Supply Capability for DC Low-Voltage Distribution Systems *Wei Li, Guangxi Li, Kele Ni, Dongxu Li, Wenwen Xiong, Juan Yu, Miao Miao*

A Constant Frequency Four-Switch Buck-Boost Converter with Current Programmable Control and Seamless Mode Transitions.. *Shaik*

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Shafia Sulthana Taj, Naga Brahmendra Yadav Gorla, Ramesh Kankanala
A Modified PV to Virtual Bus Parallel Differential Power Processing Architecture for Photovoltaic Systems *Dimitris Karousos, Afshin Nazer, Shamsodin Taheri, Hani Vahedi*

Castilla

S09-I-TT02-1 - Power Electronics and Energy Conversion

Dual-Bipolar Modular AC-AC Converter for Frequency Conversion in Low Frequency Transmission Applications *Haoran Yi, Fujin Deng, huailong li, Yaqian Zhang*

Continuous-Control-Set Model-Free Predictive Control for DC-DC Converters with Runge-Kutta-Based Ultra-Local Data-Model *Zheng Yin, Fujin Deng, Yeyuan Xie, Sayed Abulanwar, huailong li, Mingzhen Yang, Haoran Yi, Sergio Vazquez*

Rethinking Carrier-based Common-mode Voltage Mitigation and Capacitor Voltage Balancing in Three-level NPC Converters *Wei Xu, Jun Wang, Wenzhi Zhou, Xibo Yuan*

Harmonic State Space Model Analysis of Thyristor-Controlled LC Voltage Source Converters *Haoyu Zhang, Manchung Wong*

A Clamped Resonant DC/DC Boost Converter and its Wide Adjustable Input Voltage Range Design for Photovoltaic Medium Voltage DC Collection *Yulong Wang, Binbin Li, Yingzong Jiao, Zhiyuan Wang, Dianguo XU*

Inter-Cluster Energy Balancing Using Instantaneous Power Theory in Delta-Connected Cascaded H-Bridge Converters *José Ignacio Gajardo, Javier Pereda, Pablo Poblete, Ricardo Aguilera, Felix Rojas, Diego Verdugo*
Flyback Converter EMI Modeling and Reduction Survey *Juntao Yao, SHUO WANG*

Experimental Evaluation of EMI and Efficiency in a Hybrid T-Type Wide-Bandgap Converter *David Lumbreras, Jordi Zaragoza, Néstor Berbel, Luis Romeral*

Comprehensive Optimization of ISOP-based Dual-Active-Bridge Converter Under Zero-Common-Mode Modulation *Zhenyu Wang, Dong Jiang, Xuan Zhao, Wei Sun*

Low THD and Harmonic-optimized Nine-level modulation strategy for ANPC/H-bridge Converter *Yiming Sun, chengming Zhang, Zihao Zhu, Qingwei Zheng, Mingyi Wang, Liyi Li*

Modeling of Asymmetric Charge-Controlled LLC Converters

Considering Ramp Compensation *Qingyuan Xu, Tengran Ma, Xiangkai Shi, Daorong Lu, Haibing Hu*

A coordinate LVRT control for High-Frequency Link Matrix Converters with enhanced efficiency *yunqing hu, Fujin Deng, Sayed Abulanwar, Abdelhady Ghanem*

A Simplified Model Based Predictive Control Strategy for ANPC Converters using Sequential Optimization for Reactive Power

Compensation *Matias Aguilar, Juan Arnaldo Insfran Ferreira, Alfredo Renault, Leonardo Comparatore, Julio Pacher, Osvaldo Gonzalez, Marco Rivera, Patrick Wheeler*

AC Voltage Optimization Method for Bipolar TBL-HMMC HVDC

Systems under DC Fault Protection *Mingzhen Yang, fujing Deng, zijian Zhu, huailong li*

Improved LCC Topology for Multi-Frequency Wireless Power Transfer System with Constant-Voltage Under Coupling and Load

Variations *Hongliang Pang, Wei LIU, Xiaotian Xie, Chang Liu, Tianyi Liu, K.T. Chau*

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S15-I-TT10 - CPS and IoT in Industry

Chairs: Claudia-Melania Chituc, Jorge Portilla

- A Convolutional Neural Network Model with Multi-head Attention for DDoS Detection in 5G Networks** *Íris Viana dos Santos Santana, Álvaro Sobrinho, Leandro Dias da Silva, Danilo F. S. Santos, Angelo Perkusich*
- Analysis of hybrid application of neural network algorithms and expert rules for detecting anomaly condition of turbine units** *Fedor Mitin, Artem Popov*
- Benchmarking Digital Twins for Tower Cranes: Isaac Sim vs. Gazebo** *Juliana dos Santos, Murilo Bicho, Tony Froes, Gabriel Dorneles, Silvia Botelho, Eder Mateus Gonçalves, Marcelo Pias*
- Multivariate Time Series Anomaly Detection in Cyber-Physical Systems Using Sparse Attention** *Yuhao Li, Jiajun Gui, Duanjin Zhang*
- Secure Medical IoT Networks Using Blockchain and Post-Quantum Cryptography** *Jorge Señor, Jaime Señor, Jorge Portilla*
- Adapting IEC 62443 for Steganographic Threat Detection in ICS Environments** *Natasha Edeh, Esin Öztürk, Karl Waedt*
- EdgeFL-HW: A Hardware-Aware Federated Learning Framework for Resource-Constrained Heterogeneous Devices in Industrial Networks** *xiying li, Changqing Xia, Chuazhi Zang*
- Digital Twin for Network and Industrial Operation** *Alessia Tarozzi, Mahin Ahmed, Hans-Peter Bernhard, Roberto Verdone*
- Intelligent Slab Temperature Sensing for Hot Rolling: An Integrated Model Based Method** *Yifan Zhang, Tiankai Jin, Shigeng Wang, Xiaojing Wen, Cailian Chen, Xinping Guan*
- Towards Transformation of Formal Descriptions into SMT Models for Modular Plant Configurations** *Michael Winter, Bowen Chen, Tobias Kleinert*
- A Deterministic Event-Driven Software Bus for Virtualized Industrial Edge Applications** *Bintao Yu, Shang Gao, xinkai zhang, Wenbin Dai*
- Learning Beyond Labels: Self-Supervised Methods for Anomaly Detection in Cyber-Physical Systems** *Swagat Das, Devin Drake, Harindra Sandun Mavikumbure, Victor Cobilean, Milos Manic*

Segovia

S11-R-SS49 - The Responsible Practice of Generative Artificial Intelligence for Industrial Applications and Systems

Chairs: Daswin De Silva, Chamod Samarajeewa

- Multi-modal Hierarchical Diffusion Model for Robust and Realistic Trajectory Generation** *Harindu Udage Kankanange, Dimuthu Kariyawasan, Nimeshika Hewa Dehigahawatta, Nilushika Hewa Dehigahawatta, Oshada Jayasinghe, Vidura Sumanasena*
- GAN-Driven Signal Denoising and Enhancement for Robust Drone Motor Detection** *Dilshara Herath, Chinthaka Abeyrathne, Supun Ganegoda, Chatura Seneviratne, Harindra Sandun Mavikumbure*
- ReACT - Gen AI Agents for Reasoning, Planning, and Testing in IEC 61499-Based Control Systems** *Midhun Xavier, Sandeep Patil, Chen-Wei Yang, Valeriy Vyatkin*
- AI-Driven Smart Ultra-Fast EV Charging Stations Using Single-Inductor MIMO Converter: A Grid-Stable and Energy-Efficient Solution** *Mojtaba Hajihosseini, Hossein Ghasemisahebi, Ali Reza Sattarzadeh, Saman Asghari Gorji*

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Reasoning-Driven Anomaly Detection for Skin Disease Diagnosis via Chain of Vision *Duy Truong, Thien Huynh, Vidura Sumanasena*
Generative AI Assistant for Netlist Generation and Smart Component Suggestion Using Knowledge Graphs and Retrieval Augmented Generation *MUSHA AHAMED R Y, Nithish Kumar VC, Ashwin Singh S, Navajyothi KP, Yuwan B S, Chanuka Wijayakoon*
Generative AI Agents for Hyper Predictive Maintenance of Solar Energy Systems *Dilantha Haputhanthri, Chamod Samarajeewa, Daswin de Silva, Milos Manic, Nishan Mills, Harsha Moraliyage, Andrew Jennings*
AI-Driven Assistant for Optimal Design of Two-Level Three-Phase Voltage Source Inverters *Virginia Negri, Francesco Bazzani, Alessandro Mingotti, Riccardo Mandrioli*

Escudo

S16-I-SSGT-17 - Data-Driven Optimization and Control for Modern Power Systems and Energy Markets

Linking Behavioral Patterns to Energy Use: A Profile" Based Approach for Enhancing Consumption Flexibility *Carlos Cruz, Carlos Santos, Felipe Espinosa, Marcos Tostado-Véliz, Ignacio Bravo*

Multiobjective Optimization of Blackstart in Distribution Systems Using Genetic Algorithm Considering ENS and System Recovery Time *Lucas Freire Santos Azeredo, Imene YAHYAOU, Jussara Farias Fardin, Helder Roberto de Oliveira Rocha*

Assessing the Impact of Ground-Based Cloud Observations on Photovoltaic Generation Forecast *Mario Albanese, Daniele Carta, Ulrich Lohnert, Andrea Benigni*

Harmonizing Energy Markets and Ancillary Services in Europe: A Comprehensive Review of the Unification Projects *Javier Cardo Miota, Emilio Pérez, Hector Beltran*

The cost of privacy in local energy markets: Auction vs. central mechanisms *Khaled Abedrabbah, Luluwah Al-Fagih*

Load Frequency Control Strategy for Power Systems Integrated with Electric Vehicles and PV Systems *Abdelkader Halmous, Hossam Eddine Aymane ABBOU, Youcef Oubbati, Mohamed Lahdeb, Salem ARIF, Mohamed Trabelsi*

Multi-Objective EV Aggregator Profit and Voltage Deviation Optimization in Day-ahead Market *Abu Zar, Syed Muhammad Nawazish Ali, Ali MORADIAMANI, Mahdi Jalili*

Optimal Operation of Multi-Energy Microgrids with Attention-Boosted Multi-Agent Reinforcement Learning *Yinghao Wang, Wang Lei, Fanghong Guo, Hongye Su*

CPP-GNN: A Temporal Hypergraph Neural Network for Carbon Price Prediction in Electricity Market *Renbo Zhang, Xilin Dai, Hua Wang*

Energy Management Strategies and Hybrid Fuel Cell-Powered Autonomous Underwater Vehicles: A Comparative Study *Youcef Belkhier, Clemens Deutsch, Haroon Rashid, Emmanuel Delaleau, Gang Yao, Abdeslam Mamoune, Mohamed Benbouzid*

GAF-CNN-LSTM Hybrid Model for Power Load Forecasting in Non-Stationary Grids *Qianyuan Dong, Jinglin Liu*

Machine Learning Forecasting and GAN-Based Scenario Control for EV Charging and PV Integration *Fatemeh Nasr Esfahani, Neeraj Suri, Xiandong Ma*

Low-Model-Dependency Adaptive Droop Control for Islanded DCMGs Using EKF Estimation and Fuzzy Logic Damping *Abd Alelah Derbas, Chiara Bordin, Sambeet Mishra, Frede Blaabjerg*

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	Hybrid Modelling and Limit Cycle Control of an Interleaved Synchronous Buck Converter <i>Mohamed Benmiloud, Khaled Rayane, Atallah Benalia, Mohamed Trabelsi</i> Enhanced Frequency Regulation in Low-Inertia Microgrids Using PID-Based Virtual Rotor Control with EV and DR Support <i>Hossam Eddine Aymane ABBOU, Abdelkader Halmous, Mohammed Benzoubir, Abdelmoumene Delassi, Salem Arif, Luiza Santos, Mohamed Trabelsi</i>
16:30-18:30	Escorial S22-I-TT14-2 - Control Systems and Applications Chairs: Jinjun Shan, Michael Basin Improved delay-set-partitioning-based stability analysis for delayed T-S fuzzy systems <i>Zhou-Zhou Liu, Li Jin, Yong HE</i> Divide-and-Conquer Multi Agent Path Finding for Fast Facility Layout Optimization <i>Shunichiro Sugiyama, Hiroyuki Okuda, Tatsuya Suzuki</i> Novel Adaptive Super-Twisting Observer-Controller Framework with Input Constraints <i>VSS Sri Krishna TelikicherlaKandalai, Jishnu Keshavan</i> A Robust Dynamic Output Feedback Control for a Class of Uncertain Switched Affine Systems <i>Haruto Takahashi, Hayate Sawato, Kouki Shibuya, Takuma Kawakami, Yoshikatsu Hoshi, Hidetoshi Oya</i> Fault Estimation for Polynomial Fuzzy Systems with Unmeasurable Premise Variables and Its Application to Bridge Crane System <i>Jingyu Ding, Siyang Zhao, Jinyong Yu, Michael Basin, Mariusz Malinowski</i> Adaptive Robust Preview Formation Controllers for Uncertain Discrete-Time Multi-Agent Systems <i>Kouki Shibuya, Hayate Sawato, Hidetoshi Oya</i> Adaptive Distributed Model Predictive Contouring Control for Path Following of Unmanned Surface Vessels <i>YANMING ZHOU, Huiping Li, Qifan Yang, junlong liao</i> A Composite Nonlinear Fault Tolerant Control Scheme for Octorotor UAV System <i>Umair Javaid, Salman Ijaz, Zainab Akhtar, Michael Basin</i> Sync-A: A Xilinx Aurora-Based Interface IP with Sub-nanosecond Synchronization Error Timing Distribution Capability for Large-Scale High-Frequency Modular Power Converters <i>Mingze Gao, Vladimir Mitrovic, Rolando Burgos, babak fahimi</i> ADRC-Based Quadrotor Guidance for Three-Dimensional Target Interception <i>Zakaria MEHAL, Mohamed Guiatni, Yasser BOUZID, Sidali REKIA</i> Unscented Kalman Filter for Leader-Follower Target Tracking Control of Multi-Agent Systems <i>Sanila P, Jeevamma Jacob, Rijil Ramchand</i> Synthesis of Decentralized Variable Gain Robust Model-Following Controllers Giving Consideration to Transient Behavior for Uncertain Large-Scale Serially Connected Systems via Piecewise Lyapunov Functions <i>Hayate Sawato, Kouki Shibuya, Haruto Takahashi, Takuma Kawakami, Yoshikatsu Hoshi, Hidetoshi Oya</i> Optimized Footstep-based Energy Harvesting Approach using Node Distribution and LTC3588 Nanopower Interface for Efficient Battery Charging <i>Fatma Abou Elhassan, Dania Abdelsamie, Remya Nair, Kareem Maree, Zainab Abou Elhassan, Mohamed Trabelsi, Nader Shehata</i> Hidalgo S18-I-TT03-1 - Power Systems and Smart Grid Chairs: Kristian Klumpner A Switching Method for Seamless Transitions Between Grid-Following

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and Grid-Forming Control Without Inner Current Loop zhiyu zhang, Jianan Yan, Xiaojie Shi, Zhiqiang Wang, Lei Lin

Design and Implementation of Highly Reliable SSCB for EMP Power Distribution Systems QingGuang Xia, Jin Wu, Nan Wu, Xueyan Zhang, Junxin Fan, Xiaoke Sun

Model Predictive Control-based Grid Forming Control for AC Shipboards Microgrids Pedro Catalán, IVAN MARTINEZ, IÑIGO REBOLLO, CARLOS RUIZ

Modulation-Based Modeling of Arc Fault Electromagnetic Radiation for Robust Feature Extraction Ratnakar Nutenki, Aurobinda Routray, Ashok Kumar Pradhan, Haraprasad Badajena, Bivash Chakraborty

A practical implementation of an n-th Harmonic mitigation for SCIM drives Fahimeh Shiravani, Ivan Martinez, Pedro Catalán

Multi-Horizon Power Transmission Forecasting with Future-Known Inputs and Trends Jaeseok Yoo, Young-jin Oh

Coordinated Optimization of Geothermal-solar-wind Multi-energy Microgrid Considering Energy Quality Hongjia Li, Ziyi Bai, Man Chung WONG, Da Xu, Ningrui Yang, Zhen Zhu

Optimization of Power Processing in Two-Leg Interleaved Converters to Improve System Efficiency Eduard Martínez, Fabrício Hoff Dupont, Jordi Zaragoza, Manuel Lamich, Néstor Berbel, Gabriel Capellà

Intelligent Day-Ahead Scheduling of Bidirectional EV Charging for Economic and Grid Performance Enhancement Youssra Lahrarti, Hamid Ouadi, Nada Mounir, ISMAEL JRHILIFA, Saida Elbakali

A Comparative Study on Neural Network Architectures for DC Optimal Power Flow Mamoun Lyes Hennache, Maad Alowaifeer

A Decentralized Algorithm for Economic Dispatch Mohammad Jahvani, Martin Guay

Evaluating Microgrid Autonomy and Load Support under Islanded Conditions: CampusGrid Case Study Luiza Higino S. Santos, Hercules Oliveira, Jéssica A. A. Silva, Marcos J. Rider, Luiz Carlos P. da Silva, Lucas de P. A. Pinheiro

Investigating the Energy Storage Requirements for a Distributed STACOM for Voltage Regulation in Weak Low Voltage Distribution Grids with Significant Photovoltaic Generation Christian Klumpner, Siti Husna Anuar

Resilient Decentralized Frequency Regulation for Multi-Area Power Systems under DoS Attack Yue Long, Liu Qi-Dong, Tieshan Li, Jian Li

Coordinated Fast Frequency Regulation in Dynamic Virtual Power Plants via Disturbance Estimation SAIF AHMAD, Seifeddine BENELGHALI, Hafiz Ahmed

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S20-R-TT02-2 - Power Electronics and Energy Conversion

Chairs: Tripura Pidikiti

Decentralized Control of the Decoupled Modular Multi-Active-Bridge Converters for Modular Scalability Chengwei Liu, Kai Sun, Di Mou, Adrià Junyent-Ferré

Unified Control Scheme of the Interlink Converter for Multi-voltage Level DC Distribution Systems Chengwei Liu, Vardan Saxena, Adrià Junyent Ferré, Yitong Li, Kai Sun

Operation Principle of T-Type Transformerless Modular Multilevel DC-DC Converters Under Quasi-Square Wave Modulation for HVDC Grids yipeng su, Hao Zhang, Ke Cheng, Heya Yang, Xin Xiang, Chushan

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Li, Wuhua Li, Xiangning He

Multi-CV-Output Domino Wireless Power Transfer System With Reconfigurable Voltage Levels *Yilin Zhang, Haoyuan Xiao, Bowang ZHANG, Yangyang Chen, Junyu Fan, Wei Han*

Reference Current Saturation Methods for Modular Multilevel Converters in HVDC Systems *Leonardo Testa, Petros Karamanakos, Christoph Hackl*

A Hybrid Observer Approach for Cell Voltage Estimation in Modular Multilevel Converters *Oliver Kalmbach, Stephan Trenn, Christoph Hackl*

Global Zero-Vector Substitution Current Balancing Control for a 19kA Multilevel CSC in Hydrogen Electrolysis *Tianji Zhou, Biao Zhao, Bin Cui, Tianyu Qiu, Yantao Lou, Xiaoping Sun*

A Programmable Low-Voltage GaN Switching Cell with an Electronic Fuse to build Modular and Scalable Multilevel Power Converters *Marti Puigpey, Joan Nicolás-Apruzzese, Gabriel Garcia-Rojas, Sergio Busquets-Monge, Germán Fañanás-Puigjaner, Fabio Bernardi*

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S23-I-SSGT-10 - Innovations in Electromechanical Drives, Motion Control, and Power Components

Chairs: Chao Gong

A Brushless Resonant Exciter Concept for Radial Flux Motors *Sam Dobbelaere, Peter Sergeant, Hendrik Vansompel*

Automated Drifting for 4WD Vehicles: Analysis, Controller and Experiment *Sheng Zhao, Zhouhang Yu, Liang Yan, Hangyu Lu, Xiaodong Wu*

Multi-Material Topology Optimization for IPM Machine with Efficient Rare-Earth PM Utilization *Mohamed Reda Mahmoud, Mohamed Ibrahim, Peter Sergeant*

Lifetime-aware nonlinear model predictive speed control for electric vehicle power converters *Umberto Montanaro, Francesco Accettura, Bo Wang, Carmine Caponio, Pietro Stano, Davide Tavernini, Patrick Gruber, Yinglong He, Vishwas Kulkarni, Gianluca Mastroiello, Raffaele Carli, Mariagrazia Dotoli*

Global/Local Performance Analysis of Driving Force Based Hierarchical Decentralized Motion Control System for Multi-Motor Vehicles *Nguyen Binh Minh, Antonio Tota, Hiroshi Fujimoto, Aldo Sorniotti, Shinji Hara*

On the benefit of direct wheel torque control for longitudinal comfort enhancement on uneven roads *Davide Lazzarini, Antonio Tota, Aldo Sorniotti*

Driving Force Control with Average-Differential-Coordinate-Based Slip Ratio Control for Left-Right-Wheel-Independent-Drive Electrified Vehicles *Hiroyuki Fuse, Hiroshi Fujimoto, Naoki Takahashi, Ryota Takahashi, Takayuki Hayashi, Kaoru Sawase*

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Active Thermal Control optimization and evaluation with detailed simulation and different lifetime models *Maciej Brzycki, Nimananda Sharma, Linhua Lai, Artem Rodionov, Yujing Liu*

Evaluating and comparison of mechanical and solid-state contactors for aviation battery systems *Eymen Ipek, Elena Blazhevskaya, Guenter Prochart*

Thermal Profiling of Next-Generation Solid-State Batteries for Advanced Automotive Battery Management Systems *Chandan Chetri, Alvin Huynh, Sheldon Williamson*

Equivalent Circuit Parameterization from Electrochemical Impedance Spectroscopy Data for Accurate Battery Degradation Prediction using Convolution Neural Network *Latha Anekal, Chandan Chetri, Meaghan Charest-Finn, Sheldon Williamson*

Techno-Economic Analysis of Grid Connected, Solar and Wind Power Generation based EV Charging Station *Fareed Ahmad, ATIF IQBAL*

Schottky diamond diodes in switching operation: a new step towards the future of power electronics *Alexandre Battiston, Juliette Letellier, Matthieu Landel, Elliott Cornes*

Design and Analysis of MIMO Coil Based Dynamic Wireless Charging System for Electric Vehicle *ZHISHEN LUO, Junyu Fan, Bowang ZHANG, Wei Han*

Physics-Based Hybrid Analytical Empirical Model for GaN-HEMT Incorporating Dynamic Drift Velocity, Nonlinear Parasitics, and Thermal Feedback *Kundan Kumar, VIKRAM KUMAR SAXENA, Benjamin A Shimray, Vima Mali, Sanjeet Kumar Dwivedi*

Castilla

S17-I-TT02-3 - Power Electronics and Energy Conversion

Chairs: Alberto Pigazo

Research on Transient Synchronization of Wind Turbines Based on the Analysis of Phase - Locked Loop Damping Ratio and the Improved Voltage Normalization Control Strategy *yang yuheng, Zekang XIAO, Qihui Liu, Xipeng Cai, Yihua Zhu, Chao Luo, Xueshen Cui*

Novel Carrier Phase Shift Control of MMC for DC Transmission System *Dan Zhang, Suijun Xiao, Minglong Zhang, Yilian ZHANG*

Research on A Composite Hydrogen Production Power Supply Based on PV-Storage *Yan Li, Jing Deng, MingJun Ke, Yucheng Deng*

Design of Magnetic Coupling Mechanism for WPT System Based on Fractal Geometry *Zhiying Zheng, Zhihao Ye, Cheng Chen, Jiatong Li, Xiyu Gao, Changcheng Zhao*

Investigating the Impact of DC-Link Capacitance on VSC Impedance Characteristics and Its Reduction Strategies under Weak Grid Conditions *Lei Meng, Zilin Li, Yinbo Ge, Ka Wing Chan*

A Novel PHIL System with (almost) Ideal Delay Compensation for Grid Impedance Emulation *Zhao Song, Christoph Hackl*

Comparative Analysis of TSD and NTC-Based Temperature Measurement for Power Semiconductor Modules *Eneko Agirrezabala, Ane Portillo Cancho, Miguel Lajas, David Garrido, Iosu Aizpuru*

Efficiency Improvement of Inductive Power Transfer System with Two-Stage Partial Power Processing *Hang Lu, jiyao wang*

Unified State-Space Modeling of Switched Systems in SystemVerilog With Emulated HiZ Phases *Sebastien Cliquennois, Silvia Tedesco, Francois Ravatin, Davide Lena*

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Fast Verification Flow for Switched Devices with Analog

SystemVerilog Models *Silvia Tedesco, Sebastien Cliquennois, Francois Ravatin, Davide Lena*

A Simple dv/dt and di/dt Closed-loop Active Gate Driver for SiC

MOSFETs *Xuhao Zhu, Wu Chen, Xiaokun He*

Negative Sequence Cancellation in DFIGs via Independently

Controlled Dynamic Braking Resistors *Filip Baum, Jesus Lopez, Javier Samanes, Jan Bauer*

Switching Loss Reduction in Dual-Inverter Topologies Using a

Modified Generalized Discontinuous PWM Strategy *Jakub Kucera, Filip Baum, Jan Bauer*

Graphical Analysis and Design Method for Class E Inverter Feeding

Complex Load at Any Duty Ratio *Zifan Zhang, Wei Wu, Yati Chen, Shuxiao Wang, Jiongfeng Lin, Min Sun*

A Novel Step-Wave AC Collection System for Efficient VSC-HVDC

Transmission *Zewei Hao, Wu Chen, Xiaokun He, Yueyin Wang, Siyi Luo, Jianxi Lan*

SM Grouping Based Capacitor Precharging Strategy for Thyristor

Branch Loop- Based Hybrid MMC *huailong li, Fujin Deng, Zijian Zhu, Sergio Vazquez*

Doblon

S24-I-SS25 - Data-driven fault diagnosis and fault-tolerant control for industrial systems

Chairs: Yuchen Jiang, Djaffar OULD ABDESLAM

A Low-Complexity Data-Driven Approach for Accurate Real-Time State of Health Estimation in Lithium-Ion Batteries *Hadi MAWASSI, Gilles Hermann, Djaffar OULD ABDESLAM, Lhassane Idoumghar*

A Detection-Driven Two-Stage Approach for Knee Cartilage MRI Image Segmentation with Memory Enhancement *Hancheng Qin, Dingzhou Li, Hao Luo, Yong Qin, Songcen Lv, Yuchen Jiang*

Advancing MOSFET Fault Type Detection Through Data-Driven Unsupervised Learning *Abdallah Alfaham, Murat Kocak, Furkan Elmaz, Jerome Mitard, Joris Vanderschrick, Kevin Mets, Siegfried Mercelis*

Robust Fault Detection for Li-ion Battery of Electric Vehicles via

Wasserstein GAN *Fu Jiang, Siqi Ruan, Ziling Tang, Heng Li, Rui Zhang*

Rational-Safe Reinforcement Learning Energy Management for Hybrid Electric Vehicles *Fei Li, Mingjie Li, Shaokun Li, Yue Wu, Yundong Song, Heng Li*

A Mechanism LSTM-Based Digital Twin Model for DC-DC Converters with Parameter Estimation Using An Ant Lion Optimizer *Ziyu Zhang, Yinxiao Zhu, Yongheng Yang*

Machine Learning-Based Distributed MPC with Consensus

Regularized for String Formation in Vehicle Platoons *zixuan li, wei zhang, zhe zhang, ruichi sun, Zeyuan Xu, Antonella Ferrara*

Optimizing Maintenance Processes with AI and Modern

Techniques *Emma Grass Casalini, Joao Afonso Bastos, Pu Sun*

Transfer Learning Based Motor Fault Diagnosis Using Motor Current Signals Robust to Speed, Load, and Capacity Variations *Wonho Jung, Junho Kim, Chanseung Yang, Jaewan Kim, Yong-Hwa Park*

Advanced Multi-Fault Diagnosis of PMSMs using Deep Transfer

Learning and CWT-Based 2D CNNs *Danya Al-Hindawi, Maher Al-greer, Imran Bashir, Abdul Aziz Ayub*

VMD-SO-LSTM Based Fault Prediction and Proactive Fault-Tolerant

Wednesday, 15 October 2025

Control Strategy for IGBT in Hydrogen Production Converters *Xinke Zhu, Jiawei Chen*
Entropy Production Analysis in Pressure-Swirl Nozzle Flow Fields with Implications for Data-Driven Fault Diagnosis *Chuanwei Wu, Zhipeng Ren, Weixing Zhou, Leonid Yanovski*
Multisource Knowledge Retrieval Augmented LLM-based Fault Diagnosis Method for Traction Drive Systems *Zixuan Xu, Zhiwen Chen, Jiamin Xu, Lingli Tan, Yuri Shardt*

Segovia

S19-R-SS49 - The Responsible Practice of Generative Artificial Intelligence for Industrial Applications and Systems

Chairs: Seiichiro Katsura, Chamod Samarajeewa

A Generative Agentic AI Framework for Analysis and Debiasing of Datasets and Machine Learning Models *Jayana Gunaweera, Lakshitha Gunasekara, Dileesha Rajapakse*
Generative AI Multi-Agent System with Retrieval Augmented Generation for Real-Time Furnace Operation Support in Industrial Manufacturing *Irini Provatidis, Kristian Sandström, Moris Behnam, Victor Cobilean*
Synthesis of OCT-A images from fundus images for Diabetic Retinopathy diagnosis using BVAC GAN *Raja Chandrasekaran, Sambath Kumar K, Kaushik P.B, Isuru Senadheera*
cktFormer: Transformer-Based Approach for Automated Analog Circuit Design *Pasindu Dodampegama, Praveen Wijesinghe, Naveen Basnayake, Keshawa Jayasundara, Tharindu Bandaragoda*
Thermal Behavior Forecasting for Battery Management Systems Using iTransformer and Kolmogorov–Arnold Network *Akash Samanta, Dominic Karnehm, Mohit Sharma, Antje Neve, Sheldon Williamson*
Data Generation for State-of-Health Estimation of Retired Batteries: Exploration of Conditional Vector Quantized Variational Autoencoder *Xiaoyong Zhang, Haobing Wu, Lisen Yan, Shunli Wang, Heng Li, yingze yang*
Hysteresis Modeling of Thumb Tip Force Estimation from sEMG Using Element Description Method *Daiki Sodenaga, Seiichiro Katsura*
Synthesizing Inline Security Monitors for ICS Using Generative AI and FormalBench *George Raptis, Taimoor Khan, Christos Koulamas, Dimitrios Serpanos*

Escudo

S25-I-TT12 - Industrial Informatics, Cloud Computing, and Big Data

Chairs: Stefano Scanzio, Chen-Wei Yang

SocGate: Physics-Gated Neural Network for Multi-Cycle Battery State-of-Charge Estimation *Xilin Dai, Ruidi Zhou, Jinhao Zhang, Fanfan Lin, Weifeng Zhang, Hao Ma*
Recognizing and Integrating Legacy Assembly Diagrams into Industry 4.0 *Nico Braunisch, Daniyar Serikov, Marko Ristin, Björn Otto, Marcin Sadurski, Hans Wernher van de Venn, Martin Wollschlaeger*
Soft Sensing of Ocean Current Velocity Profiles Based on Stratified Hybrid Convolutional Network *Haoxian wen, Sheng Du, Chengda Lu, Yawu Wang, Min Wu*
Performance Evaluation of Privacy-Preserving Life Cycle Assessment

Wednesday, 15 October 2025

Using Secure Multi-Party Computation Protocols *Hansani Perera, Udayanto Dwi Atmojo, Valeriy Vyatkin*
A High-Performance Fault-Tolerant Scheduling Mechanism for Virtualized Industrial Edge Applications *xinkai zhang, Shang Gao, Bintao Yu, Wenbin Dai*
Residual Aggregation and Multi-Head Attention Reweighting for Autoformer in Industrial Time Series Forecasting *Yanshu Wang, xichen xu, XiaoNing Lei, Chengbin Ma*
EASy-RM: Energy Automation Systems Requirements Management *Chen-Wei Yang, Matthew Kuo, Roopak Sinha*
A Data-Driven Framework for Anomaly Detection in Industrial Systems Using Log Data *Merle Hewing, Yuanchen Zhao, Manuel Vossel, Paul Nieschler, Tobias Kleinert*
A divide and conquer partitioning method for bigraph data in industrial grade intelligent unmanned distributed systems *Chaoze Lu, Chenxia Liu, Chenghao Li*
Multi-Runtime Actor Model Implementation and Benchmarks *David Bauer, Juho Mäkiö*
Adaptive and AI-Driven Vehicle Patrol Scheduling with Integrated Emergency Response *Majid Ghasemi, Dariush Ebrahimi*
Teaching-Learning-Based Optimization for Mobile Edge Caching Strategy *Lincan Li, Shengming Chang*

Thursday, 16 October 2025

08:30-10:30

Escorial

S31-I-TT14-3 - Control Systems and Applications

Chairs: Zheng Chen, Qianwen Xu

Research on Transient Power Control Strategy for Distribution System with Wind Turbines Incorporating System Contingencies *Runsheng Zheng, Lei Shang, Xuzhu Dong*
Accurate Model Predictive Tracking Control of Peltier Cells With Integral Action and an Unscented Kalman Filter *Felix van Rossum, Benedikt Haus, Paolo Mercorelli, Harald Aschemann*
Anti-Slip Control of Electric Locomotives Using Disturbance Observer-Based Adhesion Coefficient Estimation and Wheel Rotational Acceleration Detection *Seokmin Hong, Jong-Min Baek, Ju-Seok Kang, Chan-Bae Park, Hyung-Woo Lee, Jae-Bum Lee*
Decentralized Data-based Control for Nonlinear Interconnected DC Microgrids *Zhihao Song, Li Jin*
Vision-Based Fast Terminal Sliding Mode Control of Quadrotor UAV for Uncooperative Ground Target Tracking *HAMZA BOUZERZOUR, Ahmed Allam, Mohamed Guiatni, Abdenmour Dergal, Yasser BOUZID*
Fault-Tolerant Design Concept and Flatness-Based Control Approach for Electric Truck Pantograph Control Systems *Christoph Sachs, Martin Neuburger*
PID-Based Hierarchical Event-Triggered MPC for USV Trajectory Tracking *junlong liao, Huiping Li, Qifan Yang, YANMING ZHOU*
Online Feedback Controller Tuning using Sample-Efficient Bayesian Optimization with Problem-Specific Kernel Design *Mathias Schietecat, Laurens Jacobs, Taranjitsingh Singh, Jan Swevers*
Design of successive system switches along a desirable trajectory *Koichi Suyama, Noboru Sebe*
All-time Infrared Vision-based Pose Estimation for Autonomous

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Berthing of Unmanned Surface Vehicles *Tianheng Ma, Yundi Zhao, Liu Zhongtian, Zheng Chen, Ya-Jun Pan*

Unbalanced Vibration Suppression of Active Magnetic Bearing System based on Parameter Identification *Yuanhao Du, Qifan Xu, Wenfei Yu, Wei Hua*

Dynamic Programming-Based Multi-Spot Path Planning and LQR Control for Autonomous UAV Firefighting *Huajun Dong, Qiaomeng Qin, Erfan Dalfanian, Yufei Fu, Xiaobo Wu, Youmin Zhang*

Self error Compensated Predictive Current Control for a Induction Machine in Multi-modular VSI Converters *Carlos Romero, Sergio Toledo, Edgar Maqueda, David Caballero Morilla, Rodrigo Romero Vega, Julio Pacher, Magno Ayala, Raul Gregor, Marco Rivera*

Self-Error Compensated Sequential Predictive Control in Multi-Modular Matrix Converters *Rodrigo Romero Vega, Sergio Toledo, Edgar Maqueda, Carlos Romero, Raul Gregor, Marco Rivera, Alejandro Duarte, David Caballero Morilla, Hugo Hernán Lezcano Delvalle*

Hidalgo

S27-I-TT03-2 - Power Systems and Smart Grid

Chairs: Hady H. Fayek

Maximizing Photovoltaic Self-Consumption through Smart EV Charging without Stationary Storage: A Real-World Case Study *Bushra CANAAN, Djaffar OULD ABDESLAM*

Unsupervised Multi-Sequence Appliance Identification in Non-Intrusive Load Monitoring *Daniel Weißhaar, Pirmin Held, Djaffar OULD ABDESLAM, Dirk Benyoucef*

Data-Driven Sizing of PV-Battery Systems Across Different Load Profiles: A Focus on Field Measurements in Winter *Loïc DERGHOU, Pirmin HELD, Dirk Benyoucef*

The IEEE 1451 Playground: A Web-Based Tool for Standard Education *Helbert da Rocha, Eugene Song, Antonio Espirito-Santo, Riccardo Brama*

Enhancing Black-Box Adversarial Attacks on Power System Event Classifiers via Transferability *Yuanbin Cheng, Nanpeng Yu, Jim Follum*

Data-Driven Unsupervised Current Anomaly Excavation for Emerging Grid Scenarios *Wenqiang Lu, Feng Gao, Tao Xu*

Switching Kalman Filter for Parameter Identification of Reconfigurable Supercapacitors *Heng Li, Yige Zhang, Ayijiang Nuretai, ZiJian Zhao, Hui Peng, Yun Zhou*

Adapting the Maximum Loadability Index for Dynamic Scenarios to anticipate the occurrence of Voltage Collapse *Enrique Chaparro, Jhonatan Andrade dos Santos*

A Multi-Stage Strategy for Harnessing Congestion Management Services from Industrial Hubs in Local and System-level Markets *Leila Bagherzadeh, Innocent Kamwa, Atieh Delavari, Seyed Amir Mansouri*

Oscillation Mode Identification in Converter-based Offshore System using Dynamic Mode Decomposition *Maria Camila Castrillon Franco, Jose Luis Rueda, Arturo Román-Messina, Nakul Narayanan*

OLTC dynamic adjustment method considering renewable energy consumption promotion and uncertain voltage security risk *Jiacheng Xu, Xuzhu Dong, Lei Shang, Runsheng Zheng*

Optimization of a Hybrid Microgrid Using the Multi-Objective Gray Wolf Optimizer *Mauro Amaro, Luis Romeral*

TGN-RiBC: A Betweenness-Aware Temporal Graph Neural Network for Power Grid Risk Prediction under Dynamic Unit Commitment *Renbo*

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Zhang, Xilin Dai, Hua Wang

Flexibility Deployment in the 2050 Dutch Power System: A Seasonal Operational Assessment Francisco Reis, Jonathan Aviles Cedeno, Jose Luis Rueda, Peter Palensky

Modified and Augmented Nodal Analysis-based Optimal Power

Flow Kouamé N'Zi, Nasim Rashidirad, Jean Mahseredjian, Antoine Lesage-Landry

Physics-Aware Predictive Bidding Strategy for Battery Storage in Joint Regulation-Energy Markets Omar Abu-Znad, Liang Du, Fengyu Wang

Toledo

S29-R-TT02-3 - Power Electronics and Energy Conversion

Voltage-frequency Coordinated control Technology Based on Reverse Regulation of Thyristor Rectifier in a DFIG System Connected to MVDC Grid Xueshen Cui, Runqi Guo, Shuo Li, Qihui Liu, Chengyong Zhao, Yifei Li

Design of an Integrated Fault Limiting and Isolating DCPFC for HVDC Mesh Grids Yu Gao, Xuan Wang, Can Wang

Critical Parameter Characterization for Power Synchronization in Droop-Controlled Grid-Forming Converters under Transient Stability Constraints Hao Zhang, yipeng su, ke Cheng, heya Yang, xin Xiang, Jing Sheng, Xiangning He, Wuhua Li

Inductance Sharing Using Common-Mode Power Exchange in LCL Grid-Connected Inverters Ibrahim Amezyane, Narayan Kar, Caniggia Viana

Two-step predictive control of delta-connected CHB-based parallel active power filter Zdenek Kehl, Tomáš Glasberger

Delay-Compensated Modulated Predictive Power Control for Grid-Tied Three-Level NPC Converters Gianyacomio Zucchini, Raul Gregor, Julio Pacher, Osvaldo Gonzalez, Alfredo Renault

Performance Analysis of Zero-Sequence Voltage Balancing Methodologies in Grid-Tied NPC Converters for EV Charging Systems Mauro Boi, zohaib ejaz, Giuseppe Bossi, Alfonso Damiano

Modeling of an Off-Grid PV to Battery Systems for Street Lighting Applications Ignacio Alvarez, Guirguis Abdelmessih, Marcos Alonso, Marco A. Dalla Costa, Jose María Cámara

El Jardin

IES Fellow Search Comm.

Tapices

S30-I-SSGT-11 - Advanced Topologies and Intelligent Control for Next-Generation Power Converters

Chairs: Hadi Y. Kanaan

A Single-Switch Dual-Input High-Gain DC-DC Converter with Reduced Voltage Stress for Hybrid Energy Sources Integration Seshagiri Vemparala, MS Bhaskar, Mahmoud F. Elmorshedy, Dhafer Almakhlles

Quasi-Resonant DC-DC Combination Converter CSC-Zeta Full-Wave for Bipolar Outputs Cristian Díaz Martín, Eladio Duran Aranda, Salvador Pérez Litrán, Jorge Semiao

An Improved Current Sensing Technique for Boost PFC Converter to Mitigate Ringing-Induced Measurement Errors Chan-Gi Lee, Kwang-Woon Lee, Sang-Il Kim

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Model-free Predictive Control Strategy for DC-DC Converters Based on the Principle of Capacitive Energy Transfer *Chengxu Wang, Wei Zhang, Shuxin Zhang*

Improved Super-Twisting Nonsingular Terminal Sliding Mode Control for Capacitive Energy Transfer DC/DC Converter *Junjie Qi, Wei Zhang, Liyuan Wang, Shuxin Zhang*

Analysis and Design of the Multiport DC/DC Converter for DC Power Grid *Shuxin Zhang, Baolong Zhang, Tingzhen Qu, Naishi Liang, Hongpeng Liu*

A Novel Multi-Port Active Filtered DC/DC Converter for Power Grid *Shuxin Zhang, Minghao Gu, Qi Ma, Naishi Liang, Hongpeng Liu*

A Fourier-Series Modeling Approach and Loss Minimization for a Dual Active Bridge *Carolina Beckmann, Philipp Schmitz, Albrecht Gensior*

A Buck/Boost-Zeta Quasi-Resonant Full-Wave Converter

Combination for Bipolar Outputs *Cristian Díaz Martín, Eladio Duran Aranda, Salvador Pérez Litrán, Elena Bago Sotillo*

Modulation of Step-Down Partial Power Converter *Francisco Gonzalez, Hugues Renaudineau, Marcelo Perez, Thierry MEYNARD, Samir Kouro, José Rodríguez*

Physics-Informed Neural Network for the DC Solid State Transformers in DC Microgrid *Yu Zeng, Josep Pou, Guibin Zou, Huamin Jie, Ziheng Xiao, Ezequiel Rodriguez, Qingxiang Liu, ZHIGE YUAN, Yuan Gao*

State-of-Charge Estimation of Lithium-ion Battery Switched Balancing System Based on Switched Gaussian Process Regression *Heng Li, Shunli Wang, Xiaoyang Chen, Xiang Zhao, Yifei Sun, Yue Wu*

Data-Driven Optimization for Neutral-Point-Clamped Dual-Active-Bridge Converter with Zero-Voltage-Zero-Current Switching *Jiaxin Dong, Xinze Li, Dhivya Sampath Kumar, Sivaneasan Bala Krishnan, Josep Pou, Anurag Sharma*

Recent Advances in Transfer Learning Techniques for Power Converter-based Systems *Zhen Huang, Jiawei Gong, Yuan Gao, Chao Wang, Yu Zeng, Bing Ji*

Noise-Resilient State Estimation of Lithium-Ion Batteries Based on the Decoupled Iterative Modelling *Shuo ZHANG, Xijian Lin, Zifeng Chen, Dianxun Xiao*

Deep Reinforcement Learning-Aided State-of-Health and State-of-Charge Management of Battery Energy Storage Systems *Gaowen Liang, Enrique Nunes, Ezequiel Rodriguez, Yu Zeng, Wai Yan Hein, Josep Pou*

Optimal Coordination of Battery Energy Storage Systems in Power Electronics Dominated Grid *Aasritha Kareti, Harsha Vardhan Reddy Modugu, Uzair Asif, Reza Behnam, Mohammad Shadmand, Sudip Mazumder*

A novel methodology to estimate the efficiency of supercapacitor-based active balancing architectures *Roberto Di Rienzo, Luca Boccacci, Roberto Roncella, ROBERTO SALETTI, Federico Baronti*

Galeria

S32-R-TT13 - AI Applications in Control, Mechatronics and Robotics

Chairs: Harald Aschemann, Sehoon Oh

Deep Reinforcement Learning-Based Cost-Optimized Control for Energy Management in Facilities with Geothermal Storage *Vahid Ehteshami Bojnurdi, Hamed Amini, Udayanto Dwi Atmojo, Valeriy Vyatkin, kari Alanne, Risto Kosonen*

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Semi-Autonomous Teleoperation for Mobile Manipulator via Action Chunking with Transformers *Shuntaro Itakura, Masatoshi Nagano, Tomoaki Nakamura*

Deep Reinforcement Learning-Based Collision-Free Path Planning for Robotic Manipulators With Dynamic State Vector Sorting *Sven Adrian Weishaupt, Ricus Husmann, Kaneewar Ibrahim, Harald Aschemann*

Improving Generalization and Training Speed of Deep Reinforcement Learning-Based Robotic Path Planning With Vectorized Environments *Sven Adrian Weishaupt, Ricus Husmann, Harald Aschemann*

Deep Reinforcement Learning for Tuning of Adaptive Model Predictive Control for Autonomous Driving *Feras Hamadeh, Anas Abdelkarim, Amar Hamadeh, Daniel Görges, Holger Voos*

A Modular Code Generation Method for Industrial Automation Systems based on Large-Language Models *Zhangjun Chu, Junchi Zhou, Yingyue Zhang, Wenbin Dai*

Dimensionality Reduction of Hand Gestures and Virtual Force Feedback for Intuitive Robot Gripper Control: A Machine Learning Approach *Sattra Piyapunsutti, Soya Shimizu, Takahiro Nozaki*

Synthetic image data generation for the training of a segmentation algorithm for machine tool recognition *Manuel Belke, Oliver Petrovic, Tim Peters, Christian Brecher*

Comendador

Chapters meeting

Castilla

S26-I-TT01-3 - Electric Machines and Industrial Drives

Chairs: Zhitai Liu

Evaluation of Efficiency Maps Based on a Preliminary Sizing of Permanent Magnet Synchronous Machines for Naval Propulsion

Application *Fabian Amoros, Jean-Frederic CHARPENTIER, Walter Lhomme, Benoît Nottellet*

Analysis and Fault-Tolerant Control of Permanent-Magnet Synchronous Machines under Multiple Open-Switch Converter

Faults *Urs Pecha, Nejila Parspour*

Considerations on Iron Nitride Enabled Rare Earth Free Hybrid

Variable Flux Machines *Julius Kesten, Matthias Brodatzki, Martin Doppelbauer*

A Variable Magnetomotive Force Memory Motor Drive System Capable of Reducing Magnetization Current to One-Third *Manari Mizuno, Sari Maekawa, Tomoyuki Seya*

Performance Comparison of State Observers in Speed-Sensorless Predictive Direct Speed Control for PMSM Drives *Emmanuel de Moura, Rodrigo Padilha Vieira, Marco Rivera*

Quantification of End Turn Leakage Effects for a Double Stator Single Rotor Axial Flux Machine *Vineetha Puttaraj, Sonja Karin Tidblad*

Lundmark, Torbjörn Thiringer

Modeling and Control of a New Four-level Converter-fed Synchronous Motor for Pumped Hydro Storage Plants *BHUMA NAGA SATYASAI VEMPALI, DEEPAK RONANKI, Apparao Dekka, Srirama Srinivas*

Bus-clamping PWM with Common-Mode Voltage Elimination for Dual Six-Phase Inverters with Shared DC-link *Prasoon Chandran Mavila, Sobhan Mohamadian, Concettina Buccella, Carlo Cecati*

Constant Common Mode Voltage based Space Vector PWM Variants

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for a Six-Phase Interior Permanent Magnet Synchronous Motor Drive *Aritra Pal, Srirama Srinivas, DEEPAK RONANKI*

Electromagnetic Transient Modeling of Switched Reluctance Motor Drive System by a Circuit-based Method *Seyedarmin Mirnikjoo, Nicolas BRACIKOWSKI, Mohammed Naidjate, Jean Mahseredjian, Paul Akiki*

Near-Zero Common-Mode Voltage Implementation in CSI-Based Motor Drives via Active EMI Filter *YINZHEN SHEN, Zheng Wang*

Comparison of Optimized Electrically Excited Wound-Field and Permanent Magnet Synchronous Motors for Light EV Applications *Melisa Recabarren, Carlos Madariaga, César Gallardo, Federica Graffeo, Matias Jimenez, Gustavo Perez, Juan Tapia*

Hairpin Windings in Double-Cage EV Motors: Impact on Torque and Efficiency under Variable Frequency Operation *Felipe Santacruz, Carlos Gálvez-Araya, Carlos Madariaga, Juan Tapia*

Comparison of Various Practical and Non-Practical Segmented Rotor Alternatives for Spoke Type IPM Motors *Ozlem Simsek, Murat Onsal, Metin Aydin*

Armature Reaction Compensation Method for Embedded Magnetic Encoder in Permanent Magnet Synchronous Motors *Chao Zhang, Wei Hua, Yuchen Wang*

Doblon

SYP Forum

Segovia

S28-R-TT01-1 - Electric Machines and Industrial Drives

Chairs: Jose Antonino Daviu

Impact of Discontinuous PWM Techniques on NVH Performance in IPMSMs *Mahmoud Khamis, Arnau Doria-Cerezo, Victor Repecho del Corral*

Adaptation of a multi-fault tolerant control for PMSMs to phase short circuits *Martin Ackermann, José-Luis Marqués, Claus Hillermeier*

Position-sensorless control of Dual Three-Phase Synchronous Motors in all speed ranges with a single linear observer of Extended EMF excited by Signal Injection and Speed *RONGJIAO HAO, Shinji Doki*

Oversampling-Based Inductance Identification Without Test signal Injection for PMSM Drives *Ryosuke Morita, Sari Maekawa, Takeshi Shibayama, Toshimitsu Aizawa*

Analytical Electromagnetic Calculation for PMSM Operating with Inter-Turn Short-Circuit Fault. *Leonardo Duarte Milfon, Gabriela Torllone de Carvalho Ferreira, Mateus Giesbrecht*

Development of a Segmented Stator with Integrated Oil Cooling of a PMSM Using Additive Manufacturing *Tomas Paveza, Martin Skalicky, Zdenek Frank, Roman Pechanek*

Sensorless Control of Non-Sinusoidal PMSM via Sliding Mode Observer and PSD+PLL Structure *Luis Felipe Pessoa Teixeira, Lucas Rossato Rocha, Dianxun Xiao, Rodrigo Padilha Vieira*

Escudo

TC Forum

10:50-11:50

Auditorio

Keynote 3 - Refined anti-disturbance estimation and control and its applications to unmanned systems

Thursday, 16 October 2025

	Complex systems including many unmanned systems inevitably suffer from composite disturbances that are physically multi-source, mathematically heterogeneous, and topologically isomeric. In the conventional methodologies, these composite disturbances are simplified as a single lumped or “equivalent” variable to be either rejected or attenuated. In this talk, the composite disturbance filter (CDF), the refined anti-disturbance estimation (RADE) and control (RADC) theoretical framework for multiple disturbance systems will be introduced. The refined estimation and control scheme includes disturbance modeling and estimation/learning/prediction, multiple disturbance separation, observability and controllability analysis of disturbances, disturbance absorption and utilization. And, the reconstruction optimization will be presented based on disturbance adaptive variability rather than the disturbance invariance principle (DIP). Especially, for multiple disturbance systems with stochastic disturbances, this research framework focus on stochastic distribution control (SDC) and estimation, aims to overcome the limitation of Gaussian and independent identically distributed variables in Kalman filtering and Bayesian estimation theory. Finally, several practical applications will be presented to the autonomous navigation and control of unmanned systems. Professor Lei Guo was born in Qufu, China, in 1966. He received the B.S. degree and the M.S. degree from Qufu Normal University, in 1988 and 1991, respectively, and the Ph.D. degree from Southeast University, Nanjing, China, in 1997. From 1999 to 2003, He once worked with IRCCyN, Nantes, Loughborough University, UMIST and Manchester University as Research Associate/Fellow and Visiting Professor, respectively. From 2003 to 2006, he is a professor at Southeast University. Currently, he is a Distinguish Professor and Director of the Space Intelligent Control Research Center at Beihang University, Beijing, China. He is an Academician of the Chinese Academy of Sciences (CAS), a Fellow of IEEE and IET, Chinese Association of Automation (CAA), and China Association of Inventions (CAI). He is the Director of the Navigation, Guidance and Control Committee of the CAA. His research interests include anti-disturbance control theory and applications to unmanned systems. He has published more than 480 papers, 7 monographs, and has more than 180 authorized invention patents. He was the recipient of the National Science Fund for Distinguished Young Scholars (2009), the National Nature Science Awards (2013), National Technology Invention Awards (2018), National Pioneer Innovation Award (2023) of China. He also obtained the Gold Medal of International Exhibition of Inventions of Geneva, Nuremberg and Turkey for the studies on bio-inspired navigation sensor, compound-eye-inspired navigation systems and biomimetic flying robots, respectively.
10:50-12:50	Escorial S91-I-TT09 - Communications for Industrial and Factory Automation Chairs: Haibo Cheng Enabling Continuous Low Latency Streaming in Industrial Roaming Scenarios <i>Daniel Tappe, Alex Bendrick, Rolf Ernst</i> 5G and UWB Integration for Robot Collaboration <i>Damir Hamidovic, Armin Hadžiaganovi r, Julian Karoliny, Andreas Gaich, Daniel Klepatsch, Mahin Ahmed, Raheeb Muzaffar, Andreas Springer, Hans-Peter Bernhard</i>

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Enhanced Multi-Agent Reinforcement Learning for Power Quality Enhancement and False Data Injection Defense in Multi-Microgrid Systems *Pengcheng Hu, Abhisek Ukil*

Approximate Representation of Gaze Rate using GMM *Sota Shimizu, Miwa Takase, Takumi Morimoto*

Obstacle Avoidance Control Design Using Imitation and Reinforcement Learning for Two-Wheeled Robot with A Stereo Camera *Koichi Hidaka*

Short-Term Prediction for Waste Heat Recovery Power Generation Based on Crossformer Network in Coke Dry Quenching

Process *Xiaochong Chen, Fan Yin, Yiheng Chen, Wen Zhang, Jie Hu, Jundong Wu, Min Wu*

mp-PINN: A Multiphase Flow Physics-Informed Neural Network for Pressure and Saturation Prediction *xiaodi zhang, Cheng Haibo, Jiahao Qiao, Minglu Hu, Liting Zhang, Dong Li*

Automated Construction of a 3D Spinal Point Cloud Model Integrating Hounsfield Units for Scoliosis Progression Prediction *Soma Ito, Yasue Mitsukura*

Impacts of Cyber-Physical Attacks in SST-GFMI-Based

Microgrid *DEBOTRINYA SUR, Uzair Asif, Harsha Vardhan Reddy Modugu, Luiz Fernando M. Arruda, Sudip Mazumder, Mohammad Shadmand*

Hidalgo

S84-I-SSGT-4 - Optimal Management and Control of Integrated Multi-Energy Systems

Chairs: Samir Kouro

Coordinated Optimal Control of Dispatchable Energy Storage Systems in Integrated Energy Hubs *Muhammad Abdelghany, Mainak Dan, Ahmed Al-Durra, mohamed. Elmoursi, Fei Gao*

Cooperative Reinforcement Learning for Car-Following and Energy Management Optimization of Dual-Motor Electric Vehicles *Yao Peng, Zhiwu Huang, Yue Wu, Shaokun Li, Xiaoyong Zhang*

Safe Deep Reinforcement Learning Based Energy Management for Educational Buildings With Guaranteed Constraints *Xuan Jiang, Qianwen Xu*

Hierarchical Ensemble Based Clustering For Networked Microgrids *Aditya Joshi, Tianfu Wu, Mo-Yuen Chow*

Energy Management for Swedish Railway Traction Systems with Energy Storage Systems integration *Fei Liu, Qianwen Xu*

An Energy Management Strategy for Aviation Fuel Cell Hybrid Power System based on Optimized Parasitism-Predation Algorithm *feier meng, Rui Ma, Yang Zhou, Hao Bai, Zhirui Guo, zi wang*

A Statistical Approach for Charging Power Demand Estimation of An Electric Harbour Craft Fleet *Chenhao Ying, Elsa Feng, Yan Xu, Tay Chuan Beng, Kenneth Low Choon Ann*

Onshore Microgrid Optimal Operation with Incentive-based Harbor Craft Fleet Management *Sufan Jiang, Chenhao Ying, Heling Yuan, Yan Xu, Elsa Feng*

Toward Standardized Demand-Side Management Frameworks: A Policy-Driven Approach for Smart Grid Integration in Qatar *Muneera Al-Qahtani, Ameni Boumaiza, Furkan Ahmad, Sa'd Shannak, Antonio Sanfilippo*

Interoperability of Electrolyzer Systems with Hydrogen Storage for Frequency Regulation *Manuel Agredano Torres, Lars Nordström, Qianwen Xu*

Thursday, 16 October 2025

Integrating next-generation lithium-ion batteries into hybrid energy storage systems: A physics-based analysis *Andrés Bernabeu Santisteban, Alejandro Clemente, Sergi Obrador Rey, Francisco Díaz-González, Killian Stokes-Rodríguez, Lukas Neidhart, Lluís Trilla, Simon Clark*

A Real-Time Optimization Framework For Trading Boiler Flexibility on Secondary Reserve Markets *Manisha Talukdar, Alessandro Quattrociochi, Laurena Eliard, Tomislav Dragicevic*

Impact of Communication Link Failures on Distributed Energy Management in Disaster Relief Microgrids *Hengrui Tian, Aditya Joshi, Mo-Yuen Chow*

Weight Matrix Construction for Distributed Consensus Algorithm in Water-Energy Nexus: Convergence and Robustness *Ahmad Alhaji, Alexandra Duel-Hallen, Mo-Yuen Chow*

Robust Real-Time SOH Estimation via Online Identification of Temperature and SOC Dependent Battery Resistance Model *Skieler Capezza, Mo-Yuen Chow*

Toledo

S86-R-TT07-2 - Transportation Electrification and Automotive Technologies

Chairs: Mohammed Benbouzid

Dual-Perspective 1D Fully Convolutional Network for State of Health Prediction in Maritime Battery Systems Using Charge and Discharge Curves *Qin Liang, Peihua Han, Erik Vanem, Knut Erik Knutsen, Houxiang Zhang*

Real-time Train Trajectory Optimization under Emergency Scenarios based on Diffusion-PSO Framework *Zhang Yao, Zixuan Zhang, Liu Shaoqing, Liu Ling, Hairong Dong*

Research on the dynamic balance energy management strategy for fuel cell UAV hybrid power systems *Shuhao Deng, Tao Lei, Xiangnan Deng, Yacong Li, Guanlin Fan, Xiaobin Zhang*

Energy Management in HEVs Using Deep Reinforcement Learning: A Review *Mohamed Nadir Boukoberine, Muhammad Fahad Zia, Mohamed Benbouzid*

Multi-Dimensional Safety Assessments of LLM-Assisted Driving Systems *Chenfei Hou, Henglai Wei, Xuefeng Han, Hui Zhang*

Distributed Control-Based Fault-tolerant Control Method for AAV's DEP System *Ruiheng Zhang, Tao Qu, Zihao Liang, Tianjian Sun, Yuhua Du, Aili Fan, Yigeng Huangfu*

Data-driven Path-following Control Using a Fictitious Exogenous Signal Based on the Velocity Variation of Path Deviation *Shusaku Fujita, Kenji Sawada, Osamu Kaneko, Taichi Ikezaki*

Robust Cybersecurity for Autonomous Vehicles Using Particle Filter Based Anomaly Detection *Rajeem Thomas, Mien Van, Mehrdad Dianati, Wei Ding, Kabirat Olayemi*

Galeria

ARM Workshop

Comendador

Chapters meeting

Castilla

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S83-I-TT06-1 - Smart Building Technologies

Chairs: Jan Haase, Moe Alahmad

Comparative Study of Kalman Filters for Electrical Identification in Domestic Induction Systems Óscar Lahuerta, Claudio Carretero, Luis Angel Barragan, Jesus Acero

Study on Battery Energy Storage for Reduction in CO2 Emissions of All-electrified Houses with Photovoltaic Resource Mincheol Cho, Tomonori Honda

Enhancing Day-Ahead Energy Consumption Forecasting with Inception-Autoformer for Demand Side Management SENFENG CEN, Chang Gyoong Lim

Efficient Data-Driven Model Predictive Control for Demand Response of Commercial Buildings Marie-Christine Paré, Vasken Dermardiros, Antoine Lesage-Landry

Worker Positioning Method Based on Motion-Aware Inertial Regression for Smart Construction Sites Yujin Kuang, Mujiao Ouyang, Yuan Yang, Xiaoguo Zhang

System Design for Distributed Energy Management Using Multiple LPWAN Technologies Christof Roehrig, Daniel Hess, Buu Hai Dang Trinh
Demand-Side Management in Residential Buildings: Load Shifting and Cost Savings via a Cloud-Based IoT-BEMS Fayzul Islam, Ibrahim Ahmed, Lucian Mihet-Popa

Attention Makes HVAC Control More Efficient khalil al sayed, Abhinandana BOODI, Roozbeh Sadeghian Broujeny, Karim Beddiar

Current Calculation Method for PV System using Capacitor Voltage Characteristics Cheol-Woong Choi, Jae-Sub Ko, Song-Do Ki, Dae-Kyong Kim

Suppressing Output Voltage Fluctuations in Dynamic EV Wireless Charging via PI-Controlled Boost Converter Hassan Khalid, Saad Mekhilef, Marizan Mubin, Mehdi Seyedmahmoudian, Alex Stojcevski, Hussain Bassi, Ahmed Alghamdi, Amr Mohamed Mahmoud, Hajer Albutuwaybh

Doblon

SYP Forum

Segovia

S85-R-TT04-2 - Renewable Energy and Energy Storage Systems

Control of Power Reserves of a Wind Turbine by Constant Thrust Force Method considering Requirements of the Real Wind

Field Benedikt Spichartz, Constantinos Sourkounis

Optimized Management for the Distribution of Power Reserve in a Wind Farm with Reduction of Aerodynamical Interactions caused by Wind Wakes Benedikt Spichartz, Constantinos Sourkounis

Implementation of the Three-Dimensional SWiPLab-WFM Wind Farm Simulation Model on a Real-Time Simulator Cluster for HIL-

Applications Vile Kipke, Kolja Wehber, Constantinos Sourkounis

Performance Evaluation of an AI-based Wind Farm Operation Control Under Dynamic Wind Conditions Philip Krajinski, Constantinos Sourkounis

Energy based Sub-Synchronous Oscillation Assessment Tool For Type-4 Wind Farms Muhammad F. Umar, Omar Abu-Rub, Tassneem Zamzam, Yazan Qiblawey, Abdulrahman Alassi, Hussein Alnuweiri

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	The effect of blade optimization on wind turbine performance <i>Hercules Oliveira, Lucas de Paula A. Pinheiro, Orlando da Silva Santos, Fábio Silva Alves, Joel Alves da Costa</i> Consensus-Based Distributed Control of Offshore Wind Farms Connected via DR-HVDC <i>YUANXIANG Sun, Zhenbin Zhang</i>
	Escudo TC Forum
11:50-12:50	Auditorio Keynote ICELIE - Industry 5.0 and Engineering Education: Shaping the Future of Human-Centered Innovation Keynote Speaker: Prof. Manuel Castro, IEEE Fellow IEEE Former Division VI Director IEEE Education Society President Emeritus Industry 5.0 is reshaping how we live, work, and learn, moving beyond the purely technological advances of the past to put people and sustainability at the center. This new phase builds on the foundations of Industry 4.0 but shifts the focus toward collaboration between humans and machines, blending advanced technology with human creativity and responsibility. It's not just about smarter systems; it's about smarter societies. In this evolving landscape, the concept of "smart" is no longer limited to cities or devices but extends deeply into our personal environments, forming what we call Personal Smart Cities. These environments integrate ambient intelligence and connected technologies to create spaces that respond intuitively to our needs, enhancing quality of life while emphasizing ethical and sustainable development. Education and training are key pillars of Industry 5.0, where Smart Learning merges cutting-edge technology with human-centric approaches. Methods like open learning formats—Learning Objects, Open Course Ware, MOOCs—and the rise of lifelong learning foster inclusivity and personalization. Engineering education, in particular, is embracing this shift by integrating practical skills through simulations, remote labs, and immersive environments, preparing learners to thrive in a world where technology and human insight go hand in hand. This presentation draws on over three decades of experience in distance education and skill development, showing how these efforts have evolved into Technology Enhanced Learning (TEL) that aligns with Industry 5.0's vision. Projects like SUTEE, In4Labs, and ECoVEM demonstrate how practical training in Vocational Education and Training supports broader European goals, such as the European Chips Act and ICT convergence. As Industry 5.0 unfolds, it challenges us to rethink evaluation, performance, and the role of technology—not just as tools, but as partners that respect and enhance our social and personal identities. This is the future of engineering education and beyond: a future where technology serves humanity, sustainability, and ethical values in equal measure.
14:10-16:10	Escorial S38-I-TT13-1 - AI Applications in Control, Mechatronics and Robotics Chairs: Kyunghwan Choi Enhancing Physical Human-Robot Interaction: Recognizing Digits via Intrinsic Robot Tactile Sensing <i>Teresa Sinico, Giovanni Boschetti, Pedro</i>

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Neto

Normal Distribution Priority Path Planning Method for Unmanned System *Weiming Li, JiaXin Zhuang, Liqun Chen, XiaoLin Mou*

Model-Agnostic Meta-Learning Inspired Adaptive Control Framework for Unknown Payload Picking *Nuo Chen, Ya-Jun Pan*

Development of a Variable Stiffness Musculoskeletal Percussion Robot and Realization of Single Stroke Motion through Sim to Real

Transfer Tsukasa Biyajima, Rei Yamazaki, Manabu Okui

Event-Based Adaptive Koopman Framework for Optic Flow-Guided Landing on Moving Platforms *Bazeela Bandy, Chandan Kumar Sah, Jishnu Keshavan*

Progressive Domain Transfer Learning for Contact-rich Hand-Tool-Environment Interaction *Jinke Yao, Wenxin Zhu, Yilin Lang, Qinyuan Ren*

Industrial Control Software Migration Based on Large Language Models *Maodong Lin, Kirill Zhukovskii, Carl Akira King, Wenbin Dai, Valeriy Vyatkin*

Online Actor Critic Learning for Optimal Tracking in Servo Positioning Systems *Hyochan Lee, Kyunghwan Choi*

An Enhanced Composite Predictive Framework for UUV Autonomous Docking via Motion Pattern Decoupling *Zhe Zhang, wei zhang, Ruichi Sun, Zhijian HU, Ziqi Xia, Zhicheng Liang, zixuan li*

GearCloud: Digitalized Maintenance Solution for Aircraft Landing Gear Brake Wear Inspection Automation Using YOLO11 *Mohamed Marei, Bilal Ahmad, Tianmei Jin, Wajid Azam*

TLS-based TV-CAR speech analysis and evaluation of F0 estimation *KEIICHI FUNAKI*

Design and Experimental Validation of Unmanned Cultural Heritage Exploration Vessel with Hybrid DC Power System *Dong-Wook Kim, Duck ShickShin*

Autonomous Leader-Follower UAV System for Real-Time Wildfire Detection and Suppression *Amin Taherzadeh, Youmin Zhang, Linhan Qiao, Erfan Delfanian, Xiaobo Wu*

Depth-Homography Registration Framework and YOLOv8n-Coordinate Attention Forest Fire Detection for Visible-Infrared UAV Imagery *Erfan Delfanian, Huajun Dong, Youmin Zhang, Hamza Benzerrouk Benzerrouk, Hakim Guiddir*

Hidalgo

S34-I-TT07-1 - Transportation Electrification and Automotive Technologies

Chairs: Davide Barater, Giampaolo Buticchi

Hybrid Optimal Power-Flow Control for Multi-port Railway Power Conditioner with Renewable Energy Access *Zhen Zhu, Manchung Wong, Ziyi Bai*

A Development of Cascade Cooling System for Thermal Energy Management of Electric Vehicle *Jaehyun Song, Taehan Kim, HwanYeui Hong, SungHyun Moon, Chulmin Kim*

Effects of Aging on the EMI Filter Performance in a Traction Inverter *Quirc Perez-Farre, Luis F Gomez-Rivera, Carlos López Torres, Antoni García Espinosa, Alejandro Paredes Camacho*

A Study on Hot Gas Recycle System to Reduce PTC Heater Capacity in Electric Vehicle *SungHyun Moon, Taehan Kim, HwanYeui Hong, Jaehyun Song, JongMoon Won, Chul-Min Kim, Tae-Min Park*

Stability Analysis of Grid-Forming Converters in Shore-to-Ship Power

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Applications *Diego Rios-Castro, Borja Abal-Calvar, Pablo Marino Fernández-Abraldes, Diego Pérez-Estévez, Jesús Doval-Gandoy*
Integrated Converter for Power Transfer and Battery Temperature Modulation in EVs *Mohd Usman, Ramana Manohar, Moumita Das*
Design of an Induction Motor for Electric Motorcycles in sub-Saharan Africa utilizing readily available materials *Stefan Botha, Alford Sibanda, Nkosinathi Gule*
Comparison of Control Strategies for Optimized Cooling of Electrical Machines in Automotive Applications *Davide Paolucci, Kristian K. Ronnberg, DAVIDE BARATER, Gabriele Puccio*
Adaptive Linear Predictive Control for Enhancing Sustainability in Battery Electric Vehicles Through Optimal Battery Discharging *Moustafa Magdi, Mujahed Aldhaifallah, Wei Xu, Hegazy Rezk*
Comprehensive Assessment of the Impact of Energy Management Strategies on the Sizing of Energy Storage Systems in Hybrid Vessels *Rene A. Barrera-Cardenas, Luigi Piegari, Pietro Tricoli, salvatore d'arco*
Data-Based Review of Battery Electric Vehicle and Traction Inverter Trends *Christoph Sachs, Martin Neuburger*
Active and Reactive Power Control of Traction Substation 25 kV / 50 Hz *Milos Straka, Vojtech Blahnik, Martin Pittermann*
AC-Voltage Controller for Grid-Forming Converters in Shore-to-Ship Applications *Borja Abal-Calvar, Diego Rios-Castro, Diego Pérez-Estévez, Jesús Doval-Gandoy*
Comparison Framework for Power Control Methods Under Identical Droop Conditions *Borja Abal-Calvar, Diego Rios-Castro, Diego Pérez-Estévez, Jesús Doval-Gandoy*
Hybrid Offshore Wind-Hydrogen Microgrid for Marine Docking Stations: Design and Energy Management for Economic Operation *Youcef Belkhier, Salah Tamalouzt, Emmanuel Delaleau, Gang YAO, Abdeslam Mamoune, Mohamed Benbouzid*

Toledo

S36-R-TT02-4 - Power Electronics and Energy Conversion

Model-Based Control Strategy Design for a High-Gain DC-DC Converter with Power Factor Correction and LCL Coupling
Filter *PANFILO RAYMUNDO MARTINEZ RODRIGUEZ, Karen Monserrat Compean-Rodriguez, Diego Langarica Córdoba, Gerardo Vazquez-Guzman, Samuel Iturriaga Medina, Christopher Jesus Rodríguez Cortes*
New Hybrid High-Gain Bidirectional DC-DC Converters for Energy Storage Applications *VEERA VENKATA SUBRAHMANYA KUMAR BHAJANA, Pravat Biswal*
Analysis and modeling of voltage unbalance in three level dc/dc converters *Saad Ahmad, Alejandro Fernández, Mariam Saeed, Igor Larrazabal, Fernando Briz*
Comparative Analysis of Gradient-Based, Metaheuristic and Hybrid Methods for Parameter Identification in Digital Twin for DC/DC Converters *Parsa Behzad Nazif, Mariam Saeed Hazkial Gerges, Saad Ahmad, Iker Muniategui, Guillermo Ozaita, Igor Larrazabal, Fernando Briz*
A Steady-state Balanced Current Control of a Two-arm Series Capacitor Step-down DC-DC Converter Employing Voltage Feedback Control *Chin Hsia, Hung-En Liao, Jung-yi Li*
A Bidirectional Isolated Multi-Phase DC-DC Converter with the Capability to Suppress Specific Harmonic Orders *Shuhei Tsuji, Takehiko*

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Sumida, Koki Nagae, Kenichi Nagayoshi, Yoshitaka Kawabata
Natural Voltage Balance Across Capacitors in High Step-down DC-DC Converter with Voltage Divider *Robert Stala*
Stability Evaluation of Model Predictive Control for DC-DC Converter under Load Variation *Takaharu Ishida, Hidenori Maruta*

El Jardin

IES TC Meetings

Tapices

S37-I-SSGT-12 - Advanced Control and Design for Electric Drives and Power Electronic Systems

Chairs: Dmitri Vinnikov, Enrique Romero-Cadaval

Avoiding Average Deception in Multi-vector Direct Schemes for Nine-phase PMSM Drives *Juan Carrillo Rios, Juan José Aciego, Rafael Lara López, Mario Duran, Ignacio González Prieto*

Determination of Inductances of Five-Phase Synchronous Machines with Interior Magnets *Luís Pereira, Gustavo Eckhardt, Gabriel Castelo Branco, Matheus Perin*

Single and Multi-vector Model Predictive Control for Open-end-Winding Five-phase Electric Drives *Raúl Sánchez-González, Mario Duran, Ngac Ky NGUYEN, Ignacio González-Prieto, Manuel Madueño, Xavier Kestelyn*

Multi-vector Model Predictive Control with Variable Sampling Time for a Six-Phase IM Drive *Rafael Lara-Lopez, Ignacio González Prieto, Mario Duran, Pablo Mora-Moreno, Angel Gonzalez-Prieto, Cristina Martin, Manuel R. Arahal, Federico Barrero*

Look-Up Table Model-Free Predictive Control Using Stationary Frame Updating Mechanism *Pablo Mora-Moreno, Juan Carrillo-Rios, Juan Jose Aciego, Angel Gonzalez-Prieto, Mario Duran, Ignacio González Prieto*

Comparison of Industrial Three-phase Medium-Voltage Converters and a Nine-phase Converter *Rodrigo Bastos, Braz J Cardoso Filho*

Adaptive Neural Current Controllers for Decentralized and Non-Sinusoidal Multiphase Drives in Healthy and Faulty Modes *Cyril Michel, eric semail, Ngac Ky NGUYEN, Jean-Christophe Riou*

Voltage Zero-Sequence Components in Optimal Control of Five-Phase PMSM Drives *Jan Laksar, Tomáš Komrska, Ondrej Suchy, Vaclav Šmídl*

Fault-Tolerant Performance in Multi-Unit PMSMs Through Slot Geometry and Magnetic Decoupling *Yingnan Wang*

Numerical Thermal Analysis of Six-Phase PMSMs With Single- and Double-Layer Fractional-Slot Concentrated Windings in Healthy and Faulty Cases *Wessam Abdel-Azim, Alejandro Yepes, Ahmed Hemeida, Ayman Abdel-Khalik, Shehab Ahmed, Jesús Doval-Gandoy*

Current References for Optimized Loss and Torque Ripple Per Operating Point in the Full Torque-Speed Range for Symmetrical Six-Phase PMSMs With Arbitrary Back-EMF *Alejandro Yepes, Mohamed Abdel-Moneim, Wessam Abdel-Azim, Óscar López, Petros Karamanakos, Ayman Abdel-Khalik, Shehab Ahmed, Jesús Doval-Gandoy*

Dynamic Modelling of Brushless Multiphase Synchronous Generator (BMSG) *Sagar Dash, Suman Maiti, Chandan Chakraborty*

An Active Redundancy Module and Overlapped Switching Scheme for incorporating Fault Tolerance and ZVS in Isolated DC-DC

Converters *Aditya Shirodkar, SATISH NAIK BANAVATH, Riccardo Mandrioli, Giovanni De Carne, MOSHE SITBON*

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Trade-Offs in Current PI Controllers Design for Switching Power Converters *Yoav Aminov, MOSHE SITBON, Alon Kuperman*
A Comparative Analysis of Integrated Heat Sink and Heat Pipe Cooling in a Heat Pump SiC Frequency Inverter *Martin Novak, Suliman Badour*
Online Learning-based Coordination Control of the Interlinking Converter in Hybrid ac/dc Microgrid *Javier Gutiérrez-Escalona, Carlos Roncero-Clemente, Oleksandr Matiushkin, Enrique Romero-Cadaval, Eva González-Romera, Joao Martins*

Galeria

S39-R-TT14-1 - Control Systems and Applications

Chairs: Bin Zhang, Jing Zhou

Lightweight Empirical Reinforcement Learning Driven Adaptive Super-Twisting Control with Fused Linear-Nonlinear Sliding Surfaces for Embedded Vehicle Control *Hyunjoong Lee, Daejin Park*
Disturbance Rejection beyond the Nyquist Frequency under Sensing Delay: Application to An Image-based Stabilization System *Kaoru Yamamoto, Li Wen, Tao Tang*
Unsupervised Time Series Anomaly Detection Based on Conditional Variational Auto-Encoder *Jiajun Gui, Yuhao Li, Duanjin Zhang*
Bidirectional Grid-Forming Converter with Modified Voltage Control for Enhanced Power Dynamics *Amiron Serra, Khristian Nascimento, José Gomes de Matos, Luiz Antonio Ribeiro, Mehdi Savaghebi, Hércules Oliveira*
Nonlinear Control for Underactuated Overhead Crane Using Composite Outputs under Constraints *Shengzeng Zhang, Xinggao Liu, Michael Basin, Zhu Haiyue, Chentao Han, Xiongxiang He*
Polynomial Fuzzy Approach to State/Fault Estimation: Application to Robotic Arm *Jingyu Ding, Jinyong Yu, Michael Basin*
Comparison of Effective Linear Blade Pitch Controllers for a Nonlinear Floating Offshore Wind Turbine System *Masayoshi Toda*
Cycle Time Reduction in Production Systems via Digital Twin-Based Compensation of Pneumatic Reaction Times *Jonas Heller, Bernd Luedemann-Ravit, Lars Penter, Steffen Ihlenfeldt*

Auditorio

Industry Forum 2

Comendador

S40-I-ICELIE-1

14:10-14:14

ICELIE2025-000011. Best practice for mechatronics curriculum development: A project-based learning approach. Guoyuan Li, Robert Skulstad

14:14-14:18

ICELIE2025-000002. Interactive and Complementary Simulations for Distance Learning of Inductive Power Transfer Systems. Jesus Acero, Ignacio Lope, Claudio Carretero

14:18-14:22

ICELIE2025-000007. Experimentation with Remote Laboratories within the In4Labs Open-Source Platform. Carlos Rejón, Antonio Robles Gómez, Sergio Martin

14:22-14:26

ICELIE2025-000017. Embedding Green and Digital Competences in

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Engineering Curricula Through IoT-Driven Demonstrative Activities. Alberto Cruz-Ruiz, Carlos Gilarranz-Casado, Alejandro Leo-Ramirez, Vicente Garcia-Alcantara, José Álvarez, Bernardo Tabuenca

14:26-14:30

ICELIE2025-000022. Multi-Perspective Design of Undergraduate Student Experiment on Analog Modulation and Demodulation Technology. Kazuhiro Umetani, Eiji Hiraki, Masataka Ishihara

14:30-14:34

ICELIE2025-000027. Interactive Whiteboards in Education: A Systematic Review with Emphasis on Technical and Higher Education Contexts.

Katarzyna Grobler-Dębska, Rafał Mularczyk, Jerzy Baranowski

14:34-14:38

ICELIE2025-000038. Trust in Online Education: A Comparative Analysis of Student and Teacher Perspectives. Giancarlo Iannizzotto, Anna Rusina

14:38-14:42

ICELIE2025-000020. Integrating Optoelectronic Sensor into Education: A Framework for Student-Driven Environmental Monitoring. Souhail Fatimi, Nikolaos Papanikolaou, Mohammed Rhiat, Kamal HIRECH, Abdellah Touhafi

14:42-14:46

ICELIE2025-000021. Integrating Printed Sensors and IoT into Electrical Engineering Education: A Practice-Oriented Course. Nikolaos Papanikolaou, Souhail Fatimi, Mohammed Rhiat, Kamal HIRECH, Abdellah Touhafi

14:46-14:50

ICELIE2025-000039. Empowering Engineering Education with the Robot Operating System (ROS): An Open Source Platform for Robotics Learning. MUTAZ RYALAT

14:50-14:54

ICELIE2025-000029. Teaching reproducible research in Industrial Electronics with Project TIER. Jerzy Baranowski, Waldemar Bauer, Kacper Jarzyna

14:54-14:58

ICELIE2025-000019. Back to Reality – Competence Mapping and Improvement in the Frame of the Engineering Mathematics Education. Imre Kocsis, Peter Korondi, Boglárka Burján-Mosoni

14:58-15:02

ICELIE2025-000014. Design and Control of 1-Degree Laboratory Helicopter System. Mohammad Atif Siddiqui, Mohd Zaid, Syed Adnan Akhtar, Mohd Uvais

15:02-15:06

ICELIE2025-000008. Development of an Advanced High-Speed Line-Following Robot for Enhancing Autonomous Robotics. Husam A. Neamah, Lu Xiaodong

15:06-15:10

ICELIE2025-000026. Project-based unified Control Theory educational curriculum for Mechatronic Engineering Master's students. Gyula Korsoveczki, Yara Elkamshoushy, Peter Korondi

Castilla

S33-I-TT01-4 - Electric Machines and Industrial Drives

A Sustainable Approach to Magnet Thermal Class Selection

Considering Irreversible Demagnetization Hossein Shirzad, Farshid Mahmouditabar, Libing Cao, Nick Baker

Thermal Analysis of an Induction Machine with Stator Inter-turn Fault

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for Real-time Emulation *Koteswara Rao Alla, Amir Kermanizadeh, Pragasen Pillay*

Design and Analysis of an N-S-Iron Interleaved Consequent-Pole

Permanent Magnet Machine with Flux Barriers *Qiyun Zhang, jiyao wang, Yongkang Zhang, Youkang Hu, Wei Xu*

Algebraic Design of a Discrete-Time Angle Tracking Observer *Lukáš Zezula, Petr Blaha*

Improved Sliding Mode Based Demagnetization Fault Tolerant Control for IPMSM Drives *Runze Guo, Aida Ye, Suneel Kommuri*

Experimental Validation of Torque Ripple Suppression Mechanism in Magnetic-Geared SR Motor and Simulation of Novel Control Method without Current Sensors *Keigo Iwaki, Kenji Nakamura*

An Open-End Winding Nine-Phase Induction Motor Drive with Reduced Inverter Legs *Tukaram Alias Saurabh Dhavjekar, Siva Kumar Keerthipati*

Decentralized Current Control for an Open-Winding Synchronous Machine with Local Estimation of the Electromotive Force *Simon Houzet, Antoine CIZERON, Alaa Hijazi, Ali Makki, Christian Martin*

Initial Rotor Position Estimation Method for Synchronous Reluctance Motor under Various Rotational Speed Conditions *Sota Takizawa, Sari Maekawa, Takahiro Minari, Hiroki Tohuku, Taizo Yamamoto*

Integrated Field-Weakening and MTPA Control with Adaptive Overmodulation for IM Drives *Ondrej Lipcak, Jan Bauer*

Loss Segregation Method For Converter-Fed Induction Machines Based On Experimental Testing *Matias Tiihonen, Shoaib Ahmed, Lassi Aarniovuori, Hannu Kärkkäinen, Markku Niemelä, Janne Nerg*

Load Angle Control of Magnetic Gears for Preventing Pole-slipping Phenomenon *Yuto Tsukiji, Kohei Aiso, Kan Akatsu, Aoyama Yasuaki*

Development of an Intensive Air Cooling Method for Electrical Machines Using Direct Cooling Technology *Lukas Veg, Martin Skalicky, Michal Freisleben*

Multi-Frequency Cascade Disturbance Observer For Harmonic Mitigation in PMSM Drives *Mingjin Hu, Wei LIU, Zekai Lyu, Shuangxia Niu, K.T. Chau*

Doblon

SYP Forum

Segovia

S35-R-TT01-2 - Electric Machines and Industrial Drives

Chairs: Zhitai Liu

Vibration Cause Diagram Applied to Induction Machines: A Graphical Tool for Root Cause Analysis of Magnetically Induced Vibrations *Allan de Barros, Constantin Schepe, Bernd Ponick*

MTPA Control Strategies During Pole Change in Multiphase Induction Motor *Taito Matsumoto, Momoka Kobayashi, Shinji Doki, Masashi Kobayashi*

Intermodulation-based Sensorless Control of Induction Machines Using Rotating Hf-Signal Injection Considering Inverter

Nonlinearities *Peter Gangel, Eduardo Rodriguez Montero, Markus Vogelsberger, Thomas Wolbank*

Fault Diagnosis of Rotor in Three-Phase Induction Motors Using Current Physical Components *Mariana Pelisson, Murillo Garcia Gentil, José Pedro Barbosa Neto, Alessandro Goedel, Marcelo Castoldi, Wesley Souza*

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A Current Stabilization Control Method for High-Speed Linear Induction Motor Based on Offline Historical Data Self-Learning *Jiafu Zhang, Fei Xu, Zixin Li, Fanqiang Gao, Liming Shi, Yaohua Li*

Torque-Sharing Strategy for Reduced Copper-Loss in a Vector-Controlled Dual-Induction Motor Drive *Shayak Chaudhuri, Keerthi R Gopan, Amit Jain*

Dual FOC of Slip-Ring Induction Motor using Fuzzy Logic Control *Lalitendu Sekhar Barik, Himanshu Misra*

Robust dq-Frame Alignment in Indirect RFOC of Induction Motors under Parameter Variations by means of a Super-Twisting Sliding Mode Observer *Rokhaya sow, KADER Zohra, Stéphane Caux, Maurice FADEL, Wenceslas Bourse, Frederic Bach*

Escudo

S41-I-SSGT-18 - Advanced Management and Integration Techniques for Storage and Renewable Energy Systems

Chairs: Hui Zhao, Anas Karaki

Resistance Estimation of Current-Limiting Fuse for Active Control of Pyrofuse in DC Circuit Interruption Device *Taichi Nakano, Reon Sasaki, Yasuhiro Takada, Wataru Ohnishi, Yasushi Yamano, Yuki Inada*

A Balanced Self-heating Approach for Battery Modules Based on Multi-winding Transformer *Xiaofang Liu, Jiye Han*

A virtual sensor fusion approach for state of charge estimation of lithium-ion cells *Davide Previtali, Daniele Masti, Mirko Mazzoleni, Fabio Previdi*

Retrieved Braking Energy in the Tram Way Via Electric Vehicle Chargers *Adnan Khan, Paolo Guglielmi, Enrico Pons, Roberto Re, Alfredo Felix Cota*

Online Parameter Identification for Supercapacitors Balancing System under Constant Current Conditions *Zhan Yi, Kelong Su, Heng Li, Hui Peng, Yihan Li, Yun Zhou*

A Comparative Study of Battery Degradation Cost Modeling in Residential PV-Battery Systems for Day-Ahead Optimization *Cheikh Elkebir Sidi Lekhel, Rita Mbayed, Hossein Nourollahi Hokmabad, Oleksandr Husev, Oleksandr Velihorskyi, Eric Monmasson*

Experimental analysis of the performance impact of zero-volt operation on commercial sodium-ion cells *Matthew Smith, Dan Gladwin*

Influence of Cell Position on the Capacity of Retired Batteries:

Experimental and Statistical Studies *Marwan Hassini, Colette Mints-Eya, Eduardo Redondo-Iglesias, Pascal Venet*

Quantile-Based Short-Term Probabilistic Forecasting of Solar PV Power Under Data Loss *Saloni Dhingra, giambattista gruosso, Giancarlo Storti Gajani*

Experimental Analysis of Cell Voltage Imbalance and Balancing Efficiency in Stationary Battery Systems *Daniel Breuer, Constantinos Sourkounis*

Dynamic Heterogeneous Flow applied to the Three-Dimensional Wind Farm Simulation Model SWiPLab-WFM *Vile Kipke, Constantinos Sourkounis*

Non-Invasive Identification of Half-Cell Open-Circuit Potentials for Advanced Battery Electrochemical Models *Sergi Obrador Rey, Eibar Flores, Simon Clark, Andrés Bernabeu Santisteban, Lluc Canals Casals, Lluís Trilla*

Current control of grid-forming doubly-fed induction machines under

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	grid phase jumps <i>Andre Thommessen, Christoph Hackl</i> Investigation of the Effectiveness of AI-based Wake Steering in a Small Wind Power Plant <i>Philip Krajinski, Constantinos Sourkounis</i> Analysis and Design of Hand-in-Hand Fractional-Stage Conversion Non-Isolated Bidirectional Converter for Battery Storage Application <i>Fengfu Yang, Yubin Duan, Yue Liu, Hongfei Wu, Yan XING</i> Inter-State Smooth Synchronization Control With Reduced Transformer Neutral Burden for a 3P4W Grid-Tied DFIG-SPVA-BES Distributed System <i>Subhadip Chakraborty, BHIM SINGH, Bijaya Ketan Panigrahi, Ambrish Chandra, Kamal Al-Haddad</i>
16:30-18:30	Escorial S47-I-TT13-2 - AI Applications in Control, Mechatronics and Robotics Chairs: Christoph Hackl, Kyunghwan Choi Accurate Inertia Control of Grid-forming Converters based on DDPG <i>Yongtae [Yongtae]</i> Automating Motor Predictive Maintenance (PdM) by real-time Explainable AI (XAI) and Deep Learning <i>Omer Ali, Mohamad Khairi Ishak, Anum Hussain, Lizy Abraham, Ashraf Bani Ahmad</i> Constrained Optimization-Based Neuro-Adaptive Control (CONAC) for Synchronous Machine Drives Under Voltage Constraints <i>Myeongseok Ryu, Niklas Monzen, Pascal Seitter, Kyunghwan Choi, Christoph Hackl</i> Pseudo-labels guided fault diagnosis method of rotating machinery at extremely low labeled rate <i>Yinghao Zhao, Xu Yang, Jian Huang, Jiarui Cui, Xian Zhou, Jingjing Gao</i> LMI-based Neural Network Observer for State and Nonlinearity Estimation <i>Yeongho Jeong, Kyunghwan Choi</i> Exponentially Convergent Nash Equilibrium Seeking: A Two-Layer Adaptive and Fully Distributed Event-Triggered Approach <i>Kaijie Zhang, Wangli He</i> Uncertainty-Aware Self-Localization for Bulldozers Using Machine Learning with Internal Sensor Data <i>Hikaru Sawafuji, Ryota Ozaki, Takuto Motomura, Toyohisa Matsuda, Masanori Tojima, Kento Uchida, Shinichi Shirakawa</i> LSTM-AE-Based Control Signal Protection and Cyber Attack Detection <i>Xixing Xue, Dong Zhao</i> ZapSortBot: Autonomous robotic sorting of used batteries utilizing deep learning <i>Youssef Barkay Molimi, Daphiny Pottmaier, Jared Mayers, Syed Khalid, William Navaraj</i> A New Approach for Consensus Control with Multi-Agent Reinforcement Learning <i>Yue Yang, Qiang Lu, Fengmin Yu, Fan Yang</i> Economic Model Predictive Control of Time-Varying Nonlinear Systems Using Transformer-based Koopman Operator <i>Minghao Han, Minh Thu Hoang, Ryan Rui En Tan, Xiaojie Li, Xunyuan Yin</i> Deep Reinforcement Learning Adaptive Droop Control of Grid-Connected Solar Farm in Grid Forming Mode with Grid Support Capability <i>Osarodion E. Egbomwan, Shichao Liu</i> Self-Attention Transformer Based Short-Term Load Prediction for Electrical Distribution Feeders <i>Xingjian Jiang, Shichao Liu, Chunsheng Yang</i> Optimization Method for Ultrasonic Shock Wave Signal Gain Based on Time - Reversal Mirror <i>Yupeng Liu, Jiahui Wen, dong xu, Marco Rivera, Patrick Wheeler</i>

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Model Predictive Control for PMSM Fed by Three-Phase Single-Stage Differential Boost Inverter *Yushan Liu, Xiangkai Feng, Yupeng Liu, Baoming Ge, Marco Rivera, Patrick Wheeler*

Hidalgo

S43-I-SSGT-1 - Advanced Predictive Control and Optimization for Power Electronics and Electric Vehicle Systems

Chairs: Vitor Monteiro, Mattia Ricco

CCS-MPC with Nestorov Accelerated Gradient for CHB Converters with Faults in the Power Cells *Fernanda Carnielutti, João Victor Lopes Rosa, Margarita Norambuena, Mokhtar Aly, José Rodríguez, Humberto Pinheiro*

Surrounding Vehicle-Aware Predictive Torque Distribution for Dual Motor Electric Vehicles *Yuxuan Cai, Jun Peng, Shaokun Li, Zhaosheng Qiu, Yue Wu*

Real-Time Predictive Control for Energy Self-Sufficiency in PV-Battery Microgrids with Bidirectional Electric Vehicle Integration *William David Chicaiza Salazar, Javier Gómez, Miguel Ruiz-López, Danilo Herrera, Abraham M. Alcaide, Sergio Vazquez, Juan Manuel Escaño, Carlos Bordons*

Indirect Model Predictive Control for Capacitor Energy Control in Modular Multilevel Converters *Leonardo Testa, Petros Karamanakos, Christoph Hackl*

Optimized Power Management in Hybrid Lithium-Ion Storage Systems via Nonlinear Predictive Strategies *Paula Arias, Marc Farrés, Alejandro Clemente, Lluís Trilla*

Analysis and Application of the Generalized Predictive Control in a Photovoltaic DC-DC Boost Converter *Luz Mariana Viramontes-Espinoza, Mario González, Víctor Cárdenas, Ricardo Alvarez-Salas*

An Efficient Model Predictive Control Design Method for Grid-Connected Distributed Generation Inverters with LCL Filter *Mokhtar Aly, Fernanda Carnielutti, mustafa abuzaher, alaaeldien hassan, Margarita Norambuena, Ahmed Shawky, José Rodríguez*

Adaptive Positive-Negative Inertia-Emulation Control for Grid-Connected and Interlinking Converters *Julen Paniagua, Itsaso Iraeta, Eneko Unamuno, Jon Andoni Barrena, Salvador Ceballos*

Harmonic Modelling of a Grid-Forming Inverter in Stationary Frame *Diego Cifelli, Andres TARRASO, Maximilian Prasser*

Study of the dynamics of a grid-connected photovoltaic inverter based on the B4 topology *Enric Torán, Marian Liberos, Ivan Patrao, Raul Gonzalez-Medina, Gabriel Garcerá, Emilio Figueres*

Integrated Charger with Smooth Switching between Buck and Buck-Boost mode Using Universal Propulsion System Structure *Jiadong Lu, Xuewen Zhao, Xingxing Sun, Wei Zhang*

Optimal Modulation for Meeting Grid Harmonic Limits Under Bounded Voltage Disturbances *Shirin Rahmanpour, Petros Karamanakos, Tobias Geyer, George Papafotiou*

SVM²PC With Extended Kalman Filter For Parameter Estimation For Grid-Tied Inverters *Frederico Bo, Fernanda Carnielutti, Freddy Flores-Bahamonde, Humberto Pinheiro*

Impact from Black-Box Small-Signal State-Space Representation on Participation Factors Analysis *Louis Arbogast, salvatore d'arco, Jon Are Suul, Mario Paolone*

Harmonic analysis technique for CSB (Cluster Stream Buffer) in

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Modular Multilevel Converter and correlation analysis between harmonic voltage and insulation strength *Chan-Ki Kim*

Toledo

S45-R-TT07-1 - Transportation Electrification and Automotive Technologies

Chairs: Hadi Kanaan

Carbon-Aware Charging Strategies for Electric Vehicle Battery Swapping Stations *Lingdong Zhou, Zuzhao Ye, Nanpeng Yu*

Modelling and Integration Analysis of High-Power Charging Stations Equipped with a MWh Scale Battery Bank *Abuzar Akhtar, Ahmed Saleem, Dong Liu, Lassi Aarniovuori*

Cost-Efficient EV Routing and Charging Using Real-Time Traffic and Dynamic Pricing *Md Shahed Hossen, Thiago E. Alves de Oliveira, Dariush Ebrahimi*

Joint optimization of high-power charging and battery swapping technology *Rasmus Suojansalo, Lassi Aarniovuori, Pia Lindh, Pasi Peltoniemi*

A Multifunctional Current-Fed Quad-Active Bridge Converter for On-Board Charging and Auxiliary Power in HESS-Based EVs *Rajat Kumar Shukla, Dipankar Saha, Baylon Fernandes*

Methodology for Estimating On-Board Circuit Parameters for Communication-Free Primary Side Control in Wireless Chargers *Kukkala Satya Prakash, Chandrasekhar Perumalla, MUDIMINCHI AKHIL YADAV*

A Novel Unified Converter for Onboard Charging and Traction Application for EVs *Sayan Mukherjee, Moumita Das*

Time-Varying Current Charging Strategies for Lithium-Ion Batteries in Electric Vehicles: Trends, Challenges, and Opportunities *Ali Rezaei Aghoy, Javad Ebrahimi, Majid Pahlevani, Alireza Bakhshai*

El Jardin

IES TC Meetings

Tapices

S46-I-SSGT-13 - Intelligent Management and Advanced Conversion for Storage Systems and Microgrids

Chairs: Mahajan Sagar Bhaskar

Online Reinforcement Learning Approach for Real-Time Energy Management of Battery Storage Microgrid System *XIANGRU SHI, Flavie Didier, Abderrezak Badji, Sheikh Izzal Azid, Maurizio Cirrincione, Salah Laghrouche*

Decentralized Energy Trading Management in Microgrid: A Blockchain Framework with Price Negotiation Protocols and WattCoin *hexiao LI, Jaafar Gaber, Salah LAGHROUCHE*

A Hybrid Battery Sorting Framework Integrating Improved K-means Clustering and ConvNeXt Classification *Jian Wu, Mingqiang Lin, Alexandre Ravey, Fei Gao, Daniela Chrenko*

A Hybrid PSO-UKF Framework for Accurate State-of-Charge Estimation in Metal Hydride Hydrogen Tanks *AMINA YAHIA, djafar chabane, Salah LAGHROUCHE, Abdoul N'DIAYE, Abdesslem DJERDIR*

Multi-time-scale Ensemble Learning for Remaining Mileage/Day Prediction of Electric Buses *Shilong Zhuo, Heng Li, Yongcai Ma, Yue Wu, Yu Jiang, Weirong Liu*

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Two-Dimensional Degradation Model of PEM Fuel Cells Considering Pt Catalyst Evolution for Health-Aware Energy Management ZHUANG TIAN, Zhongliang LI, Rachid OUTBIB, Daming Zhou

Practical EIS-Based Diagnostics for Lithium-Ion Battery Packs: Insights and Challenges Usama Tariq Khan, Muhammad Ahmad Iqbal, Ijaz Haider Naqvi, Nauman Ahmad Zaffar

Stability-aware Adaptive Trajectory Planning for Intelligent Heavy Trucks in Complex Scenarios ZHIGEN NIE, Xiongjun Luo, Antonella Ferrara

Multiscale convolution model for long-term aging prediction of PEMFC Bingxin Guo, Yang Yang, Wenlong Yang

Reliability Study of Grid-Forming Energy Storage Systems with Coupled Thermal Runaway and Long-Term Capacity

Degradation Wenlong Yang, WENCHAO ZHU, Changjun Xie

Comparison of Voltage Balancers for DAB Converters in Bipolar

Residential DC Microgrids Edivan Laercio Carvalho, Riccardo Mandrioli, Rosa Anna Mastromauro, Dmitri Vinnikov

Non-Isolated Buck-Boost Converter with Wider Voltage Gain, Reduced

Switch Voltage Stress, and Positive Output Voltage Vitor Pires, Daniel Foito, Armando Cordeiro, Joaquim Monteiro, Pedro Pereira, Joao Martins

Operation of an Interlinking Hybrid Distribution Transformer Alvaro Carreno, MARIUSZ Malinowski, Marcelo Perez, Jun Cheng, Zhihong Zhao

FCB-MPC-Based Cycle Skipping Control For Soft-Switched Isolated

AC-DC Converter With Reduced Inductors In PFC Stage Parham Mohseni, Oleksandr Husev, Dmitri Vinnikov, Matthias Kasper, Gerald Deboy, Naser Vosoughi Kurdkandi

Switched-Capacitor Resonant DC-DC Converter with Differential Power Processing for Stacked Servers in Data Center

Applications Niwton Gabriel Feliciani dos Santos, Edivan Laercio Carvalho, Andrii Chub

A Dual-Input Partial-Power Boost Half-Bridge DC-DC Converter with Integrated Transformer for Efficient Battery Integration in DC

Microgrids Neelesh Yadav, Andrii Chub

Robust LMI Control Design of a Quadratic Buck Converter Freddy Flores-Bahamonde, Carlos Torres-Pinzon, Oscar Danilo Montoya, Alireza Davari

Galeria

S48-R-TT14-2 - Control Systems and Applications

Chairs: Youming Zhang, Chengbin Ma

Adaptive event-triggered control for resource-based auto-scaling of an uncertain distributed fog computing platform Dinsha vinod, Jing Zhou

A generic observer-based control system for three-phase parallel active power filters Christoph Götsberger, Christoph Hackl, Dietmar Fehrenbach, Marek Galek

Multi-Rate Sampled-Data Control for Quarter-Vehicle Active

Suspension Systems Based on Input Delay Approach Du Xiong, Chuan-Ke Zhang, Ji Tian, Jing-Yi Jiao, Yong HE

Tightly-coupled INS/CNS/PNS integrated navigation based on adaptive multi-model fusion Taihang Chen, Qian Zhao, Xu Lidan, Teng Zhang, Pengwei Hu, Xiao Zhang

Discrete-time Sliding Mode Control of PMSMs for a Household

Appliance Eleonora Brasili, Gianluca Ippoliti, Giuseppe Orlando, Luigi Fagnano

Quick Response Valve for 3DOF Active Control of Pneumatic Vibration

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Isolation Tables Kazuki Goto, Koki Hattori, Kohei Hashimoto, Ichiro Kishimoto, Takafumi Koseki, Wataru Ohnishi

Resilient control of a small drone to man-in-the-middle

cyberattacks Alexandru Codrean, Octavian Stefan, Ramona Roxana Pascalau, Zsofia Lendek

Different Methods for Multi-HESS Voltage Recovery in Microgrids: A Comparative Investigation Tuohan Xiao, Chathura Wanigasekara, Don Gamage, Dongze Li, Akshya Swain

Comendador

S49-I-ICELIE-2

16:30-16:34

ICELIE2025-000012. EngiBot: An AI-Based Tutoring System for Personalized Learning in Engineering Education. Bárbara Rodrigues, Rui Pinto, Gil Gonçalves

16:34-16:38

ICELIE2025-000013. An AI-Powered Learning Analytics Dashboard for Real-Time Student Performance and Motivation Monitoring. Luís Cabral, Rui Pinto, Gil Gonçalves

16:38-16:42

ICELIE2025-000024. AI in Education: A Comparative Study of Intelligent Systems and Their Impacts on Modern Learning Environments. Saloni Dhingra, giambattista gruosso, Giancarlo Storti Gajani

16:42-16:46

ICELIE2025-000025. Using RAG with Multi-Modal LLMs for Precise and Accurate Assessments for Engineering Education. Usman Zafar, Sertac Bayhan

16:46-16:50

ICELIE2025-000018. Advanced Laboratory Setups for Education on Electric Motors Commissioning. Jose Antonino Daviu, Jose E. Ruiz-Sarrio, Dunai Larisa, Israel Zamudio, Jose Ochoa-Medina

16:50-16:54

ICELIE2025-000041. Online-Enabled Two-Site Competition-Based Learning for Power Electronics Circuit Design: A Case Study of Undergraduate Education Conducted Jointly by Two Universities. Masataka Ishihara, Kazuhiro Umetani, Eiji Hiraki

16:54-16:58

ICELIE2025-000015. System Control Engineering Laboratory Exercise for Clinical Engineer Education. Shinichi Kawaguchi

16:58-17:02

ICELIE2025-000045. Exploring the Role of Semantic Web Technologies and Ontologies in the Digital Education Ecosystems for Education 4.0. Claudia-Melania Chituc

17:02-17:06

ICELIE2025-000036. Adoption of Gen-AI in Engineering Education: Evidence from a U.S.-Mexico Border Region. Dennis Molina-Quiroz, Itzel Núñez-López, Julio A. Calderón-Ramírez, José A. Núñez-López, Fernando Lopez-Medina, Cesar Sepulveda Valdez, Ruben Alaniz-Plata

17:06-17:10

ICELIE2025-000034. Teaching Electric Machine Fundamentals with Interactive Simulations: A Case Study in Dynamic Visualization and Learning Outcomes. Carlos Madariaga, César Gallardo, Camila Neves, Werner Jara, Jose E. Ruiz-Sarrio, Maykop Perez, Juan Tapia, Jose Antonino Daviu

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17:10-17:14

ICELIE2025-000037. Developing an AI Assistant Platform for Electrical and Electronic Engineering Courses in Universities. Riku Takahashi, Yukihiisa Suzuki, Keiji Wada

17:14-17:18

ICELIE2025-000042. Current Status of Power Electronics Education in Industry–Academia Collaborative Programs for Human Resource Development in Advanced Semiconductor Technologies. Eiji Hiraki, Nobuyuki Kasa, Hiroya Sato, Masataka Ishihara

17:18-17:22

ICELIE2025-000028. Diamond: the DC motor drive module in the GEMS Erasmus+ project. Yongpeng Li, Sachin Yadav, Jianning Dong

17:22-17:26

ICELIE2025-000043. Iterative Improvement of a Virtual Laboratory for Biomedical Training. Russell Primeau, Peihua Han, Yanran Cao, Guoyuan Li

17:26-17:30

ICELIE2025-000030. Polytopic model and control of a friction-enhanced quarter vehicle (education of datadriven modelling). Dániel Nemes, Robert Mikuska, Sándor Hajdu, Peter Korondi

17:30-17:34

ICELIE2025-000046. Development of a flexible and reconfigurable custom-designed prosthetic arm for Mechatronic educational purposes. Gyula Korsoveczki, Krisztian Bence Kupecz, Yara Elkamshoushy, Claudia Valeria Velasquez Diaz, Peter Korondi

Castilla

S42-I-TT02-4 - Power Electronics and Energy Conversion

Chairs: Alberto Pigazo

Loss Analysis of the Clamping Circuit in an IGCT-Based High Step-Up Resonant DC transformer *Yiqing Ma, Jialiang Hu, Bin Cui, Xueting Tang, Hongjie Gong, Jiaqing Yan, Biao Zhao*

Expansion of 3-Shunt Current Measurement through Voltage Vector Distortion *hyunwoo Lee, Jaehyoung Gu, Seunghun Choi, Sanghoon NAM, Jongwon Choi*

Modeling and Suppression of Transient Voltage Interference in Magnetic Field-Based Current Sensors *Changbao Xu, Zhaohui Jiang, Mingyong Xin, Houyi Zhang, Aozu Luan, Shuai Shao*

Neural Network Based Current Harmonic Predictions Using PCC Voltage Measurements in Distribution Networks *Ranasinghe Hewage Nilani Sandya Jayathissa, Firuz Zare, Simon Denman, Amir Taghvaia, Dinesh Kumar, Maryam Haghighat*

A Bipolar Hybrid Symmetrical Cockcroft-Walton Voltage Multiplier for High-Voltage DC Power Supplies *Sara Baldisserri, Riccardo Mandrioli, Gabriele Neretti, Mattia Ricco, Andrea Cristofolini*

State Space Reconstruction-based Stability Control Design Method of Single-phase Inverters *Mingbo Wei, Hong Li, Jiangwei Hu, Kuang Zhang, Mengfan Zhang*

Advancing Brushless Motor Drives with GaN Devices: High Efficiency and Cost-Effective Solutions for Household Refrigeration *Andrea Spampinato, Gianluigi Forte, Luigi Danilo Tornello*

Multi-fidelity kriging for dimensioning multi-winding magnetic coupler *Floran Cassin, Eric Labouré, Adrien Mercier, Jeanne-Marie*

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Dalbavie, Patrice Gomez

Attaining Arbitrary Load Independent Voltage Gain and Minimizing Inverter VA Rating in S(C)-S(C) Compensated Wireless Power Transfer Links *Andrey Vulfovich, Georgios Orfanoudakis, Martin Mellincovsky, SATISH NAIK BANAVATH, Riccardo Mandrioli, Alon Kuperman*

Efficiency Advantage of Supercapacitor-Assisted Multi-Inverter Systems: Experimental Results of a Four-SCA-Inverter System *Chamila Anuradha Naligama, Nihal Kularatna, Alistair Steyn-Ross, Kosala Gunawaradane*

Evaluation of Silicon Carbide Power MOSFET on Third-quadrant Surge Current Performance *Ning Wang, jianzhong Zhang, Yaqian Zhang, Shuai Xu, fujin Deng*

Resonance Investigation for Single-Stage Current Source Inverters in Electric Drives Applications *Giovanni Luca Fidone, Emilio Carfagna, Giovanni Migliazza, Fabio Immovilli, Emilio Lorenzani*

AI-Based Approach for Exploring Power Electronics Employing Reinforcement Learning *Patrick Mederitsch, Johann Kolar, Uwe Drofenik*
A Complementary Dual-Coil Receiver Design for Misalignment-Robust Wireless Power Transfer in Electric Vehicles *Zongrui Yang, Io-Wa Lam, Yuanchao Wu, Chi Fong Jeong, Chi-Seng Lam*

Analysis of PT-Symmetric-Based IPT systems with Relay Coil *Zhihao Guo, Xiaohui Qu, Jinghang Liu*

Solar Power Based Subsea Docking Station for Wireless Charging of AUVs *Abhishek Singhal, ASHUTOSH RAI, Tummuru Narsa Reddy, G. Shrikanth Reddy*

Doblon

SYP Forum

Segovia

S44-R-TT01-3 - Electric Machines and Industrial Drives

Offline Parameter Identification for LCL-Equipped High-Speed PMSM Drives *Dingkuan Xu, Yunkai Huang, Yu Yao, Fei Peng*

Robust Control of DC-Link Voltage for PMSG Based on High-Order Extended State Observer *Luwei Shao, Rui Zhong, Wei Hua, Yinfeng Hu*
A General Single-Current-Feedback Model Predictive Control for High-Speed PMSM with High Dynamic Behavior *Chenyu Song, Yunkai Huang, Dingkuan Xu, Yu Yao*

Performance Analysis of High-Frequency Model of Electric Drive System under Different PWM Strategies *Fawzy Abdo, Daan Deruyter, Mehmet Gulec, Kotb B. Tawfiq, Peter Sergeant*

Design of Rotor Banding Sleeve Considering Loss and Thermal Behavior for High-speed Flywheel Generator *Li Shan, Xun-Tao Ren, Jia-Yu Zhang, Zhi Yang, Jia-Nan Sun, Yuhan Ye*

Implementation Analysis and Evaluation of Phase-Error-Free Discrete-Time Model for Induction Motor High-Speed Drive under Various Operating Conditions *FANG ZHIFA, Shinji DOKI*

Seamless Transition Strategy for Multi-Mode PWM in Two-Level Inverter-Fed High-Speed Drives *Adithya Harithas Venkatesh, Andreas Schnell, Amin Hashemi-Zadeh, Stefan Goetz*

Modified Forward-Euler Discrete-Time Model for High-Speed Permanent Magnet Synchronous Machine Control *Andreas Schnell, Aiswarya Balamurali, Joachim Boecker, Oliver Wallscheid*

Escudo

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S50-I-SSGT-19 - Optimization and Advanced Characterization for Renewable Integration and Battery Systems

Chairs: Bushra Canaan

Adaptive C-rate method for accurate cell-to-cell characterization in rechargeable batteries *David Ansean, Eduardo Redondo-Iglesias, Enrique Ernesto Valdés, Omar Balfas, Juan Carlos Viera, Victor Manuel García*

A Two Stage GA-MILP-based Sizing Optimization Method for Off-grid Integrated Energy System *Peng Li, Yigeng Huangfu, Shengrong Zhuo, Shengzhao Pang, Chongyang Tian, Sheng Quan*

Battery Pack Data Imputation Technique For Dynamic Profiles *Joaquin de la Vega Hernandez, Jordi-Roger Riba, Juan Antonio Ortega Redondo*

Optimal Day-Ahead Scheduling of Large-Scale Renewable Energy Bases in Desert for Cross-Regional Power Delivery *Jiajun Qin, Fang Fang, Xin Tian*

Market-oriented Two-stage Joint Optimization Strategy for Virtual Power Plants Considering Renewable Forecasting Errors *Yigeng Huangfu, Xiao Hong, Shu Gao, Zelong Zhang, Yuhua Du, Xiangyu Kong*

Energy Management of a Hybrid Energy System for Dynamic Load Compensation *Faheem Ijaz, Priya Singh Bhakar, Shamsodin Taheri, Edris Pouresmaeil*

Reduced-Order Dynamic Model of PMSG Wind Turbines for Numeral Simulation Based on Singular Perturbation *Xi Luo, Jiani Luo, Huayu Ji, Lei Yang, Dianxun Xiao*

A Comprehensive Review and Analysis of OCV Hysteresis Effects in LFP Batteries *Christiaan Fourie, Rahul Sarker, Takumi Mori*

On the Non-Minimum Phase Behavior of Pitch Controlled Wind Turbines Providing Primary Power Reserve *Tim Tölle, Benedikt Spichartz, Constantinos Sourkounis*

Control Parameters Tuning for Stability Enhancement of Grid-Following Converters in Weak Grids *Shuai Yuan, Zhixiang Zou, Quan Xiangjun*

A Hierarchical Optimization Method Based On Centralized Topology For Battery Equalization System *Guodong Zhao, Ben Zhao, Xiyuan Liu*

Age Estimation of Li-ion Batteries Based on Internal Resistance for Electric Vehicle Applications *Nima Tashakor, Ehsan Asadi Khoshouie, Amin Hashemi-Zadeh, Mohamed Mohamed, Masoud Amirreza Haradasht, Hans Schotten, Stefan Goetz*

A 5 kW Gallium Nitride String Photovoltaic Inverter with an Efficiency of 98.57% and Power Density of 1.254 kW/L *JIANG FENG, Po Xu, Yiming Wang, Kefang Zheng, Xibo Yuan, Wenzhi Zhou, Yonglei Zhang, Kai Wang*

Fish-eye camera image processing for PV production forecasting *Juan Alvarez Ordinas, Thiago Arndt, Antonella Tannous, Ferreol Binot, Bruno Francois*

Comparative Analysis of Extended and Unscented Kalman Filters for SoC Estimation in Lithium-Ion Batteries: A Model-Based Approach *ZAFER ORTATEPE*

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Comparative Analysis of Extended and Unscented Kalman Filters for SoC Estimation in Lithium-Ion Batteries: A Model-Based Approach *ZAFER ORTATEPE*

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Escorial

S56-I-TT16 - Mechatronics and Robotics

Chairs: Seiichiro Katsura

Adaptive Trajectory Optimization for Humanoid Robots Using Model

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Predictive Control in Dynamic Environments *Emre Ulu ö âZafer Bingül*
Singularity-Free and Collision-Free Optimal Trajectory Planning for Multi Industrial and Collaborative Robots in Common Workspace *Nezih Bora Yava öZafer Bingul*
Decoupled MPC for ZMP-Based Lateral Stability in Two-Wheeled Inverted Pendulum with Roll Joint *Jaewoo An, Jechan Jeon, Taehyun Kim, Myo Taeg Lim, Yonghwan Oh*
Dual-Antenna Platform for UAV GPS Spoofing Attack Detection *Junhong Wang, Xingzhe Wang, Dong Zhao, Xiang Yu, Lei Guo*
Generation of Mixing and Transporting Motion for Peristaltic Mixing Pumps by Autonomous Decentralized Control Using Local Feedback with a Discrepancy Function *Koya Tsurumi, Ryosuke Adachi, Takaaki Tanno, Fumio Ito, Tomoki Hanamura, Takuya Umedachi, Taro Nakamura*
Lubricant Temperature Observer for Gearboxes in Industrial Robots *Christian Bauer, Markus Neher, Valentin Kamm, Lukas Steinle, Armin Lechler, Alexander Verl*
Cooperative and Independent Control of Reconfigurable Multi-wheeled Omnidirectional Mobile Robot in Coupled and Decoupled States *Kento Nakajima, Kenta Nagano, Masayoshi Wada*
Performance Evaluation and Characterization of an Industrial Tactile Sensor Solution *Thomas Kammerhofer, Johannes Handler, Thomas Thurner*
Correlating Control Inputs and Web Roll Quality in a Roll-to-Roll System for Digital Twins *Juan Chowdhury, Jasper De Viaene, Jeroen De Kooning, Kurt Stockman*
Slip-aware adaptive path planning for whole-body mobile manipulators using reinforcement learning *Christian Camacho, Alvaro Prado*
Efficient UGV Tracking Using Topological Search and Spatial-Temporal Optimization *Qian Bin, Jianfeng He, Jinqi Jiang, Zhan Li*
Optimal Distance Does Not Mean Optimal Time in PCB Assembly Optimization *Zhengkai Li, Hao Sun, Yu Xinghu, Tong Wang, Zhihong Zhao, Qin Zhao, Juan J. Rodriguez-Andina, Jianbin Qiu, Huijun Gao*

Hidalgo

S52-I-SS06 - Advanced Control Techniques for Power Electronics Converters

Chairs: Hasan Komurcugil, Ugur Fesli

Voltage Support Control Strategy Based on Virtual Oscillator Control under Grid Sag Fault *Min Huang, Yecheng Lin, Kangan Wang, Haoning Cheng, Zhilei Yao, Weimin Wu*
Enhancing Power Converter Efficiency with Reinforcement Learning-Based PWM Control *Gopal Mondal, Steffen Limmer, Daniel Hein*
Stator-flux-oriented induction generator control for applications with slim DC-link capacitor *Christian Vorobev, Sebastian Bock, Matthias Gorski, Volker Staudt*
Optimized Control Strategy for LCL-Filtered Three-Phase Voltage-Source Converters in Adverse Grid Conditions *Ahmad Ali Nazeri, Jens Friebe, Peter Zacharias*
A New Three-Level Reduced Switch-Count Three-Phase F-type Rectifier and Its Control Without Current Sensing *Hasan Komurcugil, Naki Guler, farzaneh bagheri, Sertac Bayhan*
A Novel Independent AC and DC Predictive Control Strategy for an LC-filtered Multilevel Inverter *Josue Andino, Diego Arcos-Aviles, Francesc Guinjoan*

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Multiobjective impedance-based control for a TNPC-based rectifier for dc-link supplying *Juan Jose Perez, Francisco Huerta, Gonzalo de los Rios, Santiago Cobreces, Daniel Santamargarita, Emilio J. Bueno*

Lightweight Neural Network Architectures for Robust Data-Driven Current Control of Three-Phase Voltage Source Inverters *Oswaldo Menendez, Carlos Pizarro, Alvaro Prado, Gabriel Tabilo, Alex Navas Fonseca, Felipe Ruiz, José Rodríguez*

Systematic Polynomial-Based Modulation Method to Enhance Operation of DAB converter *Alba Rodriguez, Abraham M. Alcaide, Jose I. Leon, ANDRES BARRADO, Joaquin Vaquero, Yann Bouvier, Carlos Pavon, Alejandro Stowhas*

DC Plasma Power Supply with Multi-port Solid State Transformer and Inverse Model Predictive Control *Ali Sharida, Anas Karaki, Sertac Bayhan, Haitham Abu-Rub*

Design and Thermal Analysis of a High-Voltage High-Frequency Transformer *ALI SHAN, Mehmet Akif Ozdemir, Bunyamin Tamyurek, emrullah aydin, Timur Aydemir*

Design and Evaluation of Different Order Sliding Mode Control Strategies for Current Control in T-Type Grid-Tied Inverters *José Ángel Chacón, Abraham M. Alcaide, Wensheng Luo, Jose I. Leon, Ramon Portillo, Leopoldo G. Franquelo*

Inductor-Less Direct AC-DC Conversion for Electromagnetic Vibrational Energy Harvester *Md Mahmudul Hasan, Sandipan Patra, Shafi Khadem*

Four-Port SST-Based Multi-Objective Control for Hybrid PV-Battery Powered Data Centers *Anas Karaki, Ali Sharida, Sertac Bayhan, U ÷ W" FESL, Haitham Abu-Rub*

Layered Self-Protection Architecture for Grid-Forming Inverters *Markel Zubiaga Lazcano, Alain Sanchez-Ruiz, Ander Ordone, Javier Rodriguez-Gongora, Ekhi Zugasti*

Finite-Set Simplified Model Predictive Control for Thyristor-Controlled LC-Coupling Hybrid Active Power Filter *Wai-Kit Sou, Rui Martins, Chi-Seng Lam*

Toledo

S54-R-TT02-5 - Power Electronics and Energy Conversion

Matching Network Design for a Class D PA Driving Multiple Coils in MHz Wireless Power Transfer *Shuang Li, Ruihan Ma, Yu Xiao, Zhan Liu, Ming Liu, Chengbin Ma*

Ground-to-Chassis Distance Adaptive Photovoltaic Inductive Wireless Power Transfer System for Electric Vehicles *Io-Wa Lam, Zongrui Yang, Chi Fong leong, Pui-In Mak, Rui Martins, Chi-Seng Lam*

Frequency Control of S-LCL Wireless Power Transfer Using Parity-Time Symmetry Theory *Ryota Aratani, Yuki Shimizu, Yoshitaka Kawabat*

The Behaviour of a Capacitive Wireless Power Transfer System with an Arbitrary Number of Repeaters *Hamed Farbaksh, Arthur Cloet, Michael Kleemann, Ben Minnaert*

Unified and Systematic Design for High-Efficiency Class-EF² Wireless Power Transfer Systems *Yuga Ihara, Xiuqin Wei, Weisen Luo*

A State-Space Eddy Current Model for Hybrid Inductive-Capacitive Wireless Power Transfer Systems *Baptist Elst, Ben Minnaert*

A 6.78 MHz Class :cWireless Power Transfer System for Enhanced Drone Charging Flexibility *Antti Jormanainen, Nam Ha-Van, Jorma Kyyrä*

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El Jardin

S57-I-SS41 - Novel Developments for Special Robots and Vehicles in Complex Scenarios

Chairs: Zhan Li, Zhang Chen

A Lightweight Collision-Inclusive Trajectory Planner for UAV *Ning Chen, Sichen Yang, Yipeng Yang, Zhan Li*

Energy-Efficient Trajectory Tracking for Novel Hybrid UAV via Deep Reinforcement Learning *Wenhao Wang, Jixiao Liu, Yipeng Yang, Zhan Li, Huanpu Liu*

Autonomous Drifting of Single-track Two-wheeled Robot with Deep Reinforcement Learning *Yifan Sun, Feilong Jing, Yang Deng, Jin Gu, Zhang Chen*

Vehicle Trajectory Prediction with Driving Style-Aware Spatial-Temporal Fusion Network *Zhiwu Huang, Yicong He, guoyu gu, Heng Li, Yutao Chen, Yongjie Liu*

Joint Identification Method of Extended Kalman Filter and Cascaded Flatness-Based Observer for Lateral Tire-Road Friction of

Motorcycle *chen yang, Bao Ke, Yang Deng, Yiyong Sun, Lu Weining, Liang Bin*

Uncertainty-Aware GNN for Collaborative Robot Mapping Towards 6G-Enabled Smart Warehouses *Irfan Fachrudin Priyanta, Julia Freytag, Tobias Körner, Muhammad Asfandyar Khan, Jérôme Rutinowski, Moritz Roidl, Ilona Rolfes, Alice Kirchheim*

Sequential Intention-driven Vehicle Trajectory Prediction Integrated with Spatial-Temporal Features *Zhiwu Huang, Zhuozhuo Zhang, Zini Wang, Heng Li, Yingqi Wang, Yongjie Liu*

GMVC: Grip-Force-Modulated Adaptive Velocity Mapping for Intuitive Robot Teleoperation *Haolin Fei, Ziwei Wang, Liucheng Guo, Darren Williams*

An Unmanned Tilttable Narrow Reverse Tricycle Vehicle for Uneven Terrain Travel *Xingan Liu, Zhang Chen, Guang Zhai, Hailong Liu, Yiyong Sun, Bin Liang*

TEWD-DFO: A Soft-Soil-Aware Driving Force Observer Using Terramechanics-Enhanced Wheel Dynamics for Planetary

Rover *Changmin Yeo, Martin Görner, younghoon seo, Jinsong Hong, Sehoon Oh*

Tapices

S55-I-SSGT-14 - Advanced Modulation and Control Strategies for Power Electronics Converters

Chairs: Mahajan Sagar Bhaskar

Three-State Modulation Strategy for Capacitor Charging in Modular High-Voltage Pulse Generator *Sofia Velasquez, Johan Guzman, Marcelo Perez, Javier Samanes*

Investigation of Optimal Arm Configurations for a Transformerless MMC DC/DC Converter with a High Step-Down Ratio *Anna Shubnaya, Hans-Peter Nee*

Transient Stability Analysis of Enhanced Virtual Synchronization

Generator Grid-forming Control *Muhammad Abdelghany, Muntathir Al Talaq, Saikrishna Kanukollu, Ahmed Al-Durra, Fei Gao, Mohamed El Moursi*

Model Order Reduction for Capacitive Energy Transfer DC/DC

Converter Based on Harmonic State Space Theory *Geni Lin, Wei Zhang, Shuxin Zhang*

A control design for a modular boost converter featuring inductor and

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capacitor switching cells *Christopher J. Rodriguez-Cortes, PANFILO RAYMUNDO MARTINEZ RODRIGUEZ, Samuel Iturriaga Medina, Diego Langerica Córdoba, Juan Antonio Villanueva-Loredo, Jose M. Sosa-Zuñiga*

Design of a Nearly Harmonic-Free Adjustable AC Power Source With Large Range of Output Voltage *Sobhan Mohamadian, hossein azizi, Amir Ghasemian, Concettina Buccella, Carlo Cecati*

Multilevel Converter for Versatile Waveform Generation in Electroporation Applications *Borja Lopez, Hector Sarnago, Ignacio Alvarez, Jose Miguel Burdio, Oscar Lucia*

Iterative algorithm for voltage sizing of a Single Delta Bridge Cell based STATCOM *Juan José Costa-Iriarte, Mario Lopez, Pedro Izurza, Gonzalo Abad, Jon Andoni Barrena*

Fixed-point Recurrent Neural Network based Observer for Cell Voltage Estimation in Modular Multilevel Cascade Converters on FPGA Platforms *Jhonattan Berger, Jonathan Lillo, Felix Rojas, Christoph Hackl*

Comparison of the Reactive Power Range in the AC Terminals of LCC and MCC based HVDCs *Pablo Epul, Jose Espinoza, Samuel Rebolledo, Luis Vaccaro*

Introducing an Elastic Force Modulation Mechanism in the Flexible Elastic Crawler: Design and Preliminary Evaluation *Junya Nagase, Tamie Hiraga, Shuichi Wakimoto*

Galeria

S58-R-Jorn1 - Advanced Power Converters and Motor Drive Systems

Safe and Efficient Hundred-Watt-Level Wireless Power Transfer in Room-Scale Spaces Through Electromagnetic Field Optimization *Tong Li, zhe liu, Chenxi Yang, Linqing Xu*

Interleaved Switching for Loss Minimization in Adjacent Cell-to-Cell Balancing Architectures *Jyotirmaya Sahoo, Ramesh Parnapalli, Amit Patra, Siddhartha Mukhopadhyay*

A Novel Multilevel Converter as Active Magnetic Bearing Drive Based on Hybrid NPC With Flying-Capacitor Leg *Jianfu Ding, Yuanhao Xie, Dong Jiang, Zicheng Liu, Yixuan Shuai, Mingqin Zhou*

Dual Side Field Oriented Control of Slip Ring Induction Motor *Lalitendu Sekhar Barik, Himanshu Misra*

Improved SVM Pattern for Single-Stage CSI With Discharge Path in Electric Drives Applications *Dario Benatti, Giovanni Migliazza, Emilio Carfagna, Fabio Immovilli, Emilio Lorenzani*

Hierarchical Disturbance-Based Displacement Observer for Piezoelectric Self-Sensing Actuation *Shaoze Zhang, Jian Chen, Dapeng Tian*

Analysis of Volt-Second Error for Medium Voltage SiC MOSFET Power Modules *Morten Rahr Nielsen, Hongbo Zhao, Michael Møller Bech, Stig Munk-Nielsen*

Comendador

S59-I-TT08-1 - AI and Signal & Image Processing Methodologies

Chairs: Ahmed Mohamed, Askat Kuzdeuov

MAC-Net: A Multi-Scale Atrous Convolutional Network for Precise and Real-Time QRS Detection in Ultra-Short ECGs *Nannan Liu*

Ai-assisted framework for performance and quality supervision of manual assembly processes. *Luis Vilas Boas, Joaquin Dillen, João Faria,*

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Nuno Simões, Rafael Fernandes, Bruno Silva, João Borges, António Moreira

Real-Time Multispectral Human Pose Estimation *Askat Kuzdeuov, Huseyin Atakan Varol*

Multi-Dilation Convolution and Efficient Local Attention Enhanced YOLOv11 for Insulator Defect Detection *Weixing Wu, Hongxing Yuan, Chunyu Tong, Tianyu Xu, Yuliang Cai*

Multilingual Speech Command Recognition with Language

Identification *Artur Muratov, Askat Kuzdeuov, Huseyin Atakan Varol*

MEDNet: Memory-Enhanced Discriminative Feature Learning for Few-Shot Metal Defect Classification *Shi Zhen, Ruiyun Yu, Haoyuan Li*

Generative AI for Cybersecurity Awareness Training *Ahmed Mohamed Ahmed Mohamed, Mohamed Mejri*

Exploring Automotive Quality Correlations through Explainable

Machine Learning What-If Simulation *Alexandre Oliveira Júnior, José Luis Calvo Rolle, Rui Pires, Paulo Leitao*

Improved YOLOv11 for Low-illumination Object Detection in

Autonomous Driving Scenarios *zhang Kaihong, Yimin Zhou, Jun Cheng*

STSSRI-GNN: A Spatio-Temporal Graph Neural Network for Structured

Signal Modeling in Industrial Systems *Renbo Zhang, Xilin Dai, Hua Wang*

Castilla

S51-I-TT02-5 - Power Electronics and Energy Conversion

Stability Analysis and Enhancement of DC Microgrids via Observer-Based Control *Ruifang Zhang, Wensheng Luo, Sergio Vazquez, Francisco Gordillo, Ligang Wu, Leopoldo Franquelo, Guoqiang Zhang, Alvaro Castillo*

A Novel Gate-Driving Strategy for Enhancing High-Speed Switching

Performance in GaN Power Transistors *Luis F Gomez-Rivera, Quirc Perez-Farre, Alejandro Paredes Camacho, Jose Luis Romeral Martinez*

Fast and Accurate Finite Element-Based and Magnetic Equivalent

Circuit Models for Magnetically Controlled Transformers *Amr Abbas, Ahmed Hemeida, Camilo Suarez, Wilmar Martinez, Anouar Belahcen, Paavo Rasilo*

Comprehensive Modeling and Analytical Evaluation of Non-Ideal

Switching Effects in Three-Phase Two-Level Inverters *Hossein Sadegh Lafmejani, Alessandro Soldati*

Transient Current Peak Investigation in an Inverter Leg with Paralleled

GaN FETs *Salvatore Musumeci, Vincenzo Barba, Marco Palma*

A Tri-Port Thyristor Rectifier with Three Distinct Output

Voltages *Shoaib Shaikh, Faheem Shafeeqe Channar, Mohamed Diab*

Design, Implementation, and Cost Comparison of Buck-Boost with

Semiconductor-Based Isolation *Mobasshir Al Rafi, Ibrahim Amezyane, Narayan Kar, Caniggia Viana*

A Three-Coil Self-Resonant WPT System for Biomedical

Applications *Neda Zahedi Saadabad, Javad Nekoui, Reza Dehbozorgi, Qingsong Wang, Ambrish Chandra*

Experimental and Analytical Analysis of Turn-on Parasitic Oscillation

and Dynamic Current Sharing of the Si/SiC Hybrid Switch *Mohan Zhang, Ian laird, Saeed Jahdi, Wenzhi Zhou, Zhaobo Zhang, kun Wang*

Characterization of Mutual Coupling for dc-biased Controllable

Magnetic Devices *Lennart Hoffmann, Torbjörn Thiringer, Jens Friebe*

Modeling of the Inverter Current Distortion in the Double-sided LCC

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Compensation for Inductive Power Transfer Systems *Francesca Grazian, Guangyao Yu, Calvin Riekerk, Wenli Shi, Jianning Dong, Gangwei Zhu, Thiago Soeiro, Pavol Bauer*

Assisted Current Balancing of Parallel Si IGBTs by Co-Switching with SiC MOSFET for High-Current Inverter Application *Patrick Palmer, Danielle Jaye Agron, Edward Shelton*

Simultaneous Wireless Power and Information Transfer with Minimal Hardware and Multi-Carrier Modulation Using Phase Shift Control *Wanying Weng, Guoao Li, Zhecheng Zhang, Jiande Wu, Yan Deng, Xiangning He*

Doblon

S60-I-SS42 - Physics-Informed Learning for Modeling, Monitoring, and Control in Industrial Systems

Chairs: Geng Lu, Tongshuai Zhang

Physics-Informed Residual-Based Anomaly Detection and Open-Set

Recognition System: A Case Study on Ring Bearings *Enzo Nicolás Spotorno Bieger, Antônio Augusto Fröhlich, Josafat Leal Filho*

Power Electronics Parameter Estimation by Physics-Informed

Gaussian Processes *Marcel Zimmer, Edoardo De Din, Daniele Carta, Andrea Benigni*

Adaptive Electronic Fence Technology for Live Operations in Digital

Twin Substations *Liu Mengyue, Shang Jingwei*

Research on Optimization Algorithms for Alarm Data Fusion of

Multiple Network Security Situational Awareness Devices *Xiaomeng Li, Mengqi Liu, Shuozei Zheng, Tongshuai Zhang*

Dynamic Obstacle Avoidance for UAV in Logistics Warehouses Based on Unified Obstacle State Representation *Zihao Che, Changsheng Luo, Geng Lu*

Physics-Informed Online Learning of Flux Linkage Model for

Synchronous Machines *Seunghun Jang, Myeongseok Ryu, Kyunghwan Choi*

Robust Junction Temperature Estimation Using Hybrid RC Network

and Sensor-Informed MISO ARX Models *MOHAMMED RIADH*

BERRAMDANE, Alexandre Battiston, Nicolas Blet, Benjamin Remy

Multi-agent Heterogeneous Hybrid Safe Logistics Sorting System

Based on Transformers *chen cai, Geng Lu*

Control theory-informed machine learning aided stable kernel

representation for nonlinear system monitoring *Wei Cheng, Ketian Liang, Danijel Cuturic, Linlin Li, Chris Louen, Steven X. Ding*

Efficiently Modeling of Superconducting Electrodynamics Suspension

Train based on Physics-informed Neural Network *Linfeng Liu, Wei Dong, Hao Ye, Shaowei Li, Min Gu, Tongshuai Zhang*

Segovia

S53-R-TT03-1 - Power Systems and Smart Grid

Robust Nonlinear Control of an Inverter Connected to a Weak

Grid *Sebastian Gomez Jorge, Jorge Solsona, Claudio Busada, Leire C. Aguirre-Larrayoz, Ana Susperregui, Gerardo Tapia-Otaegui*

Scalable Multi-Agent Model-Free Demand Response for Voltage

Regulation in Grid-Interactive Efficient buildings *Aya Amer, Sertac Bayhan, Haitham Abu-Rub, Mehrdad ehssani*

Qualitative Review and Analysis of Present and Future Grid

Connection Challenges in Great Britain *Andrew Hutchinson, Dan*

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Gladwin, Matthew Smith, James Scott, Abdussalam Aburziza, David Fletcher

A Networked Oscillators-Based Large Signal Stability Analysis for Grid-Forming Inverter Dominated MGs *Shu Gao, Xiao Hong, Yuhua Du, Yigeng Huangfu, Aili Fan, Xiangyu Kong*

Analog-Digital System for Model Predictive Control of Grid-Connected Voltage Source Converter *Henil Shah, Anupama Kowli, Mukul Chandorkar*

A Method for Mitigating Harmonic Current Distortion under Light-Load Conditions Using an AC/DC Converter *Jihun So, Yeong-Jun Choi*

Stability Region Assessment of Power Systems with Mixed IBRs and Generators via Energy Function *Xuheng Lin, Ziang Zhang*

Small-Signal Stability Analysis of Grid-Connected Systems with Integrated Grid-Following and Grid-Forming Controlled Inverters *Zijun Ren, Xiaohui Qu, Hanwen He, Yubin Pang*

Escudo

S61-I-SSGT-20 - Advanced Control Strategies for Resilient and Integrated Energy Systems

Chairs: Hadi Y. Kanaan

Enhancing Hydrogen Energy Management with a TSN-Driven Scalable Smart Grid Architecture *Veit Wiese, Rashed Al Amin, Roman Obermaisser*

Distributed Event-Triggered Fixed-Time Multi-Agent Control for Time-Varying Resource Management in Microgrids *TINGTING ZHOU, Salah Laghrouche, Youcef AIT-AMIRAT*

Weighted EURO and CEC Efficiencies for Off-Grid Photovoltaic Green Hydrogen Production System *Hugues Renaudineau, Ana M. Llor, Catalina González Castaño, Nicolas Muller, Daniel Pesántez, Samir Kouro, José Rodríguez*

Design and implementation of an intelligent charge-discharge control system for supercapacitors *Kai Tang, Xiaoxiao Mi, Michael Basin*

A Novel Non-singular Fast Terminal Synergetic Integral Backstepping Control for Operational Enhancement of Battery Electric Vehicle *Hafiz Mian Muhammad Adil, Hassan Khan, Issam Salhi*

Design of Finite Control Set Model Predictive Controller for Modular Multilevel Converters with Common Mode Voltage Elimination *Eugene Ndoh, Marc René Lotz, Vaidehi Gosala, Saravanakumar Arumugam, Dheeraj Gosala, Chathura Wanigasekara, Soeren Ehlers*

Multidisciplinary Design of Parallel Hybrid Distributed Electric Propulsion Regional Airliners *Guanlin Fan, Haoliang Yu, Tao Lei, Shuhao Deng, Xingyu Zhang, Xiaobin Zhang*

Enhancing PINN-Based Flow Reconstruction with Sparse and Decoupled Gradient-Weighted Sensor Placement *David Emanuel Gomes, Antonio Espirito-Santo, José Páscoa*

Smart Fault Diagnosis in Grid Connected PV Systems: AI Methods Under Experimental Evaluation *Hsen Abidi, Heni Belgacem, Lilia Sidhom, Inès Chihi*

End-of-Life Prediction Models for Lithium-ion Batteries in Electric Vehicles: Approaches, Challenges and Future Directions *Ahmet Kutay Aydogan, Anas Karaki, Sertac Bayhan, Haitham Abu-Rub, Mehrdad Ehsani*

10:50-12:50

Escorial

S66-I-SS13 - Advanced Technologies of Motion Control for Robotic Applications

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Chairs: Umair Javaid, Kazuaki Ito

Neural Network-based Fractional-Order Terminal Sliding Mode Control for UAV *Yimin Zhou, Huaxing Lin*

Predefined-Time Control for Industrial Manipulator Trajectory Tracking with Parametric Uncertainties and Disturbances *Umair Javaid, Michael Basin, Wei Xu, Waqas Mehmood Baig*

Remote Operation utilizing MPC Predicted Values under Time-varying Delay *Yutaka Uchimura*

Haptic Rendering of Bone Drilling Based on Feed Rate, Rotational Speed, Depth of Cut, and Workpiece Mass Density *Daisuke Yashiro, Kohei Shimonaga, Hirohito Hirata, Tadatsugu Morimoto*

Finite-Time Control Barrier Function-Based Model Predictive Control for Safe Navigation of Wheeled Mobile Robots *Baby Diana, Amitesh Vatsa, Jaynil Nirav Sheth, Shyam Kamal*

Workspace Force Feedback Control of Parallel-Link Robots with Forward Kinematics based on an Extended Kalman Filter *Ryosuke Ito, Yuki Kiriya, Yoshiyuki Hatta, Kazuaki Ito*

Optimization of Wave Control Design for Damping of Resonant System *Mio Kanzawa, Seiichiro Katsura*

Adaptive anti-sway control for 3D overhead crane with constraints on trolley motion and payload sway *Shengzeng Zhang, Xinggao Liu, Michael Basin, Zhu Haiyue, Jun hao zhang, Xiongxiang He*

Novel Dynamic Force Shaping Method for Agoraphilic Navigation Algorithm *Dinusha Gunathilaka, Kahandawa Appuhamillage, Yousef Ibrahim, Hasitha Hewawasam, Linh Nguyen*

Temperature Rise and Loss Study for Wet Rotor Cooling Method of High-speed Permanent Magnet Synchronous Motors for Robot Joints *Feiyang Liu, Jinglin Liu, Zehua Yang*

Parameter Measurements of Permanent Magnet Synchronous Machines without Mechanical Locking *Kenneth Chinonso Odo, Pragasen Pillay*

Neural network based sliding mode event-triggered control for nonholonomic mobile robots *Jianmin Wang, Fengqiu Liu, Hongxu Zhang*

Motion Trajectory Correction Using Deep Learning for a Robot Arm in Glue-Application Tasks *Yuina Takahashi, Yoshiyuki Hatta, Junya Sato, Kazuaki Ito*

Hidalgo

S63-I-SSGT-2 - Advances in Wireless Power Transfer and Enabling Technologies for Electric Vehicles

Chairs: Kundan Kumar, Neelesh Yadav

Minimum Stress Factor Tracking Algorithm for Reconfigurable T-Type DAB DC-DC Converter *Alejandro Stowhas, Christian Rojas Monroy, Samir Kouro, Marcelo Perez, H. Alan Mantooth*

Simulator for Dynamic Wireless Power Transfer Reproducing Urban Traffic Patterns from Sharing Data *Tokikazu Mizuguchi, Yutaka Shikauchi, Osamu Shimizu, Hiroshi Fujimoto, Masashi Tomari, Hajime Seya*

Method for Reducing Standby Losses by SP-PS Circuits and Capacitor Switching in Dynamic Wireless Power Transfer *Takeru Miyairi, Weisen Luo, Takehiro Imura, Yoichi Hori*

Vehicle-to-Vehicle Wireless Power Transfer in Electric Vehicles for Input Supply Outage Scenarios *ASHUTOSH RAI, Abhishek Singhal, Narsa Reddy Tummuru, Venkata Ratnam Vakacharla*

Dynamic Wireless Power Transfer Using Common Mode Choke Coil

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and Y Capacitor Filter Design and Noise Reduction Techniques *Takato Anahara, Takehiro Imura, Yoichi Hori*

Wide-Input-Range Constant Voltage Control Strategy for WPT System Using APWM-Modulated Full-Bridge/Half-Bridge Operation *Jiajun Wu, Muxing Wu, Io-Wa Lam, Chi Fong Jeong, Chi-Seng Lam*

A Novel Orbirect Inductive Coil Structure for Wireless Inductive Power Transfer in Electric Vehicle Battery Charging Applications *Dharavath Kishan, Shubhang Chauhan, Shubhankar Ghosh, Andrii Chub*

Performance Evaluation and Experimental Validation of an Advanced PWM Method in SiC Based EV Charger *Syed Jahania Shah, Hafsa Qamar*

Adaptive EV Charging Management Using Urgency Index and Multi-objective Optimization *Xusheng Wang, Dongze Li, Abhisek Ukil, Akshya Swain*

Deep Deterministic Policy Gradient Control and Optimal for Grid-forming Converter *xuemei zheng, Yanyu ZHAO*

Research on Clamped Push-Pull Class E Amplifier for Wireless Power Transfer *Chao Qi, Yang Wang, Xiyu Mo, Qisheng Qiu, Wei Wang, Yijia Ren*

Smooth Transition Method for Microgrid Grid-Island Switching Based on Hybrid Control Strategy *Chao Qi, Qisheng Qiu, Yang Wang, Yifan Huang*

Adaptive Multi-sensor Information Fusion for Monitoring Systems with Disturbances *Zhihong Zhang, Dundun Liu, Tianyuan Ma, Jiaming Wang*

Adaptive Integral-Type Non-Singular TSMC for Buck Converters with Zero-Crossing control Gain under Matched and Mismatched Disturbances *Wei qi Zhang, Chuanyu Sun, Kai Song, Jiatong Zhang*

Electrical Design of Large-Scale Public Buildings with Energy Management *Wei Li, Che Chen, Wei Li, Yuzhuo Liang*

Toledo

Panel Grid Stability

The dynamic behavior of the electric grid is shifting rapidly as inverter-based resources (IBRs) replace traditional synchronous generators in providing critical system services such as frequency regulation, voltage support, and stability margins. While promising new control strategies—especially grid-forming inverters—are under active development, their large-scale deployment introduces new system-wide dynamics that challenge conventional planning and stability assessment frameworks.

This panel brings together experts from academia, national labs, and industry to share emerging insights into the stability of IBR-dominated grids. A key thread will examine how to bridge the gap between device-level design and system-level performance through advanced analytical tools. The panel aims to highlight the multidimensional nature of stability challenges through technical presentations and interactive dialogue and to foster cross-community collaboration between power electronics and power systems professionals.

Panelists:

Phil Hart, Ph.D., Senior Engineer, GE Vernova Advanced Research Center, Niskayuna, NY, USA

Yin Sun, Ph.D., Grid Technology Program Manager, Shell, Netherlands, Shell

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Projects & Technology, The Hague, Netherlands
 Muhammad Bakr Abdelghany, Ph.D., Assistant Professor, Minia University, Egypt
 Qianwen Xu, Ph.D., Associate Professor, KTH Royal Institute of Technology, Sweden
 Chairs: Ziang "John" Zhang, Ph.D., Associate Professor, Binghamton University – State University of New York, Binghamton, NY, USA.

El Jardin

S67-I-SS47 - Smart Sensors, Sensor Networks, and Standards for IoT Applications

Chairs: Riccardo Brama, Victor Huang

Universal Discovery of Connected Things *Riccardo Brama, Peter Waher*

Quality-aware Sensors Positioning in Smart Cities: Enhancing

Coverage in IoT-driven Urban Scenarios *Gabriel S. Barreto, Thiago Jesus, Daniel G. Costa, João Catalão*

An Artificial Intelligence Tool for Generating IEEE 1451 Transducer

Electronic Data Sheet *Reza Abrishambaf, Helbert da Rocha, Daniele Buonocore, Vincenzo Paciello, Antonio Espirito-Santo*

Harmonization Model & Implementation of Interactions among IoT

Devices *Eugene Song, Peter Waher, Helbert da Rocha, Riccardo Brama, Hiroaki Nishi, Thomas Roth, Antonio Espirito-Santo*

IEEE 1451-based Digital Twin Framework for Real-Time Monitoring and

Control of Smart Homes *Eugene Song, Shanaka Abeysiriwardhana, Hiroaki Nishi, Thomas Roth*

Embedded AI for Intelligent Wildfire Monitoring: A Multi-Sensor and

Vision-Driven Approach *João Bittencourt, Thommas Kevin Sales Flores, Thiago C. Jesus, Daniel G. Costa, Ivanovitch Silva*

Dependability-Driven Planning of Wireless Sensor Networks for Smart

Cities Using Machine Learning *Thiago Jesus, Thommas Kevin Sales Flores, João Bittencourt, Ivanovitch Silva, Daniel G. Costa, João Catalão*

Experimental test from an IoT sensor in a bidirectional wireless power

transfer for electric vehicles *Francisco Javier de Larriva Serrano, Aurora Gil-de-Castro, Joaquin Garrido-Zafra, Antonio Moreno-Munoz, Javier Vázquez, Emilio José Molina-Martínez, Pedro Roncero-Sánchez*

Tapices

S65-I-SSGT-15 - Learning-Based Energy Management for Sustainable Energy Systems

Chairs: Shichao Liu, Mo-Yuen Chow

A Collaborative Framework Based on MLLM for Generalization

Photovoltaic Fault Diagnosis *mengqi han, Bo Yang, qi liu, Mingxuan Cai, Yuxiang Liu*

Digital simulation of lithium-ion batteries under Overcharging

conditions *Joelton Deonei Gotz, José Rodolfo Galvão, Fernanda Cristina Corrêa, Milton Borsato, Alceu de Souza Brito Junior, Alceu André Badin*

Enhanced Sequence-to-Sequence NILM Learning using Convolution

Variational Auto-Encoders *Yacine Belguermi, Gilles Hermann, Patrice Wira*

Estimating SOC for Second-life batteries using embedded neural

network *Joelton Deonei Gotz, André Gustavo Hochuli, Alceu de Souza Brito Junior, Alceu André Badin*

Time-aware VAE offline reinforcement learning energy management for electric vehicles *Fei Li, Yu Jiang, Yongcai Ma, Yue Wu, Heng Li,*

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Shilong Zhuo

Å WKVA Memory-Efficient Model for Time-Series Prediction of Greenhouse Temperature and Energy Loads Masaki Sakayori, Hiroaki Nishi

Coordinated Fourth-Order Multi-ESO Intelligent Control with Adaptive Virtual Impedance in Microgrids: Disturbance Recognition and Suppression Jingyuan Lu, Abhisek Ukil, Akshya Swain

Bio-inspired Hierarchical Equalization Strategy for Multi-microgrid Energy Storage Battery Packs Qianhui Ma, Abhisek Ukil, Akshya Swain

Adaptive Selective Harmonic Elimination Based on Neural Networks with Indirect Model-based Online Training Cristóbal Cortés, Felix Rojas, Christoph Hackl, Javier Pereda Torres

Galeria

S68-R-Jorn2 - Converter Systems, Stability, and Advanced Control

Generalized Envelope-Based Modeling of Single-Phase Grid-Connected Power Converters Francisco Azcondo, Alberto Pigazo, Christian Brañas, Paula Lamo, F. Javier Díaz, Rosario Casanueva

Delay-dependent Stability Evaluation for Temperature Control Load Participating in Load Frequency Control of Microgrid Chenguang Wei, Xing-Chen Shangguan, Yong HE, Chuan-Ke Zhang, Da Xu

Three-Phase Phase-Locked Loop Based on Terminal Sliding Mode for Grid-Connected Inverters Pooyan Alinaghi Hosseinabadi, Hemanshu Pota, Saad Mekhilef, Georgios Konstantinou, Michael Negnevitsky, Sobhan Mohamadian

Model-free Multi-phase AC Signals Downscaling Method Using Orthogonal Phase-lock Autoencoder and Circular Harmonic

Decomposition Xing Qi, Tingting Qiu, Lassi Aarniovuori, Qian Zhang, Jiazi Xu, Wenping Cao

Adaptive Coordinated Control for Nonlinear PEM Fuel Cell Air Supply Systems Nana Fan, Xiaoyu Guo, Chenliang Wang, Zhen Dong, Lu Liu, Jun Yang

Online Robot Navigation Using Discrete Waypoints via Time-Varying Guidance Vector Fields Longze Zhao, Jianan Wang, Fuxiang Liu, Kewei Xia, Qingbo Yu, Hongwei Guo

Characteristic Identification of Flow Control Valves Based on Data-Model-Fusion in Actual Industrial Scenarios Mingliang Cui, Xin Ma, Youqing Wang, Jianyong Tuo, Tongze Hou, Jingfeng Zhao

Distributed Optimal Control Strategy for DC Microgrid with MPPT-Controlled Distributed Generations Ziqing Xia, Mei Su, Zhangjie Liu, Yue Wu, Xiaochao Hou

Comendador

S69-I-TT08-2 - AI and Signal & Image Processing Methodologies

Chairs: Claudia-Melania Chituc, Dimitar Ninevski

KPU-Net: Kernal Point Unet for 3D LiDAR Ground

Segmentation Harindra Sandun Mavikumbure, Victor Cobilean, Swagat Das, Chathurika Wickramasinghe, David Barton, Lynn McDaniel, Devin Drake, Chuck Kirby, Milos Manic

A Two-Stage Electrode Refinement Method with Denoising Diffusion for Automated Segmentation and Overhang Analysis on Battery X-ray Images Shiyu Lu, Tianyu Wang, Chun Cao, Mian Li, Yunlong Huang, Songhua Zhang

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Instrumentation and Methods for the Computation of Borehole

Trajectories and their Uncertainties *Dimitar Ninevski, Paul O'Leary, Anika Terbuch, Negin Khalili, Daniel Mevec, Robert Fruhmman, Michael Habacher*

A High-Performance FPGA Implementation of MI-BMNet *Daniel Enériz, Diego Antolín, Nicolás Medrano, Belén Calvo*

Feature Adaptive Selection and Fusion Network for Small Object Detection in Traffic Perception *ABDULHAMID IBRAHIM, QIANCHENG ZHAO, Haoyuan Li, RUIYUN YU*

A method for the grading and recognition of osteoarthritis X-ray images based on the MED-HED detection *Shengwu Yang, Zhilong Yu, Kai Huang, Jinbao He*

Evaluating Robustness of 3D Gaussian Splatting-Based 6D Camera Pose Refinement Under Degraded Conditions for Lightly Textured Industrial Synthetic Objects *Sunil Choudhary, Nicolas Ragot, Vincent Havard, Yohan DUPUIS*

Varying Roll Radius Measurements in a Web Processing Machine using Low-Cost Vision and Sub-Pixel Processing Techniques *Yentl Thielemans, Jeroen De Kooning, Guillaume Crevecoeur, Jos Bruggeman*

Scalable Unsupervised Segmentation via Random Fourier Feature-based Gaussian Process *Issei Saito, Masatoshi Nagano, Tomoaki Nakamura, Daichi Mochihashi, Koki Mimura*

Design and Training of a Sound Classification Model on a Resource-Constrained Edge Device for Fruit Theft Prevention *Haruki Endo, Hideaki Yajima, Leow Chee Siang, Tsutomu Tanzawa, Koji Makino, Kazuyoshi Ishida, Hiromitsu Nishizaki*

Castilla

S62-I-TT02-6 - Power Electronics and Energy Conversion

Chairs: Davide Barater, Alberto Pigazo

Semi-scalable Three-Phase Inverter Equipped with a Current Unfolding Topology Using a Discontinuous Conduction Mode *Tomoyuki MANNEN*

Variable Switching Frequency PWM for Hybrid 4-leg Three-level FC-NPC Inverter with Flying Capacitor Voltage Ripple *Chujun Li, Dong Jiang, Chengjun Li, Donghao Liu*

A Two-Sample-based Delayed Signal Cancellation Operator for Three-Phase Phase-Locked Loops *Alberto Pigazo, Paula Lamo, Francisco J. Azcondo, Christian Brañas, Rosario Casanueva, F. Javier Díaz*

Simultaneous Wireless Data and Power Transfer Testing onboard the Nanokhod Microrover Tether Mechanism for Lunar Surface

Exploration *Robin Sauerzapf, Moritz Gewehr, Weizhou Ye, Andreas Schneider, Sabine Klinkner, Nejila Parspour*

DC Capacitor Sizing Methodology for Three- and Four-Wire Static VAR Generators *Josue Andino, Milan Prodanovic, Javier Roldan-Perez*

Design and Analysis of a Low-Inductance DC-Link Busbar for 3.3 /kV SiC MOSFETs Using Partial Inductance Method and 3D FEM

Validation *Shahedul Alam Talukder, Ramkrishan Maheshwari, Thomas Ebel, Ruman Kalyan Mahapatra, Nicklas Christensen*

A Capacitor-coupled SEPIC and gVBased Successive Folding Inverter for PV Systems *Abhrodip Chaudhury, Anandarup Das*

Efficiency Improvement by Double-Sided Halbach Array Coils in

Magnetic Resonant Coupling Wireless Power Transfer *Takayuki Oba, Ryo Haneda, Takahiro Nozaki*

Practical considerations for inductance measurement in high power

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three-phase inductors *Pablo Moreno-Torres Concha, Jaime Poblaciones, Ivan Ruiz, Antonio Lazaro*
Integral Control for Low-Power EV Wireless Charging: Modeling and Experimental Results *Fernando Quiroz-Vazquez, Víctor Cárdenas, Mario González, Gerardo Espinosa-Perez*
EMI prediction based on datasheet parameters for hard-switched Si, SiC, and GaN MOSFETs *Jon Aranguren, David Garrido Diez, Iosu Aizpurua, Iban Barrutia*
A Parameter Estimation Methodology for a Three-Winding High-Frequency Transformer *Ali Arshad, Giuseppe Bossi, Alfonso Damiano*
Collaborative Direct Model Predictive Control for Back-to-Back Converters with Fast Power Response and Higher DC-link Voltage Stability *Yunzhe Xiao, Sheng Huang, Wu Liao, Shoudao Huang*

Doblon

S70-I-SS46 - Security Communication and Control of Distributed Networked Systems under Malicious Cyber-attacks

Chairs: Haibo Cheng, Bushra Canaan

SHIELD: Security against Harmful Prompt Injection Evaluation and Language Detection Leveraging Ensemble Approach *Martin Esugo, Oluwatobi alao, Haitham Mahmoud*
Distributed Optimal Power Generation for an Open Price-based Energy Management System *Peize Du, Yuxuan Liu, Zhisheng Li, MAOJIAO YE, Lei Ding*
Privacy-Preserving Algorithm for Multi-Party Secure Localization Integrating CRT and Zero-Sum Noise *Sunkang Lin, Shengming Chang, Antong Wang*
An Image Encryption Algorithm Based on the Encoding of Four Symbols and Hexagram for Networked Visual Control Systems *Xia Li, Dajun Du, Yi Zhang, Yang Xiao, Minrui Fei*
Distributed Set-Membership Estimation for Networked Systems based on Topology Adaptation *Mingyang Luo, Yilian ZHANG, Xianwen Zhou, Dan Zhang*
P4-IDet: A Programmable Switch-Based Framework for Real-Time and High-Accuracy Traffic Anomaly Detection in ICPSs *Jiayu Luo, Zhengyan Zhou, Qiaoxiong Tang, Ruohan Chen, Xiang Chen, Di Wang, XUN ZHOU, Chao Pei, Yinan Zhang, Wenwen Zhang, Qiang Yang, Wenhai Wang, Haifeng Zhou*
Multi-Threshold False Data Injection Attack Detection Method based on Interval Estimation *Jieli CHEN, Yilian ZHANG, Xianwen Zhou, Qinqin FAN*
Fully Distributed Adaptive Dynamic Event-Triggered Estimators Incorporating Internal Variables in Multi-Agent Systems *Huimin Wei, CHEN PENG, Min Zhao*
A bidirectional trust management framework in fog computing based on improved subjective logic and probabilistic linguistic term set *yan wang, Zhigang Wang*

Segovia

S64-R-TT03-2 - Power Systems and Smart Grid

Review of Machine Learning for Power System Transient Stability: From Assessment to Constrained Optimal Power Flow *Tassneem Zamzam, Haitham Abu-Rub, Sertac Bayhan, Miroslav Begovic, Ali Ghrayeb*

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Distributed Finite-Time Secondary Frequency control and active power sharing for Islanded AC microgrids with time delays *Ahmed Lotfy, yong chen, Chengwei Pan, Esam H.Abdelhameed*

A Bidirectional Power Router for Traceable Multi-energy Management *Shiu Mochiyama, Ryo Takahashi, Yoshihiko Susuki*

Extending the Generalized Bode Criterion to Black-Box Power Systems: A Practical Approach for Stability Evaluation *Asier Aristondo De Miguel, Salvador Ceballos, Alain Sanchez-Ruiz, Robert Grino*

A Data Driven Inertia Estimation Method for Inverter Based Resources *Xue Hu, Qin Wang, Yan Tong, Yafeng Zhao*

Considering Resource Availability in Control of Dynamic Virtual Power Plant Used for Provision of Frequency Restoration Reserve *Marco Vinicio Avendaño Caiza, Juan Diego Ríos Peñaloza, Javier Roldan-Perez, José Luis Rodríguez Amenedo, Milan Prodanovic*

Escudo

S71-I-SSGT-21 - Advanced Power Converter Topologies and Control for Electrified Transportation and Grid Integration

Chairs: Riccardo Mandrioli, Satish

Optimized Interleaved Synchronous Buck Converter Design for a Two-Stage 3.6 kW Auxiliary Power Module in Electric Vehicles *Kyle Kozielski, Sreejith Chakkalakkal, Kamal Vaghasiya, Kartikeya Babhuta, Wesam Taha, Alex Wang, Aniket Anand, Mehdi Narimani, Ali Emadi*

A Two-Stage Isolated DC-DC Architecture for EV Auxiliary Power Module *Pedro Lobler, Wellington Volz, Ademir Toebe, Cassiano Rech, Luciano Schuch*

Modular DC/DC Converters for Fuel Cell Multi-Stack Systems in Heavy-Duty Applications *Ines SIAD, Alexandre Battiston, Thomas LEROY, Serge PIERFEDERICI*

Wide Output Voltage Range Three-Phase Bidirectional Non-Isolated Hybrid AC/DC Converter *mengchen duan, Shuo Wang, Junjun Deng, changhong shao, David Dorrell*

Comparative Study of Buck Control Techniques for Current-Fed Series Resonant Converters in Wide Voltage Gain Range Applications *Salman Khan, Andrii Chub, Dmitri Vinnikov, Matthias Kasper, Gerald Deboy*

Design and Analysis of a Type-II Compensator Controlled Dual Active Bridge Converter for DC Fast Charging *V.S.R. Varaprasad Oruganti, Kushan Lulbadda, Ruvini De Seram, Tarlochan Sidhu, Sheldon Williamson*

Analytical Dual-Phase-Shift Optimization for Reactive Power Minimization in Dual Active Bridge Converters under Light-Load Conditions *Sayed Hamidreza Mousavi Tabar, Javad Ebrahimi, Alireza Bakhshai*

Consensus-Based SoC Balancing Strategy for Reconfigurable Lithium-Ion Battery Packs *Heng Li, Lina Yuan, Cui Li, Ziqi Zhang, Fu Jiang*

Physical-Layer Data Carrier Encrypted based Talkative Power Converters *Keming Liu, Guoao Li, Wanying Weng, Jiande Wu, Xiangning He*

Event-Triggered Distributed Secondary Control for VSG-Controlled Grid-forming Converters *Guangdi Li, Yaodong Zhang, Bowen Zhou, Zhaoxia Xiao, Jiande Wu, Rai M. Naidoo*

A Hybrid Feedforward Harmonic Mitigation Strategy for Inverters under Islanded Operation *Yao Li, Wenbo Zhu, Abhishek Kumar, R. C. Bansal, R. M. Naidoo, Yan Deng*

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	Pulse Train Control Strategy for Single-Phase Differential Boost Inverter Based on Discontinuous Modulation Strategy <i>Hao Qin, Wenbo Zhu, Yi Wang, Yan Deng, Abhishek Kumar, Ramesh Bansal</i> A Modular Equalizer with AC-Coupled Series Connection for Distributed Cell-to-Cell Balancing <i>Guoao Li, Wanying Weng, Keming Liu, Zhecheng Zhang, Jiande Wu, Xiangning He</i> Analytical Voltage Optimization Method for DC Railway Networks with Wayside Energy Storage System <i>Julian Rojas, Pavol Bauer, Sebastian Rivera</i> Onboard Energy Storage Systems for Resilient Operations During Electrified Railway Power Supply Failures <i>James Scott, David Fletcher, Dan Gladwin</i> Discrete-Time Control Design of a Battery Charger for Electric Vehicle Applications <i>El Nouha Mammeri, Oswaldo López-Santos, Abdelali El Aroudi, Luis Martinez-Salamero</i>
14:10-16:10	Escorial S77-I-TT15 - Instrumentation, Sensors, Actuators and Micro-Nano Technology Chairs: Kenta Nagano, Mohamad Idris Wani A Bipolar Current Excited 3-Wire Measurement System For Remote Resistive Sensors <i>Mohamad Idris Wani, Meraj Ahmad, Tarikul Islam, Shahid Malik</i> Vehicle Sensor Configuration Optimization for Tire Force Estimation based on Min-Max SDP <i>Xu Ge, Mingming Zhang, Zhou Jianhua, Weilun Chen, Xin Li, Mian Li</i> Optimization of Stage Surface Roughness for Residual Water Drainage and Machine Vision-Based Crack Detection Without Deep Learning <i>KyungHoon Kim</i> Optimized Design of High Uniform Bi-Planar Coil for Miniaturized NMRG Sensor <i>Jinguo Mu, Zihao Lyu, Bowen Liu, Weiqian Wang, Xiaoxuan Xie, Xiangyang Zhou</i> Double Helix-Based Actuator for 2-Degree-of-Freedom Motion <i>Sigrid Aadnesgaard, Sampath Jayalath</i> Workspace-Independent Chatter Stability in Clip-Type Hybrid Milling Machines: Experimental and Theoretical Insights for High-Speed Applications <i>Jinming Qi, Dan Zhao, xia Li, Yuhang Yang, ping Gong</i> Representation of Jacobian Matrix Using Computational Graphs And Its Applications <i>Hironori Gunji, Takashi Kusaka, Takayuki Tanaka</i> Spectral Characterization of Nonlinear Load Torque Effects in Linear Tooth Belt-Driven Systems <i>Kwinten Mortier, Jeroen De Kooning, Niko Nevaranta, Tuomo Lindh, Kurt Stockman</i> Nonlinear Model for Torque Estimation Based on Frequency Characteristics of Geared Actuator <i>Kazuto Wakatsuki, Kenta Nagano, Masayoshi Wada</i> Low-frequency Vibration Shaker with High Output Force Based on Giant Magnetostrictive Actuator <i>Yikun Yang, Dongjian Xie, Yue Feng, Tian Xia, bintang Yang, Haomin Wu</i> Hidalgo S73-I-SSGT-3 - Advanced Energy Management and Stability Control for Electrified Transportation and Microgrids Predictive energy management for fuel cell trucks with an adaptive

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frequency-decoupling solver *sha sun, Fan Yang, BO CHEN, YanSiQi GUO, Jiacheng Zheng, Yang Zhou*

A Bi-Level Energy Management Strategy for Multi-Stack Fuel Cell Systems in Hybrid Electric Vehicles *YanSiQi GUO, Ruiqing Ma, Yang Zhou*

A virtual DC machine control strategy for enhancing the stability of four-switch Buck-Boost converters under constant power loads *Xuehao Liu, Wentao Jiang, Rui Ma, Hao Bai, Yang Zhou, Jiawei Chen, Ruoxuan Quan, Peiyao Xiong*

Optimal Sizing Algorithm of Multi Source Hybrid Power System for Unmanned Aerial Vehicle *Fei Cao, Wentao Jiang, Rui Ma, Yang Zhou, Hao Bai, Jiawei Chen*

A Novel Adaptive Distributed Coordination Control Strategy with Virtual Inertia Enhancement for Hybrid AC/DC Power Systems of MEA *Xiangke Li, Jinxu Yang, Zhang Hang, Wentao Jiang, Xin Zhao, Xiaohua Wu*

Fast Electrochemical Impedance Spectroscopy Detection and Fault Diagnosis of PEMFC Based on Discrete Interval Binary

Sequences *Yuxuan Lin, Haoran Ma, Zhirui Guo, Yang Zhou, Hao Bai, Rui Ma*

Physics-Informed Neural Network Based Large-Signal Stabilization Control Algorithm for a DC-DC Converter *Shengzhao Pang, Heng Liu, Siyu Zhao, Haoyu Wang, Yingxue Chen, Bo Cheng*

An Advanced Voltage Control Strategy for Three-Phase Rectifier with Unbalanced AC Voltages in More Electric Aircraft Power

System *Qingxuan Zhang, Peiyao Xiong, Jiaxin Bai, Ruoxuan Quan, Xuehao Liu, Fei Cao, Wentao Jiang*

Large-Signal Stability Analysis of Hybrid Energy Storage System Based on Estimation of Domain of Attraction *Jiaxin Bai, Peiyao Xiong, Xuehao Liu, Wenjie Ao, Jiawei Chen, Wentao Jiang*

Mass-based voltage optimization method for MV distribution networks in electric propulsion aircraft *Zhihao Min, Jose Matas, chen liu, Tao Lei, Weilin Li, Josep Guerrero*

Thermo-Electrical Digital Twin-Assisted Aging Assessment of SiC Mosfet in Switching-Cell-Array Power Converters *chen liu, Alber Filba-Martinez, Jana Soler-Lazaro, Sergio Busquets-Monge, DAVIDE BARATER*
Consensus Algorithm Based Control Strategy for Stable Operation of Multi-microgrid System with Battery Equalization *Qianhui Ma, Abhisek Ukil, Akshya Swain*

Zero Harmonic Distortion Technology for Next-Generation Lite MVDC Distribution Systems *Dener Brandao, Arthur Fialho, Gabriel Ramos, Thiago Parreiras, Igor Amariz Pires, Braz Cardoso Filho*

Optimal Pulse Pattern with Reduced DC Current Ripple for Modular Multilevel Converter *diego verdugo naranjo, Felix Rojas, José Ignacio Gajardo*

Dual-Adaptive Control Strategy for Grid-Connected Inverters Under Wide Range Grid Impedance Variations *Jingyuan Lu, Abhisek Ukil, Akshya Swain*

Toledo

S75-R-TT02-6 - Power Electronics and Energy Conversion

A Novel Single-Phase Interleaved-Based Three-Level PFC Rectifier *Vitor Monteiro, Frede Blaabjerg, Joao Afonso*

Impact of Digital PWM Carrier-Related Baseband Distortion on Parallel

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Converters *Sibulele Mtakati, João de Oliveira, Elisabetta Tedeschi*
Component Parameter Estimation of Interleaved Boost Converter with Linear Approximation Model *Hidenori Maruta, Shota Watanabe, Hiroyuki Yoshino*
A interleaved Buck Boost converter for the battery energy managment in marine vehicle *Guillaume Pellecuer, Thierry Martiré, Loïc Daridon*
Sensorless Feedforward Current Sharing Control for Interleaved Totem-Pole PFC Converter *LiPan He, ZheYuan Li, Han Wei, Hao Ma*
Modeling and Control Strategies of Interleaved Converters with Coupled Inductors Based on Pseudo-decoupling Method *Wei Li, Zhouzhen Hu, Ruikun Yang, Jose I. Leon, Abraham M. Alcaide, Xiaojun Shen*
Enhanced Dynamic Response of DC-AC Converters in Shipboard Microgrids Using Non-linear PI Controller *Reza Naghash, Mustafa Alrayah Hassan, Kimmo Kauhaniemi, Hannu Laaksonen*
High-Efficient Switched-Capacitor Step-Up DC-DC Converter with Partial Power Processing *Ademir Toebe, Pedro Lobler, Niwton Gabriel Feliciani dos Santos, Rafael Beltrame, Luciano Schuch, Cassiano Rech*

El Jardin

Industry Forum 3

Tapices

S76-I-SS03 - Advanced control and image processing technology for robots

Chairs: Peihua Han, Guoyuan Li

Time-series Compensation based ADRC for Water Surface Attitude Control of Hybrid Aquatic-Aerial Robot *Hui Peng, Yiming Lin, Yue Cao, Xinting Yang, Peng Yang, Heng Li*
QCell-HM: Quantum Cellular Neural Network with Henon Map for Secure Robotic Image Encryption Processing *Wenxuan Wang, Jiaming Shi, Peng Du, Jinjing Shi*
Vehicle Following control using Transformer-based Soft Actor-Critic with Behavior Cloning *Weirong Liu, Yutao Chen, Guoyu Gu, Heng Li, Zhaoyang Li, He Yicong*
Hydrofoil Design and Control of a Hybrid Aquatic-Aerial Robot Based on CFD Techniques *Hui Peng, Peng Yang, Yiming Lin, Haoyu Li, Junhao Xiao*
Two-Stage Temporal ConvTransformer for Continuous Sign Language Recognition *Xiaoyong Zhang, yingze yang, Zhaoyang Li, Yongcai Ma, Weirong Liu, Heng Li*
RangeBlock: A multi-head attention Network for --Semantic Segmentation in Urban scenes *LiPan He*
Hierarchical Cross-Attention Mechanism for Multi-Agent Trajectory Prediction *Weirong Liu, Yingqi Wang, Hongjiang He, Zhuozhuo Zhang, Qing Xiao, Fu Jiang*
Auxiliary Loss Reweighting for Image Inpainting *Wenli Huang, Siqi Hui, Ye Deng, Xiaomeng Xin, Yang Wu, Jinjun Wang*
FUSE74 : Unified Fault Code of Heterogeneous Equipment for LLM-Based Health Management *Yingqi Wang*
Synthetic Data-Driven Augmentation for Precise 6-DoF Pose Estimation of Building Components in Automated Facility Inspections *Aristide Laignel, Nicolas Ragot, Fabrice Duval*
Improving Accuracy of Camera-based Distance Measurement by

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Active Movements of An Omnidirectional Mobile Robot *Yuto Kato, Masayoshi Wada*

Galeria

S79-R-TT14-3 - Control Systems and Applications

Chairs: Nuo Chen, Lucas Wan

Event-based H_{∞} Control for Nonlinear Hybrid Stochastic Delayed Systems Subject to Aperiodic DoS Attack *Fengqiu Liu, Mingxin Kang, Hongxu Zhang*

Frequency-adaptive pole placement for parallelized proportional, integral and resonant control systems *Christoph Götsberger, Christoph Hackl*

Control Barrier Function Construction for Systems with High Relative Degree via Level Surface Design *Takuma Harada, Yuh Yamashita, Koichi Kobayashi*

Correcting for Coupling Delays in Real-Time Co-Simulation using Iterative Learning Control *Laurane Thielemans, Jan Swevers, Roland Pastorino*

Enhanced Active Magnetic Shielding Based on High-order Extended State Observer *Shi Ziyang, Shiqiang Zheng, Haifeng Zhang, Yuxuan Li, Yunyang Lian, Zheng Tang*

Robust Finite-time Gain Convergence for Formation Maintenance under a Generalized Consensus Law *Jerome Moses Monsingh, Kiran Kumari*

Reinforcement Learning Based Adaptive LADRC for Active Magnetic Field Compensation in Magnetocardiography Systems *Zhongxiang Jing, Haifeng Zhang, Fengwen Zhao*

Comendador

S80-I-TT08-3 - AI and Signal & Image Processing Methodologies

Chairs: Maria Damanaki, Sarah Ouarab

IC-GP-HSMM: Unsupervised Segmentation of Behaviors with Individual Differences *Toshiyuki Hatta, Issei Saito, Masatoshi Nagano, Tomoaki Nakamura*

A Novel Decision-Level Knowledge-Data Fusion Method for Rock Mass Integrity Prediction *Wu Lian, Weihua Cao, Chao Gan, Yan Yuan*

Geometric Interpretation of Savitzky-Golay Filter for Defect Detection *Mario Roos Hoefgeest Toribio, Sara Roos Hoefgeest Toribio, Ignacio Álvarez García*

Contrastive Learning-Based Standard-Free Calibration Transfer for Near-Infrared Spectroscopy *Chaoting Li, DI WANG, Zheng Chaoqun, Xinyao Lu, Guohao Zong, Rui Wang, Weihua Feng, Sanying Feng*

Improving Image-Based Tool Detection in Industrial Workstations using Data Augmentation *Sarah Ouarab, David Garcia, Nicolas Ragot, Yohan DUPUIS*

Enhanced Drift-Aware Computer Vision Architecture for Autonomous Driving *Abu Ahammed, Md Shahi Amran Hossain, Sayeri Mukherjee, Roman Obermaisser*

Robustifying 3D Perception via Least-Squares Graphs for Multi-Agent Object *MARIA DAMANAKI, Ioulia Kapsali, NIKOS PIPERIGKOS, Alexandros Gkillas, Aris Lalos*

Crop Detection and Tracking Oriented for Embedded Weeding Based on YOLO-DeepSORT *Yushuo Hu, Qiang Wang, Zhanqiang Xing*

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Fine-Grained Region Perception Network for Few-Shot Defect Classification of IC Package Substrates: Benchmark Methodology and Dataset *Haoyuan Li, Ruiyun Yu, Bingyang Guo*
Powerful Goodness of Fit Test for Spectrum Sensing under Noise Uncertainty *DJAMAL TEGUIG, younes bouzegag*
Building an Operational Framework for Leaf Disease Detection *abdellah islam kafi, Antonio Sanfilippo, Sa'd Shannak, Raka Jovanovic*

Castilla

S72-I-TT02-7 - Power Electronics and Energy Conversion

Power Optimization Allocation Control for Hybrid DC/DC Converters *Chenjie Fan, Kangan Wang, Keke Yang, Lixun Zhu, Zhilei Yao, Weimin Wu*
Photovoltaic power interval prediction method based on spatio-temporal fusion diffusion model *Yishi Chen, Jinxiang Liu, Jingxin He, Qinghua Liu, Taozhan Zhang, Senlin Zhang*
Medium Frequency Transformer Optimization and Insulation Testing for Solid State Transformer Applications *Leonardo Bolzonella, Reza Mirzadarani, Mohamad Ghaffarian Niasar*
Performance Evaluation of Overvoltage Protection Devices for Cryogenic Solid-State Circuit Breaker in AEA Applications *Reza Khoshniat, Nick Wright, Peter Malkin, Mohammed Elgendy, Mark Husband, Daniel Malkin*
Physics-based Modeling of Degradation in Alkaline Water Electrolysis Cells due to Reverse Currents *Vicente Olguín Godoy, Pooya Davari, Henrik Frandsen, Frede Blaabjerg*
Adaptive Neural Network-Based PI (ANN-PI) Control for DC Microgrids in Renewable Hydrogen Production Systems *shadi khodakaramzadeh, Pavol Bauer, Hani Vahedi*
Enhanced Energy Utilization in Wind-to-Hydrogen Plant using Power Balancing Network *Aritra Basu, Liangcai Shu, Dongsheng Yang, Songda Wang, Yin Sun*
MPC and SVM Design for NPC Rectifier in Hydrogen Production Application *Tayebeh Faghihisenejani, Pavol Bauer, Hani Vahedi*
A Data-Driven Simulation-Based Case Study of The Green Village's Hybrid Energy Hub *Daan Schat, Azadeh Kermansaravi, Lidewij van Trigt, Arnoud van der Zee, Shamsodin Taheri, Hani Vahedi*
Model Predictive Control for EMS Integrating EV and Shared Storage Based on Simultaneous Optimization of EV Transport, Charging/Discharging and Trading Price *Yuito Ohno, Shinkichi Inagaki, Tatsuya Suzuki*
Reactive Power Control in Low-Voltage Grids by Unidirectional EV Chargers: A Multifunctional Vienna Rectifier Case *Augusto Matheus dos Santos Alonso, Bruno Paiva Sant'Anna, Bruno Fernandes de Oliveira*
A Three Level Interleaved DC-DC Converter for EV Battery Charging from a Residential PV System *shangkun li, Perdana Putera, Christian Klumpner, Mark Sumner, Mohamed Hajj*
A Harmonic Rotation Transformation for Three-Phase Three-Wire Applications *Daniel Memije Garduño, Jaime José Rodríguez Rivas, Oscar Carranza Castillo, Luis Avila Reyes*
Assessment of PWM Techniques for Two-Level Inverters Analyzing their Influence on DC-Link Capacitor Remaining Useful Life *Eduardo Bascur, Abraham Alcaide, Jose I. Leon, Juan Fredesvindo Ramos Delgado, Alfonso Manchado, Ramon Portillo, Leopoldo Franquelo*

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Doblon

S81-I-SS50 - Theory and Technologies on Human Factors in Advanced Human-System Environment

Chairs: Daisuke CHUGO, Yasutaka Fujimoto

Features Based Dynamic Time Warping of Multidimensional Series for Aligning Sensor Data Jiang Li, Juan Zhao, Feng Wang, Seiichi Kawata, Daisuke Chugo, Jinhua She

Data-Driven Koopman-MPC for Single-Joint Flexible Manipulators: Modeling and Trajectory Tracking Zihao Ning, Jinhua She, Seiichi Kawata
Development of Occluded Area Visualization System for Pedestrian Avoidance Using XR Tomohiro Matsuhara, satoshi muramatsu, Katsuhiko Inagaki

Fingertip Position Control Using Finger Kinematics by Functional Electrical Stimulation Miharuru Watanabe, Seiichiro Katsura

A Proposal for Skin Impedance Measurement considering Electrode Force Variations in Acupoint Localization Yuito Oodaira, Sho Yokota, Akihiro Matsumoto

A Basic Study and Impression Evaluation on Nodding Motion Parameters of Avatar Robot Misa Suzuki, Sho Yokota

A Study on a Navigation Method Based on Linguistic Information for Service Robots Shunsuke Sasaki, satoshi muramatsu, Katsuhiko Inagaki
LSTM-Based Motion Estimation for Highly Back-drivable High Torque Exoskeleton Kengo Shimizu, Yasutaka Fujimoto

Stable Haptic Shared Autonomy for Wall Landing of Two-Wheeled Drones via Control Barrier Functions Seri Tanaka, Satoshi Nakano, Gennaro Notomista, Manabu Yamada

Standing assistance robot based on the spatial distribution of standing motion patterns achievable by the remaining muscle strength of individual elderly persons asai haruki, Daisuke Chugo, Misaki Kanno, satoshi muramatsu, Ken-ichi Tabei, Jinhua She, Hiroshi Hashimoto

Segovia

S74-R-TT04-1 - Renewable Energy and Energy Storage Systems

Chairs: Muhammad Abdelghany

Lifecycle Co-Optimization of Microgrid Sizing and Operation

Considering Battery Degradation and Flexible Supplementation Qi Chen, Yingying Cheng, Fan Zhang, Jiyuan Zhang, Miao Jiang, Yanbai Shen
Module-Level Electrochemical Impedance Spectroscopy analysis for SOH monitoring of Lithium-ion Batteries Nováková Kate — Alberto Berrueta, Václav Knap, Alfredo Ursúa

Physics-Informed Neural Networks for Real-Vehicle Li-ion Battery SOH Estimation yingze yang, Yifei Sun, Xiaoyang Chen, Shilong Zhuo, Shunli Wang, Fu Jiang

The impact of constant current-pulse strategy on fast charging of lithium-ion batteries Wenhao Huang, Furong Liu, Wenxuan Yin, Xiang Cheng, Changjun Xie

Hybrid Energy Storage Power Allocation Strategy Based on Improved Kalman Filtering and Variational Mode Decomposition Jichen Gu, Wei Zhang, Binyang Lv, Liyuan Wang

Collaborative Bidding Strategy for Wind and Storage Power Plants in Dual Markets Based on Electricity Price Forecasting and Dynamic Risk Management Yuzhen Wang, Aotian Ding, Shuxin Zhang, Liyuan

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	Wang, Hongpeng Liu Optimal Scheduling of Hybrid Energy Storage for Smoothing Wind Power Fluctuations Based on Frequency Decomposition Bingnan Wang, Mingyang Cai, Zian Zhao, Shuxin Zhang, Hongpeng Liu Comprehensive Capital Cost Model for Flywheel Energy Storage Systems Christopher Bocker, Robin Weiß, Susanne Gnille, Steffen Bernet Escudo S82-I-SSGT-22 - Electric Machines and Industrial Drives Performance comparison of rotor position estimation based on HF voltage injection for IPMSM with increased signal frequencies Qian Li, Günter Schröder Nonlinear current control with optimal reference voltage saturation for electrically excited synchronous machines Niklas Monzen, Pascal Seitter, Christoph Hackl Multi-Objective Design and Optimization of a Hybrid-Dual Rotor PMSM Using Magnetic Circuit Decoupling and WTSM Strategy Farnam Farshbafrooni, Aran Shoaee, Qingsong Wang, Kamal Al-Haddad Model Predictive Control with Optimized Duty Cycle Error for Dual Three-Phase Synchronous Motors Qianwen Duan, Jiuqiang Deng, Yao Mao, Qiliang Bao Free-wheeling offline and online identification of machine back-EMF harmonics by analytically integrated angle-dependent permanent magnet flux linkage prototype functions Bernd Pfeifer, Christoph Hackl Efficient Nonlinear Torque-Slip Curve Calculation in Arbitrary (d,q)-Reference Frames based on Dense Apparent Inductance Matrices Johannes Roßmann, Christoph Hackl Experimental Evaluation of Active LC Filter Resonance Mitigation for Inverter-Fed Drive Systems Emelie Berglund, Johan Borg, Jonny Johansson Multi-Physics Neural Network Based Design Optimization of a Rotary Transformer for EESM Applications Farshid Mahmouditabar, Volker Pickert, Guilherme Fernandes, Saleh Ali A Differential Geometry-Based Sensorless MTPA Scheme for Solar-Fed Water Pumps Abirami Kalathy, Arpan Laha, Praveen Jain, Majid Pahlevani
16:30-18:30	Escorial S87-I-SS08 - Advanced Motor Drive and Control for High-Performance Robotic Joints Chairs: Chao Gong, Yihua Hu Impact of PM Bar Position and Dimension on the Electromagnetic Characteristics of Enhanced Stator PM Hybrid Stepping Motor Xiaobao Chai, Jinglin Liu, Shang maixia, Jingyuan Wang, Feiyang Liu, Zehua Yang Multi-Scale Residual Attention GAN Method for IGBT Switching Transient Data Compression and Reconstruction Xiaotian Zhang, Weiye Wang, Zechao Liu, SHENG WU, Chao Gong, Jose Rodriguez Noise-Free Sensorless Control of Robotic PMSMs Based on Variable Structure Speed Observer with Embedded Single-Waveform Injection Over Full-Speed Range Xinran Shi, Chao Gong, Hao Chen, Xing Zhao, Cheng Xue, Yihua Hu A Complex-Vector Resolver-to-Digital Conversion System with Prestage Systematic Error Mitigation Wenyuan Mi, Shaochong Xiao,

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Jincheng Yu, Hojoon Lee, Yong Chen, Hang ZHAO

Strategy for Parameter Tuning of PI Controller for PMSMs Based on Improved Particle Algorithm *Jingyuan Wang, Jinglin Liu, Yulin Yang, Xinran Shi, Shang maixia, Xiaobao Chai*

Parameter Identification Based on Deep Deterministic Policy Gradient for PMSM *Zehua Yang, Jinglin Liu, Feiyang Liu*

Low-Chattering Sliding Mode Observers Based on Sinusoidal Saturation Function and Dynamic Gain Co-optimization for Sensorless Control of Robotic PMSMs *Hao Chen, Zeyuan Gao, Linlong Peng, Xing Zhao, Saibo Wang, Yihua Hu*

Continuous Position Calculation Technique Based on the average velocity method for Vector-Control-based BLDCMs Used in Robotic Joints *Chenguang Gong, Huan Di, Siyu Wang, Saibo Wang, Jingfeng Wang, Xing Zhao*

Efficiency Analysis and Optimization of Axial Flux Permanent Magnet Motor Based on Intelligent Response Surface Method for Robots *Zeyuan Gao, Chao Gong, Jiadong Lu, Jingfeng Wang, Siyu Wang, Saibo Wang*

A control strategy for the synchronous lifting of uneven objects by joint motors of double mechanical arms based on SMESO *Cheng Wang, Jinglin Liu, Ruizhi Guan, Xiaotao Li, Yiren Chen, Zhenqi Bai*

PMSM Rotor Position Estimation via Hall Vector Filtering Phase-Locked Method *YUE LI, Ruiqing Ma, Xiong Wang, JingZhi Liang, TianTian He*

Novel FCS-MPTC Based on Priority-Ranking Technique Without Using Weighting Factors for PMSMs *Jinqiu Gao, Rongxin Wei, Saibo Wang, Siyu Wang, Jinxiao Wang*

Design and Comparison of Modular Phase-Unit Yokeless and Segmented Armature Machines *Zhijun Ou, Wenyuan Mi, Yuanfeng Qu, Xueyan Wang, Liyang Liu, Hang ZHAO*

Hidalgo

S12-I-SSGT-6 - Advanced Technologies for Battery Management Systems and Distributed Generation

Chairs: Mahajan Sagar Bhaskar, Gao Yuan

Response Analysis of DC-Link Virtual Synchronized Control for Solar Grid Forming Converters *Ahmed Elsanabary, Mohamed Abido*

An Active Power Filter with Selective Harmonic Compensation and Reduced Switching Losses *Marian Liberos, Raúl González-Medina, Ivan Patrao, Enric Torán, Gabriel Garcerá, Emilio Figueres*

A Level-Based Hybrid DE-NM Strategy for Rapid Generation of SHC-PWM Solutions for Active Power Filters *Igor Araus Wastavino, Felix Rojas, Jonathan Lillo, Javier Pereda Torres, Christoph Hackl*

Residual-Enhanced Proximal Policy Optimization for Optimal Energy Management in Hybrid Energy Storage Systems *Bin Chen, Haoyang Yan, Rui Zhang, Miaobeng Wang, Wei Liu, Yucheng Zhang, Longyun Zhu, Kai Gao*

Advances in Pre-trained Large Models for Battery Management Systems in Electric Vehicles *Muaaz Bin Kaleem, Heng Li, Chenyuan Liu, Yue Wu*

Physics-informed SOH estimation of lithium-ion battery with spatio-temporal attention *Jun Peng, Tanghui Duan, Lisen Yan, Heng Li, yingze yang, Zhijun Liu*

Empirical Analysis of Energy Drift in Battery Energy Storage Systems on Supporting Grid Frequency Stability *SHENGYU TAO, Yezhen Wang,*

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Zepeng Li, Hanyang Lin, Scott Moura, Hongbin Sun, Qiuwei Wu, Xuan Zhang

Sodium-Ion Batteries for Energy Storage Systems: Verification of Properties and Construction of a Small-Scale Battery Storage

Unit Miroslav Tyrpekl, Martin Zavrel, Bedrich Bednar, Zdenek Frank, Vladimir Kindl

Modeling and Control of Second-Life Batteries for Fast Charging

Stations Qian Xun, Yueyan Zhang, li wang

Charge and Health State Estimation of Lithium-Ion Battery in More

Electric Aircraft Considering Electro-Thermal-Coupled Factors *Songyan Liu, Weilin Li, Da Li*

Equalization Optimization Strategy and Simulation Verification for

Reconfigurable Battery Module *Huiying Ling, Ruoyu Wang, Xuliang*

Zhang, Yuhao Wu, Shuhang Wang, Yang Zhou, Xiangrui Meng, Jinlei Sun

Thick electrode battery modeling automated system for cardiac

pacemaker applications *Victor Hueros, Cristina Fernandez, Belen Levenveld, Alejandro Varez, ANDRES BARRADO*

Castilla

S04-I-SSGT-5 - Advanced Multilevel Converters for Green Energy Integration: Topology, Modulation, Control Strategies, and Applications

Chairs: Mohamed Trabelsi, Hani Vahedi

Robust controller comparison for grid forming wind turbines *Gala*

Navarro-Martínez, Jaime Martínez-Turégano, Antonio Sala, Ramon Blasco-Gimenez

Analysis of Power Oscillation Sharing in Grid-Connected Converters

under Unbalanced Grids *Alexander Gomez-Raya, Alain Sanchez-Ruiz,*

Amaia Lopez-de-Heredia, IRMA VILLAR, Endika Bilbao

Topology and Control of a Single-arm Multiplexing Multilevel

Converter with Wide Operation Range *zimeng su, Yi Wang, YuHua Gao,*

w r, Yu yixuan, xiaoyin wu

Cascaded H-Bridge Based on Interleaved Full-Bridge Submodules *Lara*

Bruno, Riccardo Mandrioli, Mattia Ricco, Vito Giuseppe Monopoli

Circulating Current Suppression in MMC Using Submodule Capacitor

Voltage Ripples *Vivek P V, Anshuman Shukla*

Robust Hybrid Modulation Strategy Incorporating Unipolar Phase-Shifted Control for Multi-Cell Asymmetric Cascaded H-Bridge

Converters *Zhixiong Liu, Wanlin Guan, Baoni Sun, Ziheng Ma, Haoyu Li*

Common Mode Voltage Effects and Bearing Current Mitigation in

Three-Level NPC Inverter-Driven PMSMs for Electric Vehicles *DAVIDE*

BARATER, Fabio Bernardi, Germán Fañanás-Puigjaner, Sergio Busquets

An Effective dq-based Control Technique for a Grid-Connected Single-

Phase PUC5 Inverter *Mustafa Alhariri, Mohamed Trabelsi, Hani Vahedi*

A Novel Hybrid Battery Based on a Bidirectional Four-Level Neutral-

Point-Clamped DC-DC Power Converter Interfacing *Gabriel Garcia-*

Rojas, Sergio Busquets-Monge, Alber Filba-Martinez, DAVIDE BARATER

A Model-Free Multi-Objective Deep Reinforcement Learning based

Controller for Modular Multilevel Converters *AbdulRahman Serhan,*

Alamera Nouran Alquennah, Mohamed Trabelsi, Ali Ghayeb, Mohamed Zribi

Lightweight Machine Learning-based Auto-Tuning of FCS-MPC for

CSC Multilevel Inverters *Sara Hamed, Alamera Nouran Alquennah,*

Mohamed Trabelsi, Sertac Bayhan, Haitham Abu-Rub, Ali Ghayeb

A Virtual Space Vector Modulation Scheme for a Reduced-Component

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Four-Level Flying Capacitor Converter *Javad Ebrahimi, Shadi Zargari, Suzan Eren*
Model Predictive Control of a Three-Phase Seven-Level Nested Switched-Capacitor Converter with Flying Capacitor Voltage Balancing *MATIN KESHAVARZI, Javad Ebrahimi, Alireza Bakhshai*

Escudo

S21-I-SSGT-9 - Innovations in Power Conversion and Energy Management for Electrification and Renewables Integration

Chairs: Yanmin Wang, Wenwen Xiong

A novel approach for flexibility market management using coordination of electric vehicles and battery systems *Mohammad Hassan Nikkhah, Mousa Alizadeh, Ali MORADIAMANI, Mahdi Jalili, Xinghuo Yu*

KUformer: KAN-UKF-Based Transformer for Battery SoH

Prediction *Jinhao Zhang, Xilin Dai, Ruidi Zhou, Weifeng Zhang, Hao Ma*
Sensitivity-Based V2G Deployment Strategies for Voltage Support in Distribution Networks *Xusheng Wang, Dongze Li, Abhisek Ukil, Akshya Swain*

Stackelberg Game-Based Dynamic Pricing and Optimization for Electric Vehicles and Photovoltaic-Energy Storage-Charging

Station *Yiwen Lu, Hongpeng Liu, Shengzhuo Hu, Fanli Meng*
Analysis of a real-time co-simulation framework for smart and secure EV charging infrastructures *Erika De Bardi, giambattista gruosso*

Comparison of Low-Frequency Transformer-Based and Solid-State Transformer-Based Systems for High-Power Electrolyzer Power Supply *Samuel Queiroz, Levy Costa, João Victor Guimarães França*

An LLC Resonant Converter With Reconfigurable Secondary-Bridge With Wide Output Voltage Range *Samuel Queiroz, Levy Costa, Linxi Li*

A Reconfigurable LLC Resonant Converter Based on an Adjustable Turns Ratio Transformer *Samuel Queiroz, Levy Costa, Linxi Li*

Reconfigurable Rectifier-Based Resonant Converter for Wide Output Voltage Applications *Milan van de Zanden, Levy Costa, João Victor Guimarães França*

Modular Multi-Output Electric Vehicle Charger with Ripple-Free Wide Output Voltage Range and No Carrier Synchronization *Diego Anchieri, Vitor Monteiro, Mattia Ricco, Riccardo Mandrioli*

Optimized Design and Experimental Validation of a 4.1 MVA/1 kHz Medium-Frequency Transformer for High-Power DC

Transformers *Jialiang Hu, Weihong Yang, Yiqing Ma, Bin Cui, Zhe Yang, Xin Jin, Xueting Tang, Mingli Fu, Biao Zhao*

Advancing Discontinuous-Model Predictive Control for High Performance Inverters via Optimized Zero-Voltage State Selection based on Offset Voltage *chan roh, Hyeongyo Chae*

Reactive Power Compensation Model in A Three-Level NPC Topology Using Sequential Predictive Current Control with Space Vector Pulse

Width Modulation *Juan Arnaldo Insfran Ferreira, Matias Abel Aguilar Chaves, Alfredo Renault, Leonardo Comparatore, Julio Pacher, Osvaldo Gonzalez, Marco Rivera, Patrick Wheeler*

LQR-Based Current Controller for Three-Phase Inverters with Asymmetric Loads *Alberto Leamus, Javier Uceda, Airán Frances, Dionisio Ramírez*