

XV CEI ANNUAL MEETING

JUNE 1st - 2nd, 2023



Enabling Electronic Technologies for the New Challenges in Space

Topics

- Advanced Power Electronic Converters and Systems
- Embedded Intelligence, IoT and Reconfigurable Systems
- Emerging Applications
- Modeling, Characterization and Simulation of Components and Power Converters



POSTER SESSIONS (ordered alphabetically by author)

- Custom wearable for affective computing . R. Adreu
- Complete design of IPT coil structures for dynamic wireless charging of electric vehicles . M. Alegre
- Single-Phase Single Stage PFC Based on a Novel Floating Capacitor Filter for Electric Vehicle Charger Application . I. Alzuguren
- Analysis of MRI test in brain-implanted electronic devices . J. Amores
- Analysis and Design of a Radio Frequency Generator for Gridded Ion Technology Thruster . M. Astudillo
- Optimal power granularity in transformers for electrical charging applications . M. Astudillo
- GPU-based Deep Neuroevolution for Reinforcement Learning Problems . J. Barberá Civera
- Design and Implementation of an Electronic Interface for Signal Recording from Neuronal Cultures . T. Camacho
- Design and optimization of a Full-bridge converter for space and high-frequency application based on GaN . S. Canton
- 3D Thermal Modeling of Inductive Power Transfer Coils Based on Basic Thermal Network for Optimization Analysis . L. Clavero
- Temperature Prediction of the Magnetic Core Considering the Non-Uniform Flux Distribution . L. Clavero
- Design of modular Dual Active Bridge for unmanned WIG vehicle transportation . A. Durán & P. Hidalgo
- Online ML-Based Modeling of Reconfigurable Multi-Accelerator Systems for Dynamic Workload Management . J. Encinas
- Design and optimization of PCB-based magnetic components for space and high-frequency applications . B. Fernandez
- High capacitor charging DC-DC converter based on GaN technology . A. García
- Optimization strategies for energy-aware computation offloading in the Extreme Edge of Internet of Things . P. González
- Regulator Design For Three-Phase Inverters with Unbalanced Impedances . M. Heredia
- Internet of Things Technology for Train Positioning and Integrity in the Railway Industry Domain . R. Hernández
- Open-Source GUI for Fast Prototyping of Magnetic Components Based on Planar Conductors for Space Applications . M. Íñiguez
- Affective Computing for fear recognition using physiological signals: A deep learning approach . S. Junjiao
- Optimal Power Flow Management in an Electric Vehicle Charging Station . J. López
- Isolated topologies based on capacitor converters . G. Maldonado
- Design of advance sensor platform for implantable battery characterization . S. Martín
- Design of compact miniaturized implantable antenna for medical brain diseases . J. Martínez
- Developing a microfluidic device for culturing Biological Neural Networks . J. Martínez de la Mata
- Increasing Power Transfer Capability of Wireless Battery Charger Under Misalignment Conditions . N. Mirkovic
- FPGA Based Model Predictive Control with Switching Losses Reduction and Hardware-in-the-Loop of A Direct Resonant Matrix Converter . X. Mo
- Artificial Neural Network Based Thermal Model for a Three-Phase Medium Frequency Transformer . D. Molinero & D. Santamargarita
- Isolated DC/DC Converter for RF Generator of a Power Propulsion Unit: Topology Comparison based on GaN Semiconductors . G. Núñez
- Blackbox model for DC/DC converters with strong nonlinear dynamics based on accurately switching among local models . F. Pérez
- Design of Intensity and voltage sensors for dual active bridge control . C. Ramos
- Internet of Things for Secondary Control of DC Microgrids: a Step Towards a Fully Distributed Power System . A. Redondo
- Magnetics Optimization for operating in a Wide Frequency Range in a Three-Phase LLC converter . D. Ríos
- Miniaturization of a wireless power transfer device for medical brain applications . A. Rodríguez
- Post-Quantum Security in LoRa Communication . R. Rojo
- Narrow Frequency Span - Ultra Wide Input Voltage Range LLC Converter . A. Sánchez
- On-line Monitoring of a Medium Frequency Transformer Using Artificial Neural Networks and FEM Simulations . D. Santamargarita & D. Molinero
- Blockchain for IoT-based Health Applications . J. Señor
- Impact of Post-Quantum Security in the Communications of IoT Edge Deployments . J. Señor
- Study of algorithms for smart design of magnetic components . J. Serrano
- Enhancing RISC-V Systems on Chip with Coarse-Grained Reconfigurable Architectures . D. Vázquez
- Group Authenticated Key Exchange (GAKE) for IoT . A. Vidal
- SIMBA - Small IPT for IMplantable Biomedical Applications . L. Zamora
- Design and Optimization of Integrated PCB Output Filters for Very for Very High-Frequency Applications . L. Zhou



SHORT COURSES

Attendees are invited to attend the following short course:

- *Post-quantum security in IoT devices (10:30 to 13:30 h.)*
Coordinators: J. Portilla (UPM) y J. Señor (UPM)
- *Thermal Modelling of Magnetic Components using ANNs (Preliminar) (11:30 to 13:30 h.)*
Coordinators: A. Delgado (UPM) y D. Santamargarita (Universidad de Alcalá)

CEI

Registration at CEI Annual Meeting

15:30-16:00

OPENING SESSION

16:00-16:30

PLENARY SESSION

16:30-18:30

Enabling Electronic Technologies for the New Challenges in Space

TBD (*European Space Agency - ESA*)Ignacio Barbero (*AIRBUS CRISA*)TBD (*Thales Alenia Space España- TASE*)David González (*GMV*)

CEI LAB TOUR AND POSTER SESSION

18:30-20:00

You will have the opportunity to meet our young researchers, exchange interesting ideas and enjoy beverages and food that will be available during the poster session. Do not miss this great opportunity to know us better.

The poster session will be held in the main lab of Centro de Electrónica Industrial (CEI). Find the provisional list of the posters in the last page.

TECHNICAL SESSIONS

9:00-14:00

TECHNICAL SESSION A

9:00-10:40

"Internet of Things Technology for Train Positioning and Integrity in the Railway Industry Domain". Rogelio Lorite

"Power electronic for the electric space propulsion: the path to shrink the volume and weight". Guillermo Nuñez y Miguel Astudillo

"Blackbox model for DC/DC converters with strong nonlinear dynamics based on accurately switching among local models". Fernando Pérez

"Extreme Fast Charging station for Electric Vehicles". Aleksandra Stanojević (Innsbruck Univ)

"Online ML-Based Modeling of Reconfigurable Multi-Accelerator Systems for Dynamic Workload Management". Juan Encinas

Coffee Break

10:40-11:10

TECHNICAL SESSION B

11:10-12:50

"Novel Three-Phase to Single-Phase Matrix Converter Modulation Strategy for Bidirectional Inductive Power Transfer". Nikola Mirkovic

"Electrical Model of a Membraneless Micro Redox Flow Battery-Fluid Dynamics Influence". Alberto Bernaldo de Quirós

"Key Aspects of a Compact High-Gain High-Frequency DC/DC Converter: Three-Phase LLC Converter". Daniel Rios

"Enhancing RISC-V Systems on Chip with Coarse-Grained Reconfigurable Architectures". Daniel Vázquez

"3D Thermal Modeling of Inductive Power Transfer Coils Based on Basic Thermal Network for Optimization Analysis". Lucia Clavero

Short Break

12:50-13:00

TECHNICAL SESSION CEI GRANTS PROGRAM

13:00-14:00

"CEI Grants Program Presentation". Eduardo de la Torre

"Advanced Isolated GaN Power Converter". Catalin Ovidiu y Gabriel Maldonado

"Developing a microfluidic device for culturing Biological Neural Networks". Andrés Otero

"Design of an implantable device for brain tumor treatment". Regina Ramos and Miguel Jiménez

"Internet of Things for Secondary Control of DC Microgrids: a Step Towards a Fully Distributed Power System". Alejandro Redondo

At 14:15 h. photo group at the ETSII Main entrance

COCKTAIL will be served in the Sala de los Retratos at 14:30 h.