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CPE-POWERENG 2027 Special Session

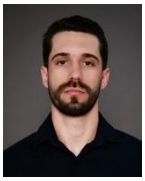
Advances in Power Converter Topologies and Control Strategies for Sustainable and Resilient DC Electrification

- **Abstract:**

Growing demand for efficient and reliable power supplies in buildings, data centers, and electric vehicles is driving research into DC electrification. DC systems can reduce conversion losses, integrate renewable energy and storage, and improve power delivery. This special session explores advances in converter topologies, control, protection, and system integration for sustainable and resilient DC infrastructure. Topics include DC microgrids, AC grid integration, renewable energy, storage, IT loads, electric vehicle charging, and coordinated energy management. Researchers are invited to share approaches and experimental results addressing efficiency, reliability, scalability, and interoperability to support the wide adoption of DC systems.

- **Topics:**
  - DC microgrids and AC grid integration for buildings, facilities, and energy resources.
  - Renewable energy generation and energy storage technologies.
  - Emerging power-electronic-based technologies and design for data centers and IT loads.
  - Electric vehicle charging and traction systems, including V2G, V2H, and V2L technologies.
  - Advanced power converter topologies and control strategies for sustainable DC electrification (e.g., partial power converters, reconfigurable converters, universal converters, *etc.*).
  - Smart integration of DC systems for optimized performance, reliability, resilience, and efficiency of buildings, facilities, public utilities, and energy communities.

- **Organizer(s):**



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