



**CALL FOR PAPERS
SPECIAL SESSION ON**

Advanced Control Methods of Power Conversion Systems for Grid-integration and Transportation Systems

for ICCAD 2026

July 7-9, 2026, Lisbon, Portugal

Session Co-Chairs:

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Session description:

The steadily increasing integration of renewable energy systems into the utility grid poses new challenges for future power grids. The intermittent nature of power injection from renewable sources into the grid, coupled with unpredictable demand on the load side, along with the high penetration of electric vehicles (EVs), can lead to severe issues regarding the stability and performance of the utility grid.

Power electronics-based power conversion systems play a crucial role in maintaining grid stability and ensuring smooth operation through the control of power flow between the generation and demand, including the power generated from renewable energy sources via maximum power point tracking (MPPT) and flexible power point tracking (FPPT), in Grid Forming or Grid Following mode. This also concern the control of the active and reactive powers injected into the utility grid, the management of power flow between the utility grid and EVs through the vehicle-to-grid (V2G) and grid-to-vehicle (G2V) technologies, and the control of the EV motor drives.

To enable power conversion systems fulfilling their emerging responsibilities, including the support of the utility grid during low voltage faults through low voltage ride-through (LVRT) capability, and integrating V2G and G2V technologies for peak shaving and valley filling, it is necessary to develop more efficient and high-performance controllers for power conversion systems. These controllers must ensure a robust and high-quality power flow control. The controller must provide high tracking performance of the reference current and should be capable of rejecting internal/external disturbances, handling model parametric mismatches, and dealing with grid voltage distortion.

In this session, we aim to gather contributions on advanced control techniques for power conversion systems in grid integration of renewable energy systems and transportation electrification applications. This special session provides a one-stop venue for presentation and discussion on emerging research in this field.

Topics of interest include, but are not limited to:

- Advanced nonlinear, predictive, model-free, and data-driven control methods for power converters in renewable energy systems and electric vehicle motor drive applications;
- Grid-feeding control methods for grid integration of renewable energy systems, including solar photovoltaic, wind, and hydrogen energy;
- Grid-forming control methods for renewable energy systems in remote microgrid applications;
- Control of fast-chargers for EV charging applications;
- Maximum and flexible power point tracking for constant power generation in photovoltaic systems;
- Power converters control for V2G and G2V applications.

SUBMISSION

Papers must be submitted electronically for peer review by: **January 31, 2026**

<https://www.iccad-conf.com/submission/>

All papers must be written in English and should describe original work. The length of the paper is limited to a maximum of 6 pages (in the standard IEEE conference double column format).