Journal of Control Science and Engineering

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Special Issue on

Power Electronics Control in Smart Grids

CALL FOR PAPERS

Smart grids provide enhanced functionality for the electrical grid infrastructure and are usually characterized as intelligent, flexible, and optimized, with self-healing capabilities. Most of these properties can be enhanced by using suitable controlled Power Electronic Converters (PEC).

Therefore, control development in PEC is fundamental in the context of smart grids, to guarantee fast dynamic responses that cannot be achieved with the traditional centralized electromechanical solutions. So far, PECs have enabled the connection of Distributed Energy Resources (DER) as Distributed Generation, Electrical Vehicles (V), Distributed Storage Devices, controllable loads, and prosumers to the grid. Moreover, due to the massive growth of Distributed Generation, highly motivated by environmental concerns, PECs are also emerging as a key asset to allow a higher controllability of the grid, guaranteeing dynamic voltage support, demand side management, and improved reliability and power quality.

With the high penetration of intermittent (uncertain, nondispatchable) distributed power generation, bidirectional power flow has become a reality at the distribution voltage level, especially in nonload scenarios, and issues as sustained overvoltages and frequency fluctuations have arisen.

In this scope, new control solutions are required. We invite postgraduate students, engineers, academics, and researchers to contribute original as well as review material, addressing recent advances on PEC applications in smart grids.

Potential topics include but are not limited to the following:

- Modelling, control, and operation of DC and AC microgrids
- Distributed energy resources with dynamic voltage control
- Advanced control techniques for Power Electronic Converters in smart grids
- Distributed voltage and frequency regulators for smart grids
- Distributed power flow controllers
- Control and operation of smart EV chargers (G2V, V2G operation)
- Solid State Transformers (SST)
- Hybrid and solid state circuit breakers: AC and DC

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