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Special Session on

Modelling, optimisation, and control of smart/micro grids with renewable energy resources

Organized and co-chaired by:

Dr Xiandong Ma, Lancaster University, Lancaster, UK — xiandong.ma@lancaster.ac.uk
Prof Mohamed Benbouzid, University of Brest, Brest, France — Mohamed.Benbouzid@univ-brest.fr
Dr Lin Jiang, University of Liverpool, Liverpool, UK — ljiang@liverpool.ac.uk

Call for Papers

Technical Outline of the Session and Topics:

The power grid is undergoing fundamental changes from a classical hierarchical generation-transmission-distribution approach to a geo-distributed smart power grid system that interconnects multiple microgrids to interact with each other to balance supply and demand. The microgrid, as a fundamental cell in the system, are connected or disconnected as integrated with the intermittent nature of renewable power supply and variable load demands. Power grid systems also experience a wide range of different operating conditions because power generation profiles from renewable energy sources (RES) and user consumption patterns dynamically change across location and time. The increasing complexity and wide deployment of RES make them difficult and costly to optimize and maintain, which may cause significant energy waste and crisis.

To make the smart power grid work, the critical challenges are system scalability, control stability, and resilience to accommodate failures and/or attacks across the system. These requirements result in a dynamic optimization and control problem along with constraints of stringent deadlines. This necessitates the need for a paradigm shift to develop highly responsive, robust and autonomous resource management, aided by the use of advanced machine and deep learning.

In this context, the objective of this special session is to address and disseminate the state-of-the-art research and ongoing development results on the implementation of modelling, optimization, and control of smart/micro grids with renewable energy resources for a reliable and sustainable operation.

Topics of the Session include, but are not limited to:

- Multi-energy systems and distribution system
- Microgrid and DC/AC hybrid grid
- Power system modelling, simulation and optimization
- Power flow optimization and control
- Condition monitoring and control, including control for optimised exploitation
- Energy management and demand-side response and management
- Power electronics enabled power system
- Renewable power generation and integration
- Advanced control techniques such as distributed control and observer-based control
- Attack-resilient detection and control of the power grid
- Artificial intelligence and digital twin-enabled solutions and applications

Author's schedule:

Deadline for submission of special session papers	April 15, 2024
Notification of acceptance	June 10, 2024
Deadline for submission of final manuscript	July 01, 2024

Early submission is highly encouraged for early decision notifications!

All the instructions for paper submission are included in the conference website:
www.iecon-2024.org