Special Issue

Stability, Operation, and Control in Power Systems

Message from the Guest Editors

The integration of renewable energy and smart grid technologies presents challenges in power system stability, efficiency, and control. The traditional paradigm, designed for centralized generation, is transforming with advanced metering infrastructure. Along with the development of cyber-physical systems (CPSs), introduces new challenges. Artificial intelligence (AI), particularly machine learning and reinforcement learning, is emerging as a key solution to optimize power flow, predict renewable fluctuations, and detect anomalies. This Special Issue invites contributions in the following areas:

- Stability enhancement in high-penetration renewable scenarios;
- Cloud–edge–end collaboration for reliable power systems;
- Sensing–Communication–Computing–Control Integration;
- AI-driven optimization for grid operation and load balancing;
- Resilience strategies against extreme events;
- Decentralized control of microgrids and distributed energy resources;
- Machine learning and AI applications in power system operations;
- Robust control methods for uncertainties in renewable generation;
- Market mechanisms and their impact on power system operation;
- Power system planning considering stability and control.

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Editor-in-Chief

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