Call for Papers

Special Issue on "Hybrid-augmented Intelligence in Power Systems Operation and Control"

Important Dates

Full Paper Submission: January 31, 2023

Final Decision Notification: May 31, 2023

Publication of Special Issue: July 31, 2023

Power systems operation and control is concerned essentially with the cognition, management, and control (CMC) process for complex power systems. A power system with high a penetration rate of renewable energies, i.e., the "Next-Generation Power Systems", has featured characteristics of open operational environments, complex system components, diverse operational modes, tightly coupled component behaviours, stringent demand on real-time response performance, high criticality.

There is an obvious and huge barrier existing between the current needs of complex power systems operation and control and the capability limitation of the current AI technology. As a result, hybrid-augmented intelligence has recently emerged as a new form of AI, i.e., human intelligence and machine intelligence are mixed aiming to enhance each other. They are coordinated, integrated and utilized throughout the process of system cognition, management, and control. The hybrid-augmented intelligence technology needs to address a serial of key scientific, technical, and engineering problems in the complex systems operational and control process, including how to systematically model power grid operational processes; construct environment models shared by human and machine agents; model tasks and behaviours of human-machine intelligence; effectively complete complex CMC tasks on the basis of the above models; and establish human-machine autonomous cooperative CMC mechanisms.

This special issue aims to bring together scholars and practitioners from both academia and industry to discuss the most recent advances on hybrid-augmented intelligence in power systems operation and control. The topics of the special issue include, but are not limited to:

- New research and development methodology, technical architecture, process protocols of hybrid-augmented intelligence in power systems operation and control;
- Hybrid-augmented intelligence based power system operational mode design;
- Hybrid-augmented intelligence based power system dispatch task scheduling and optimization;
- Hybrid-augmented intelligence based knowledge engineering in power system operation and control;
- Hybrid-augmented intelligence based joint human-machine learning for power operational tasks;
- Hybrid-augmented intelligence evaluation and self-evolution in power operation and control tasks;
- Security, privacy, and trustworthy computing in hybrid-augmented intelligence based power systems operation and control;
- Applications of hybrid-augmented intelligence based power systems operation and control.

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