

IEEE Internet of Things Journal Special Issue on the IoT for Power Grids

Recent years have witnessed the exciting developments for the power grid. For instance, many traditional mechanical components are being replaced by modern electronics devices that can operate intelligently; new elements such as renewable energy resources and various large-scale energy storage are introduced into the grid to bring new outlook on the system operation and control; smart appliances are produced to facilitate more customized and efficient energy usage; advanced sensors such as the Phasor Measurement Units (PMU) and the Advanced Metering Infrastructure (AMI) are designed and implemented for real-time wide-area monitoring of the system conditions. In general, the power grid is increasingly organized and managed as an interconnected network of many different individual components that operate intelligently in a distributed but connected manner, as opposed to the traditional centralized fashion. In other words, the power grid is evolving into a big Internet of Things (IoT).

On the one hand, this new IoT aspect of the grid engenders many potential benefits to the power systems such as improved situational awareness in monitoring, enhanced intelligence and automation in operation and control, boosted efficiency in energy dispatch and management, as well as cheaper and cleaner energy usage, just to name a few. On the other hand, the IoT perspective of the grid also introduces many challenges such as inter-operability of the devices, the Quality of Service (QoS) for the communications among heterogenous components, the cyber and physical security of the infrastructure, the reliability and resiliency of the entire system, and massive data processing etc. In this special issue, we call for the efforts both to explore the benefits and address the challenges in the IoT for power grids.

This special issue is open to accept paper submissions on the efforts to both explore the benefits brought by the IoT for power grid and address the various challenges resulted from the IoT construction of the power grid. The topics include, but are not limited to:

- 1) the development of devices or equipment curtailed for power grid IoT such as more advanced sensors, switches, digital relays etc.;
- 2) the communication techniques and networking infrastructure to support the implementation of power grid IoT;
- 3) the development and implementation of specific power system application platforms that capitalize on IoT techniques such as IoT-based power system wide-area control and protection, IoT-assisted energy management system, data-driven stability analysis and so on;
- 4) signal processing and big data analysis for power grid IoT; and
- 5) the cyber and physical security issues in the power grid IoT such as data integrity, data privacy, data quality power system reliability and resiliency, and so on.

Important Dates:

Submission Dates: December 15, 2021

First Reviews Due: February 1, 2022

Revision Due: March 15, 2022

Second Reviews/Notification: April 15, 2022

Final Manuscript Due: April 30, 2022

Publication: 2022

Submission Guidelines:

All original manuscripts or revisions to the IEEE IoT Journal must be submitted electronically through IEEE Manuscript Central, <http://mc.manuscriptcentral.com/iot>. Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at <http://ieee-iotj.org/guidelines-for-authors/>.

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