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IET Cyber-Physical Systems: Theory & Applications

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Call for Papers
IET *Cyber-Physical Systems: Theory & Applications*

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Special Issue:

Cyber-Physical Systems in Smart Grids:
Security and Operation

A smart grid is considered as a typical cyber-physical system (CPS) with a combination of a physical power system and a cyber system, including those for sensing, monitoring, communication, computation and control. The interdependence and interplay of the cyber part and the physical part could likely introduce new risks to the energy system operation. A cyber disturbance, either a malicious data attack or an accidental component failure, may lead to serious consequences for the smart grid security and performance. Therefore, it is a new challenge to investigate methodologies of modeling, analyzing, evaluating and optimizing heterogeneous systems which integrate cyber and energy infrastructure as a whole. Furthermore, with the development of distributed generation, electric vehicles, demand response mechanisms and electricity markets, smart grids are increasingly showing the characteristics of "human-in-the-loop", which negatively impacts cyber-physical systems through complicated social activities and human behaviors. CPS and related cutting edge techniques could be adopted to cope with the increasing uncertainties by discovering the social behavior patterns and providing response flexibilities.

The seamless integration of CPS requires proper design and utilization of sensing, actuation and communication frameworks, based on which further applications with modeling, scheduling, optimization, and control could be implemented to make energy systems smarter. Challenges still remain for this emerging cyber-physical-social system (CPSS). A better understanding is required of the emerging problems in smart grids from the CPS perspective. In this Special Issue, we invite original and unpublished submissions discussing new theories, technologies, methods, and field tests for the smart grid CPS.

Topics of interest include but are not limited to:

- Heterogeneous system modeling for smart grid CPS
- Methodologies for modeling and assessment of smart grid cyber-physical security and privacy
- Intrusion detection and system integrity
- Data attack and defensive techniques of smart grid CPS
- Multi-domain co-simulation of smart grid CPS
- Modeling, analysis and optimization of human-in-the-loop CPSS
- Advanced sensing and computing techniques with an application to smart grids

- Big data analytics and applications for smart grid CPS
- Secure and trustworthy demand-response management
- CPS based distributed optimization and control for smart grids
- Economics and incentives for smart grid security and privacy
- Smart grid field applications based on CPS technology
- Cost/benefit tradeoffs in smart grid CPS performance

All submissions are subject to the journal's peer-review procedures. The authors should follow the journal's Author Guide at **http://digital-library.theiet.org/journals/author-guide** when preparing papers for submission to the Special Issue.

Important dates:

Submission deadline:
Feb 28 2017

Publication Date:
Q4 2017

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