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The electrical grid is a huge and complex system which represents a key critical infrastructure. Due to this fact, the electric power industry has traditionally adopted a conservative attitude regarding changes and the electrical grid has experienced very few breakthroughs for decades, remaining almost unchanged from an architectural perspective. As a result of that, some problems and inefficiencies have been carried around for a long while and traditional electrical grid is not prepared to meet the new requirements and features that nowadays society demands from it. Hence, for some time now, the electrical grid is undergoing slowly but surely its inexorable metamorphosis under the new paradigm of the so-called smart grid.

Thus the smart grid represents the next generation electrical grid and manages all large-scale and distributed energy resources by incorporating distributed sensor and actuator networks and cutting-edge processing and decision-making tools into the grid. Hence, from generation to consumption on industrial or residential applications, including renewable and nonrenewable generation and microgeneration, energy storage, and demand flexibility, all the available resources are on the way to be managed by means of such information and communications technologies infrastructure.

The purpose of this special issue is to publish high-quality cutting-edge research papers as well as review articles addressing the use of distributed sensor and actuator networks in smart grids, including topics related to both such communications infrastructures responsible for gathering consumption and generation data and delivering the appropriate commands, as well as to the logic, algorithms, and IT solutions responsible for processing and making decisions based on the collected data at due time.

Potential topics include, but are not limited to:

- ▶ Communications architectures, protocols, and standards for the smart grid interoperability and conformance testing
- ▶ Wireless (short and long range) and wired (narrowband and broadband PLC over low and medium voltage networks) technologies
- ▶ Wide-area monitoring and control networks, advanced metering infrastructure, distribution automation, and phasor measurement units
- ▶ Sensor and actuator infrastructures for the integration of distributed renewable generation and microgrids, multiagent systems
- ▶ Sensor and actuator infrastructures for the integration of electric vehicles, vehicle to grid networks, electromobility, and roaming
- ▶ Sensor and actuator networks for home and building energy management systems, fusion of sensor data, context data, and online social networks
- ▶ Online and offline massive data processing techniques (semantic techniques, machine learning techniques, NoSQL, big data, and cloud computing)
- ▶ Smart grid cyber security, threats, attacks, forensics, standard frameworks and best practices, and privacy
- ▶ Test-beds and field-trials

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/ijdsn/sgrid/>.

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