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Special Session on

"Smart Sensors/Actuators and Standards for SG/IoT/IIoT/CPS"

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Call for Papers

Sensors/actuators are used everywhere, such as in aerospace, automobile, environmental monitoring, asset tracking in supply chain, smart buildings/homes, healthcare, industrial automation, smart manufacturing (SM), smart grid (SG), Internet of things (IoT), industrial Internet of things (IIoT), cyber-physical systems (CPS), and smart cities. A smart sensor (SS) consists of a set of sensors, metadata, signal and data processing module, and network communication module. SS has some basic capabilities: sensing, signal conditioning, analog-to-digital conversion (ADC), digital-to-analog conversion (DAC), sensor data processing, timing and synchronization by an internal clock with optional external time reference, and network communications with the outside world through a network communication module. Thus SSs can have intelligent capabilities, such as self-description, self-identification, self-diagnostics, self-calibration, self-testing, self-validation, location-awareness, multi-sensing, and data fusion. Hence, SSs can play key roles in SG/IoT/IIoT/CPS and smart city applications. SSs can provide real-time data and status of SG/IoT/IIoT/CPS and smart city systems for real-time monitoring and control operations, as a result improving overall system efficiency and reliability. However, sensor data exchange and interoperability are major challenges for all these applications. Standardizing smart sensor interfaces, for example, IEEE 1451 suite of standards, will help to achieve sensor data interoperability. Interoperability testing and measurement and assessment (M&A) methods of smart sensors are keys to the success of achieving and assuring interoperability of smart sensors/actuators deployed in SG/IoT/IIoT/CPS and smart city systems.

Topics of the Session:

This special session aims to provide a forum for discussion that will attract scholars and industry practitioners for sharing and discussing the latest advances in this scientific field. Topics in this session include, but are not limited to:

- Smart sensors/actuators

- Smart sensor digital twins
- Smart sensor/actuator interface standards and reference implementations
- Smart sensor/actuator interoperability and conformance testing methods and certifications
- Smart sensors for SG applications
- Smart sensors/actuators for IIoT/IoT applications
- Smart sensors/actuators for cyber-physical systems
- Wireless sensor networks for industrial applications
- Cybersecurity for smart sensors/actuators
- Timing and synchronization for smart sensors/actuators
- Low power wireless sensors and energy harvesting
- Embedded systems and hardware/software design and implementation
- Process monitoring and parallel and distributed systems
- New sensor/actuator technologies for Industry 4.0