International Journal of Distributed Sensor Networks

Special Issue on

Perception, Reaction, and Cognition in Wireless Sensor Networks

Call for Papers

The past ten years have witnessed great developments of sensor networks in both theory and applications. The long been expected and advocated ubiquitous sensing is becoming increasingly popular and widely admitted with the great success of many applications of wireless sensor networks in environmental monitoring, precision agriculture, human health monitoring, etc. Correspondingly, theoretical foundations of wireless sensor networks, such as sensor positioning, time synchronization, communication protocols, data fusion, operating systems, etc., also have received intensive attentions. However, in current stage, most attentions in theory still regard wireless sensor networks as a means of data collection, instead of autonomous networks with self-decision making ability based on the collected data. The widely investigated type of wireless sensor networks with perception but without reaction is in contrast to the autonomous network with perception, reaction and cognition, which adapts to the monitored environment by exploiting information feedback (e.g., the collected data feedbacks to adjust the electricity price for smart power grid network). Introducing reaction, cognition to a sensor network opens a door to transform it from a passive network for data collection to an adaptive and active network with self-intention, self-evolution and self-intelligence.

This special issue aims to gather articles from different relevant areas to enhance the development of sensor networks in both theory and engineering implementation. Potential topics include, but are not limited to:

- Intelligent sensor theory and applications, Machine learning applications to sensor networks
- Distributed signal processing and data fusion for collaborative information
- Applications of distributed estimation and control, game theory, optimization in WSNs
- Task allocation, reprogramming and reconfiguration
- Analytic, simulation approaches for distributed sensor performance and energy characterization
- Design, implementation and fabrication of hardware for wireless sensor networks
- Reliable wireless sensor network for energy management in a harsh environment
- Transport protocols, congestion control and multicast for wireless sensor networks
- Design of software environment (including modular OS, virtual machine, reconfiguration features, etc.) for active sensor networks
- Outlier detection, attack and defense strategy, information security in networked environments

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Manuscript Due	Friday, 28 September 2012
First Round of Reviews	Friday, 21 December 2012
Publication Date	Friday, 15 February 2013

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