Editorial

Green and Friendly Communication for Sensor Networks

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Recent advances of various sensor technologies, such as Internet of Things, sensor cloud, underwater sensor, healthcare sensor, have moved us toward the era of worldwide sensor networks. People can sense and collect necessary sensory data anytime and anywhere. However, efficient resource utilization in terms of energy consumption, spectrum allocation, routing selection, and so forth, is still a big challenge in the sensor networks research area. Designing "green" sensor networks, the next generation of wireless sensor networks has become a matter of paramount importance. On the other hand, the lack of cooperation among sensors not only affects the quality of communication, but also results in unbalance of resource utilization, which further reduces the robustness of the sensor system. "Friendly" cooperation among sensors, such as information sharing, spectrum/energy awareness, routing adaptation, and data caching, enables providing potential benefits for optimizing and balancing the resource usage, hence improving the life-time of the entire sensor network. Therefore, green and friendly communication becomes the utmost important and promising avenue for the future sensor network research.

The editorial team has received 17 paper submissions and would like to take this opportunity to thank all authors for submitting their works to this Special Issue. After thorough and meticulous reviews, followed by extensive discussions among Guest Editors and the Editor-in-Chief, 9 papers were accepted for publication in this Special Issue.

First, among the accepted papers, there are two articles addressing the integration of data communications coming from wireless sensor Nntworks with the purpose of achieving energy-saving. In "ECMTADR: Energy Conservative Multi-Tier Architecture with Data Reduction for Cluster-Based Wireless Sensor Networks," T. Cevik proposes a sophisticated architecture comprising of data reduction, load balance, and topology control for data communication. N. Ullah et al., in "Modeling MAC Protocol based on Framed Slotted Aloha for Low Energy Critical Infrastructure Sensor Networks", analyze a MAC protocol for low energy critical infrastructure monitoring (LECIM) networks, and propose a framed slotted aloha based MAC for LECIM using linear increasing contention window size to reduce the packet drop probability

Cooperation is one of the most effective methods to improve the performance and robustness of routing algorithms, particularly when working under wireless sensor networks. The paper by Y. Chen et al. entitled "A Novel Energy-Efficient Reception Method Based on Random Network Coding in Cooperative Wireless Sensor Networks" presents an opportunistic reception algorithm for energy-efficient transmission in cooperative WSNs. In "Shared MPR Sets for Moderately Dense Wireless Multi-hop Networks," T. Kitasuka et al. propose a method for achieving more efficient multipoint relay selection in moderately dense wireless multi-hop networks than the conventional multipoint relay selection. In "Intelligent Transmission Power Allocation for Distributed Beamforming in Wireless Sensor Networks," S. Chung et al. propose an Intelligent Transmission

Power Allocation algorithm to guarantee the required channel capacity considering dynamic channel statement, number of cooperating source nodes, and distance between the average source nodes and destination. Y. Sun et al., in "An Adaptive Routing Protocol Based on QoS and Vehicular Density in Urban VANETs", explore an adaptive routing protocol based on QoS and vehicular density in urban VANET environments.

The trade-off between security and energy efficiency for wireless sensors networks is addressed in the paper by D. Rusinek et al. entitled "Security trade-off and energy efficiency analysis in Wireless Sensor Networks." The authors propose an energy analysis module for the quality of protection modeling language by means of which one can analyze the influence of various security levels on the energy consumption of a protocol. Furthermore, an advanced communication module is proposed as an extension of the quality of protection modeling language, which enhances the abilities to analyze complex wireless sensor networks.

High efficient resource dissemination and delivery is also an important issue for the green and friendly communications in wireless sensor networks. The paper by S. Jia et al. entitled "A Novel Interest Detection-based Video Dissemination Algorithm under Flash Crowd in Mobile Ad Hoc Networks" proposes a novel interest detection-based video dissemination algorithm under flash crowd in mobile ad hoc networks. In "Cloud-assisted Scalable Video Delivery Solution over Mobile Ad Hoc Networks," L. Zhong et al. present a novel Cloud-assisted Scalable Video Delivery Solution over mobile ad hoc networks.

All these works are mature and present detailed research proposals, good testing results and interesting result analyses. The editorial team hopes the audience will appreciate them and wish the readers to have pleasant reading.

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