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Editorial

Innovative Applications and Security of Internet of Things

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With the advances and falling cost of intelligent things like RFID/USN, sensor networks, NFC, ZigBee, smart phones, and other relevant technologies, the potential applications and implementations of Internet of things have been intensively studied by both the academia and the industry. One potential application is integrating social networks with IoT, which results in the social Internet of things (SIoT). This vision not only provides potential opportunities but also new challenges. Innovative application and security are two main issues toward this paradigm.

This special issue includes five articles covering security issues, power management issue, innovative applications, and integration with social informatics.

The study “*Framework for NFC-based intelligent agents: a context-awareness enabler for social Internet of things*” proposes a framework for developing an NFC-enabled intelligent agent, which combines the NFC technique with context-acquisition, ontology-knowledgebase, and semantic-adaptation modules, a credit-based incentive scheme to encourage social cooperation and to recommend relevant services. The resultant social-advertising system shows that this framework can support a wide range of different functionalities and is indispensable to an NFC-based intelligent agent for social Internet of things.

The paper “*Secure e-health system on passive RFID: outpatient clinic and emergency care*” introduces a robust RFID-based e-health system which strengthens the system security, protects the patient’s privacy, and outperforms its counterparts in terms of efficiency.

The paper “*A case study on the power-aware protocol framework for wireless sensor networks*” discusses the challenges of designing power-aware protocols which are capable

of operating for long periods of time under harsh conditions. This paper proposes to develop a cross-layer architecture, integrating smart and power-aware protocols at the physical and MAC layers with a low-cost high efficiency power management module (denoting ATON II) which are the basis of long-lasting WSN. The experiments show a long-endurance outdoor operation with a low complexity power management unit.

The paper “*Applying an ontology to a patrol intrusion detection system for wireless sensor networks*” proposes a lightweight ontology-based wireless intrusion detection system (OWIDS). The system applies ontology to a patrol intrusion detection system (PIDS). The system constructs the relationship between the sensor nodes in an ontology database to enhance PIDS robustness. The experiments show that OWIDS can reduce intrusion detection system (IDS) energy consumption.

The paper “*Design and implementation of zigbee-ontology-based exhibit guidance and recommendation system*” proposes and implements a new WSN-based application—an exhibit guidance and recommendation system. Taking advantages of Zigbee and ontology, this intelligent and personalized guidance service system overcomes the limitations and weaknesses of conventional guidance systems and provides online user with status monitoring and real-time recommendation service.

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Nai-Wei Lo