Editorial

Ubiquitous Sensor Networks and Its Application

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This special issue contains 24 articles among totally 125 papers accepted in the UCMA 2011 and AST 2011 after submission. Achieving such high-quality papers would have been impossible without the huge work that was undertaken by the International Program Committee members and external reviewers. We take this opportunity to thank them for their great support and cooperation.

Ubiquitous sensor networks and its application are emerging rapidly as an exciting new paradigm to provide reliable and comfortable life services. The ever-growing ubiquitous sensor networks and its application will provide an intelligent and ubiquitous communication and network technology for tomorrow. That is, the UCMA have emerged rapidly as an exciting new paradigm that includes ubiquitous, grid, and peer-to-peer computing to provide computing and communication services at anytime and anywhere. In order to realize the advantages of such services, it is important that intelligent systems be suitable for UCMA.

In "*Logic macroprogramming for wireless sensor networks*," authors evaluated Sense2P analytically and experimentally. Their evaluation result indicates that Sense2P successfully realizes the logic macroprogramming concept while consuming minimal energy as well as maintaining completeness and soundness of the answers.

Authors propose a traffic rerouting scheme in wireless communication infrastructure for islanded microgrid, in "*Traffic rerouting strategy against jamming attacks in WSNs for microgrid.*" Authors determine disjoint multiple paths as candidates of a detour path and then select the detour path among the candidates in order to reduce the effect of jamming attack and distribute traffic flows on different detour paths.

The paper "*CA$_{5W1H}$ Onto: ontological context-aware model based on 5W1H*" proposes an ontology-based context-aware modeling technique, along with a relevant framework, in order to enable efficient specification of contextual information and, thereby, further to provide intelligent context-aware services for context management and reasoning.

In "*An energy efficient localization-free routing protocol for underwater wireless sensor networks,*" authors propose an energy efficient routing protocol, named EEDBR (energy-efficient depth-based routing protocol) for UWSNs. EEDBR utilizes the depth of sensor nodes for forwarding data packets. Furthermore, the residual energy of sensor nodes is also taken into account in order to improve the network life time.

In "*A novel coverage enhancement algorithm for image sensor networks,*" based on virtual potential field, the Paired tangent point repulsion for nonboundary sensor nodes

and fuzzy image recognition for boundary sensor nodes realize the enhancement of perspective coverage, together with LRBA, MBAA, and mixed superposition algorithm for rotation angle adjustment.

In "*A communication framework in multiagent system for islanded microgrid*," authors design a communication framework to control and operate distributed sources and loads in the islanded microgrids. The framework reliably delivers microgrid control frame between agents by employing wireless mesh network as an advanced topology of the wireless sensor network.

The paper "*Real-time train wheel condition monitoring by fiber Bragg grating sensors*" describes a real-time system to monitor wheel defects based on fiber Bragg grating sensors. Track strain response upon wheel-rail interaction is measured and processed to generate a condition index which directly reflects the wheel condition.

The paper "*Energy-efficient fire monitoring over cluster-based wireless sensor networks*" proposes an energy-efficient fire monitoring protocol over cluster-based sensor networks. This proposed protocol dynamically creates and recognizes the sensor network cluster hierarchy according to the direction of fire propagation over the sensor network clusters.

The purpose of the paper, "*Networked Electronic Equipments using the IEEE 1451 Standard: VisioWay, a Case Study in the ITS Area*" is to analyze the integration of electronic equipments into intelligent road-traffic management systems by using the smart transducer concept. An automated video processing sensor for road-traffic monitoring applications is integrated into an ITS network as a case study.

In "*The vegetable freshness monitoring system using RFID with oxygen and carbon dioxide sensor*," authors use a sensor for monitoring gases and combine the sensor with an RFID tag. The RFID system is relatively easy to manage. With this combined system, we estimated the freshness of vegetables.

The paper "*An adaptive system supporting collaborative learning based on a location-based social network and semantic user modeling*" presents an adaptive e-learning system which supports collaborative learning based on a location-based social network and semantic modeling. In the system, a social network among e-learning learners is dynamically constructed on the basis of the location information of learners using GPS sensors for collaborative learning.

The paper "*Design of an effective WSN-based interactive u-learning model*" presents a model of an effective and interactive ubiquitous learning environment system based on the concepts of ubiquitous computing technology that enables learning to take place anywhere at any time.

In "*A local world evolving model for energy-constrained wireless sensor networks*," authors aim at improving the interactions among sensor nodes and present a heterogeneous local-world model to form large-scale wireless sensor networks based on complex network theory.

In "*An energy supply system for wireless sensor network nodes*," the overall system structure, the function modules design, and the performance testing analysis are illuminated in detail. Experimental results reveal that this energy supply system can significantly improve power within the wide bands by the active piezoelectric energy harvesting technology and enable wireless sensor network nodes to operate normally.

In the paper "*Reliable latency-aware routing for clustered WSNs*," a unique latency sensitive reliable routing protocol for WSNs has been proposed. This protocol uses the concept of hotlines (high-reliable links) and also utilizes alternative routes to reduce the number of hops from the source to the sink.

The paper "*An optimization scheme for M2M-based patient monitoring in ubiquitous healthcare domain*" performs optimization scheme movement coordination technique and data routing within the monitored area. A movement tracking algorithm is proposed for better patient tracking techniques and aids in optimal deployment of wireless sensor networks.

In the paper "*A dynamic traffic-aware duty cycle adjustment MAC protocol for energy conserving in wireless sensor networks*," a dynamic traffic-aware MAC protocol for energy conserving in wireless sensor networks is proposed. The proposed MAC protocol can provide better data transmission rate when sensors with high traffic loading.

In "*Grid-based predictive geographical routing for inter-vehicle communication in urban areas*," authors propose a grid-based predictive geographical routing (GPGR) protocol, to which overcomes these problems. GPGR uses map data to generate a road gird and to predict the exact moving position of vehicles in during the relay node selection process.

In "*A wireless sensor network for precise volatile organic compound monitoring*," A variety of methods have been developed to monitor VOC concentration in hazardous sites. The methods range from calculation to measurement, and from point measuring to remote sensing.

The paper, "*The construction of inference engine for meaningful context and prediction based on USN environment*" proposes to design for this through application of context inference of USN (ubiquitous sensor network) and inference production rules for context inference engine of wetland management system by using JESS.

In the paper "*An ACOA-AFSA fusion routing algorithm for underwater wireless sensor network*," a novel ACOA-AFSA fusion algorithm for UWSN routing protocol has been presented. It is a useful routing algorithm for underwater sensor networks owing to its local acknowledge and global view offered by ACOA and AFSA, respectively.
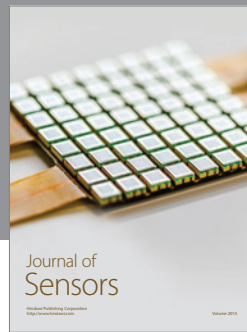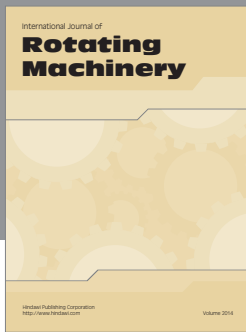
In "*Improved virtual potential field algorithm based on probability model in three-dimensional directional sensor networks*," authors propose a 3D directional sensor coverage-control model with tunable orientations. Besides, a novel criterion for judgment is proposed in view of the irrationality that traditional virtual potential field algorithms brought about on the criterion for the generation of virtual force.

In the paper "*A network coding based rarest-first packet recovery algorithm for transmitting geocast packets over hybrid sensor-vehicular networks*" a network coding based rarest-first packet recovery algorithm for transmitting geocast

packets over hybrid sensor-vehicular-networks is proposed.

The paper, "*Anchor-node-based distributed localization with error correction in wireless sensor networks*" proposes a scheme to enhance localization in terms of accuracy and transmission overhead in wireless sensor networks. This scheme starts from a basic Anchor node-based distributed localization (ADL) using grid scan with the information of anchor nodes within two-hop distance.

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