

## FOREWORD

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We are very glad that we can introduce this special issue on Interactive Multimedia and Intelligent Services in Mobile and Ubiquitous Computing in the Journal of Computing and Informatics. The contributions presented in this issue were selected from the outstanding papers in the 2007 International Workshop on Interactive Multimedia and Intelligent Services in Mobile and Ubiquitous Computing

(IMIS '07). IMIS is a series of the international workshop which focuses on challenges and solutions for mobile and ubiquitous computing (MUC) with an emphasis on interactive multimedia and intelligent services. The basic idea of this workshop series was a response to the fast growing interest in MUC. MUC enables to create a human-oriented computing environment where computer chips are embedded in everyday objects and interact with the physical world. Through MUC, people can get online even while moving around, thus having almost permanent access to their preferred services.

In this issue, nine representative research papers were selected from the best original conference contributions with the latest research results of their authors. All of these contributions have been afterwards rigorously reviewed by external reviewers.

The issue starts with the paper entitled "Integration between WSNs and Internet based on address internetworking for web services", co-authored by Jeong-Hee Kim, Do-Hyeon Kim, Ho-Young Kwak, and Yung-Cheol Byun. The authors tried to meet the demands for internetworking technology between wireless sensor networks and the Internet based on IP address. This paper proposed an internetworking scheme which allocates IP addresses to the sensor node and internetworking based on the gateway-based integration for internetworking between wireless sensor networks and the Internet. The proposed scheme makes the access to wireless sensor networks be served like the web service with internetworking the Internet IP address and a ZigBee address which is allocated to the sensor node in wireless sensor networks. The authors also experimented to validate the proposed scheme using Berkeley TinyOS, Mica Motes, and dual protocol stack based on ZigBee and IP.

The paper entitled "Moving object detection and tracking in open-air test bed", co-authored by Tatsuya Yamazaki, Tetsuo Toyomura, Kentaro Kayama, and Seiji Igi, introduced a test bed with multiple sensors: floor pressure sensors, RFID (radio frequency identification) tag systems, and cameras, as an open air environment for detecting and tracking people as moving objects. Especially, the authors adopted the conventional background subtraction method by using multiple cameras to detect and track people. In order to improve the background subtraction method, they proposed knowledge application and parameter adaptation.

The paper entitled "The design and development of security system for sharing engineering drawings in u-environment", co-authored by Hangbae Chang, Kyungkyu Kim, and Yeongdeok Kim, dealt with security issues in the field of manufacturing industry to protect valuable intellectual property which is not available to competitors when internal users share engineering drawings to finish a design task. As most of CAD (Computer Aided Design) drawings are composed of a collection of files with various extensions, there exist problems associated with the processing speed and the accuracy of CAD files encryption (decryption) using file based secure methods. In this paper, a system of securing CAD files based on the workplace against illegal piracy of design knowledge was presented. The proposed technology stores all design files in the secure workplace, called Virtual Secure Disk, which can

be accessed by the authorized users and design applications only using Application Programming Hooking at user level and System Service Table at kernel level. The technology was demonstrated in this paper using its implementation example in an automobile company.

The paper entitled “Group-based key management protocol for energy efficiency in long-lived and large-scale distributed sensor networks”, co-authored by Kwang-Jin Paek, Jongwan Kim, Chong-Sun Hwang, Sang-Keun Lee, and Ui-Sung Song, proposed a cryptographic key-management protocol, called an energy-efficient key-management (EEKM) protocol for wireless sensor networks. The design was motivated by the observation that unicast-based rekeying does not meet the security requirements of periodic rekeying in long-lived wireless sensor networks. EEKM supports broadcast-based rekeying for low-energy key management and high resilience. In addition, to match the increasing complexity of encryption keys, the protocol uses a dynamic composition key scheme. EEKM also provides group-management protocols for secure group communication.

The paper entitled “SVM based indoor/mixed/outdoor classification for digital photo annotation in a ubiquitous computing environment”, co-authored by Chull Hwan Song, Seong Joon Yoo, Chee Sun Won, and Hyoung Gon Kim, proposed new feature vectors for better annotation of indoor/outdoor images and seven nature objects using SVM for digital photo annotation that can be utilized for automatically annotating digital photos anytime and anywhere. This method is one of the components for digital image annotation. A digital camera or an annotation server connected to a ubiquitous computing network can automatically annotate captured photos using the proposed method.

The paper entitled “Sink independent model in wireless sensor networks”, co-authored by Sang-Sik Kim, Kwang-Ryul Jung, Ki-Il Kim, and Ae-Soon Park, showed a routing algorithm for mobile users to gather data efficiently from sensor nodes due to user mobility. The authors proposed a view of mobility for wireless sensor networks and a model to support user mobility that is independent of sinks.

The paper entitled “An adaptive context-aware transaction model for mobile and ubiquitous computing”, co-authored by Feilong Tang, Minyi Guo, Minglu Li, and Ilsun You, focused on transaction management for mobile and ubiquitous computing (MUC) to provide mobile users with reliable and transparent services anytime and anywhere. Traditional mobile transaction models built on client-proxy-server architecture cannot make this vision a reality because 1) in these models, base stations (proxy) are the prerequisite for mobile hosts (client) to connect with databases (server), and 2) little models consider context-based transaction management. In this paper, the authors proposed a new network architecture for MUC transactions, under which people can get online network access even while moving around; and design a context-aware transaction model and a context-driven coordination algorithm adaptive to dynamically changing transaction context.

The paper entitled “MANETs: an exclusive choice between use and security?”, co-authored by Pierre-Francois Bonnefoi, Damien Sauveron, and Jong Hyuk Park, defined what a MANET should be for a real use. Also, it explained what the

security challenges are and analyzed the problems of the existing proposal to secure such network.

The final paper entitled “Moving P2P live streaming to mobile and ubiquitous environment”, co-authored by Xiaofei Liao, Hai Jin, and Wenbin Jiang, discussed the challenges of media streaming services for the end hosts are mobile over heterogeneous wireless access networks, such as network detection, handoff, join and leave latency, and desired level of quality of service, as well as caching. The authors also introduced the implementation of a hybrid live streaming system, AnySee Mobile, under wired and wireless environment. Their work is based on their previous experience in deploying a distribution system of media streams over a wired network in peer-to-peer fashion, called AnySee. In AnySee-Mobile, one wireless peer will be selected to act as an agent. One agent has two main functions, to request media from P2P overlay network as a normal peer, and to multicast media to WLAN as a multicast source. They also studied the means to elect one multicast agent in WLAN. Several experiments have been performed and proven that the system has good user experience and performance.

We would like to express our special thanks to not only all authors and reviewers who made this issue happen, but also guest editorial board member of this special issue who are P. K. Mahanti of the University of New Brunswick in Canada, Witold Pedrycz of the University of Alberta in Canada, Jong-Hoon Youn of the University of Nebraska at Omaha in USA, Mei-Ling Shyu of the University of Miami in USA, Geyong Min of the University of Bradford in UK, Liudong Xing of the University of Massachusetts – Dartmouth in USA, and Chengcui Zhang of the University of Alabama at Birmingham in USA. We wish all the readers of the special issue an interesting and worthwhile reading.



**Hai Jin** is a Professor of computer science and engineering at the Huazhong University of Science and Technology (HUST) in China. He is now the Dean of School of Computer Science and Technology at HUST. He received his Ph.D. in computer engineering from HUST in 1994. In 1996, he was awarded German Academic Exchange Service (DAAD) fellowship for visiting the Technical University of Chemnitz in Germany. He worked for the University of Hong Kong between 1998 and 2000 and participated in the HKU Cluster project. He worked as a visiting scholar at the University of Southern California between 1999

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