Special Issue on “Recent Trends on Convergence Personal Wireless System”

Selected Topics from the ICITCS Conference on December 5–7 2012 in Pyeongchang, Korea

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Welcome to the special issue of Wireless Personal Communications. This special issue contains a collection of the best papers from the 2nd International Conference on IT convergence and Security which was held in Pyeongchang, Korea from December 5th to 7th, 2012. The main goal of International Conference on IT convergence and Security is to bring together researchers from academia and practitioners from different industries to share ideas, problems, as well as solutions. This conference also aimed to meet the demands of the academia and practitioners from related industries, where we believe it is one of the most comprehensive conferences focused on solving problems occurring in industrial computing environments and providing high-demand technology.

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This special issue presents the recent researches in convergence wireless personal system for better performance and availability as well as for avoiding vulnerabilities, whose topics are certainly the hottest topics in Convergence Personal Wireless System. We believe that this special issue will have a high citation in the areas of wireless personal communications.

- Personal Computing for Convergence System
- Personal and Content Protection
- Audio, Video, Image Processing for Convergence
- Digital Signal Processing for Personal Communications
- Wireless Communications and Networking
- Information System for Personal Computing
- Digital Management for Personal Communications
- Wireless Personal Communications and Appliances
- Personal Information Extraction Algorithm
- Indexing, Searching, and Visualization
- Wireless Communications and Computing

The first paper by Kim et al. presented a convergence security system for preventing leakage of internal information. This is a convergence security system that is capable of preventing the leakage of internal information as well as tracing the information leaker by blocking the used ports such as FTP, messenger, cloud, etc. The proposed system detects abnormal symptoms such as the leakage of information inside and operating a mail backup server. The TCP packet monitoring method is capable of detection of abnormal symptoms, grasping the destination, and prompt post-action, and it shows the weakness for grasping the leaker and leaked contents as well as securing safety against internal attack.

The second paper by Lee et al. introduced a wireless IP camera that is used to expand monitoring ranges in existing physical spaces in order to propose a security service structure that can support instantaneous detection and responses to disasters. Using this method, it is possible to provide flexibility in determining threatening factors dynamically and responding to them in a physical security region that uses labor and equipment under the formal security policy. Further, the information obtained from external environments is defined through determining problems, which can be generated by providing physical security services, figuring solutions in a procedural manner, and analyzing the causal relationship between variables.

The third paper by Yoo et al. showed the novel secure scheme for a wireless Ad hoc network. The proposed method is a cache management technique to manage that removes the threat of malicious nodes through authentication of reliable nodes as well as reduces the delay time of cache search. The structure has an advantage in finding desired data by utilizing limited resources and bandwidth. Fairness of the trust evaluation for mobile nodes is improved, and the accuracy of trust evaluation can be increased using the reliability value received from neighboring nodes.

The fourth paper by Jung et al. presented home health gateway-based healthcare services through The U-health platform. For this, they proposed a home health gateway-based healthcare service through the U-Health platform. The proposed U-health platform allows users to enjoy the contents of various special service providers in a multi-device environment. The service distributors provide information on diets, workouts, and health, and the users are given the most appropriate contents through the intellectual information provision service.

The fifth paper by Kim et al. showed the numerical analysis of airflows in a traditional Korean house. This investigation examined the thermal behaviors of airflows inside a tradi-

tional Korean house made of construction materials. For this purpose, they conducted numerical predictions of airflows depending on the temperature distribution inside the house. The thermal properties for the calculation were procured by parallel measurements. The transient numerical experiments were performed according to house type, weather conditions, and operating time of heating. The details of airflows and temperature in the houses illustrated that the thermal design of traditional Korean houses satisfy living requirements.

The sixth paper by Suh et al. introduced a perceived quality measurement model supporting full session mobility in multimedia service delivery. The purpose of this system focuses on video quality measurement in a seamless video service delivery process considering the mobility patterns of users. Further, the optimal video delivery switching point to enable a user mobility-based video service is studied through the quality analysis of host mobility services at varying distances among the hosts. The results of simulation of their proposed system showed that the quality model has a high correlation with assessed quality and is useful to enable adequate seamless mobility for multimedia service delivery.

The seventh paper by Chung et al. introduced an interactive design recommendation system using sensor-based smart wear and the weather WebBot. The purpose of this system is to increase the efficiency of merchandising for human-oriented sensibility product designs. A user interface and collaborative filtering of textile and fashion designs are used to satisfy a user's needs. The feedback information given by users is stored in the database, and when a given user logs into the system again, the system provides more accurate recommendations using the altered preference information. Textile and fashion merchandising may meet a customer's needs more precisely and easily using this system. This will result in quicker responses and stimulate the fashion industry nationwide.

The eighth paper by Sung et al. proposed a Q-learning reward propagation method for reducing the transmission power of sensor nodes in wireless sensor networks. This is a reward propagation method (RPM), i.e., a method that integrates various updating algorithms to propagate the reward of the goal state to more Q-values, thus reducing the learning time required for Q-learning. For this purpose, they compared RPM with conventional Q-learning in three experiments based on a hunter-prey game mapped to a WSN environment. This experiment showed that obstacles affected the success rate of both methods and narrowed the difference in performance between RPM and conventional Q-learning. This result was due to a decrease in the number of propagated rewards caused by the obstacles. Overall, the results of these experiments verified that RPM can reduce the learning time of Q-learning.

The ninth paper by Hong et al. introduced an effective personalized service provision scheme based on virtual spaces for a ubiquitous computing environment. The purpose of this research was to propose an efficient management scheme for the virtual personal world, which is a model focused on service continuity of the personal world. When they regulated the number of spaces, pre-defined service, and VOs, they observed steady increases at the beginning that later closed at a convergent level. This means that user-generated services satisfy users with time.

The tenth paper, an efficient gaming user-oriented load balancing scheme for MMORPGs authored by Kim et al., proposed two schemes: taking care of neighboring gaming users in one server by searching for nearby gaming users when one logs in and lessening the load that occurs by server relocation by using gradients between servers to relocate the servers, resulting in a common critical section. This scheme is more effective at dealing with hot-spots and other gatherings of gaming users at specific servers compared to previous methods.

The eleventh paper by Lee et al. presented an efficient sport target scene extracting methodology for a P2P-based personal mobile beaming broadcasting service using a smartphone. The proposed method extracts and displays a specific context of the target scene from whole scenes by considering optimal viewer visual sight on devices. They used P2P manner for mobile personal beaming broadcast through the UDP protocol. Due to packet loss in communication, the UDP protocol method was used to provide a seamless service. The simulations show that the proposed method is useful to enable an adequate seamless multimedia service for a wireless environment.

The twelfth paper by Baek et al. showed dynamic reconfiguration based on a goal-scenario by an adaptation strategy. They provided rapid dynamic reconfiguration using workflow based on a goal-scenario as the basis to set up strategies in accordance with adaptive judgment. Their approach uses estimates based on a goal-scenario to determine which remaining parts of running workflows are affected by the external environment as well as to perform suitable adaptation. This helps ensure that necessary adaptations are performed in time with minimal user interaction, which is especially valuable in an external environment.

The thirteenth paper by Lim et al. introduced the detection and trace back of illegal users based on an anonymous network in a bit-torrent environment. They suggested three methodologies for prohibiting the sharing of illegal digital contents through torrents. The first step is to block the torrent site, the second is to block the tracker, and the third is to block Exit nodes. The second case is problematic since some trackers operate for normal purposes. As a result, they verified that the technology attacking the new vulnerability can paralyze the functions of a windows system PC and smartphones using Android OS. Further, the routing packets are discarded before they reach the destination, and the connection to the destination host cannot be established.

The fourteenth paper by Sohn presented a constraint satisfaction approach to the reader collision problem in dense mode environments for static RFID networks. This method assigns available channels and time slots to RFID readers to increase the read rate while also satisfying all interference constraints. For the purpose of finding good heuristics, a problem-classifying rule is applied to improve the quality of the variable orderings. These algorithms are a combination of dynamic and static variable orderings, which are the most suitable for DS-type problems.

The final paper by Kang et al. proposed a bio-interactive healthcare service system using lifelog-based context computing. Various noise signals were grouped into six categories by context estimation and effectively reconfigured into noise reduction filters by a neural network and genetic algorithm. This system uses a distributed self-growing framework that can be applied to adaptive systems under dynamic environments by taking advantage of lifelog-based context-awareness, self-growing architecture, and context knowledge base.

This fine collection of papers was achieved by fruitful collaborations. We gratefully acknowledge and express heartfelt thanks to all the authors for their worthy contribution to this special issue. We also would like to thank all the members of the Program Committee and anonymous reviewers for their help in identifying the novel papers and for their careful reading of earlier drafts. Furthermore, we would like to thank Professor Ramjee Prasad, editor-in-chief of the international journal *Wireless Personal Communications*, for his valuable remarks and his undeterred help throughout the publication process of this special issue.

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