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Convergence Interaction for Communication

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Welcome to this special issue of Wireless Personal Communications. This issue contains a collection of the best papers out of various authors who have been submitted to this issue. The main goal for this issue is to be a timely vehicle for publishing selected research papers from practitioners and academia in convergence industries on this emerging topic. This issue covers some of the hottest topics in Convergence Interaction for Communication, including: convergence; interactive applications; cloud service; P2P architectures and wireless protocols; data and index structures; motion recognition; future communication system; hybrid networking system; spectrum resource allocation; personal networking and architectures; multiple access techniques; multicasting and computer communications.

The paper by Mun et al. [1] proposes the injecting of a subject policy into access control to strengthen the protection of personal information. This study provides two confidential access control models that apply individually established policies to the role-based access control model (RBAC) and the mandatory access control model (MAC) technologies. In the SpRBAC model, a user's right to access would follow organizational policy, and accessing personal information would be restricted by the subject policy. In the SpMAC model, users would have to satisfy the subject policy established by the provider of the information, in addition to the requirements of the normal MAC policy. The paper by Lee et al. [2] presents variability change management using orthogonal variability model-based traceability. The proposed method is an approach to tracing variability based on explicit

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variation points defined in an orthogonal variability model and domain artifacts. They validate the proposed approach through the calculator product line.

The paper by Oh et al. [3] proposes voice activity detection using an improved unvoiced feature-normalization process in noisy environments. The proposed model's recognition is one that extracts characteristics for classification of voiced and unvoiced signals with a high signal-to-noise ratio (SNR). The model affects noise for voice characteristics less, and recognition performance improves by using the cepstrum feature distribution property of voiced and unvoiced signals with a low SNR. The paper by Noh [4] introduces authentication and security of financial settlements using finger vein technology in a wireless internet environment. This study suggests a finger vein technology method that can simplify cyber-financial services and easily solve safety concerns, particularly for ATMs, smart phones, and laptops, thus providing a clue for authentication issues in financial industries.

The paper by Kim et al. [5] proposes a software vulnerability detection methodology combined with static and dynamic analysis. This study provides a method to combine static and dynamic detection to reduce false positives created from static vulnerability detection. The proposed method verifies vulnerability by implanting a fault, based on the information received from static code analysis. The paper by Jeon et al. [6] presents new performance assessment modeling, and the development of a performance assessment system for cloud services. This study suggests a model for assessing the performance of a cloud service, and a performance assessment system based on the modeling, in order to provide a standard for cloud service users to rely on, so they can select cloud services that are suitable to their needs by providing objective and quantitative comparison and assessment results.

The paper by Chae et al. [7] proposes an information interoperability system using a multi-agent with security. The task and task analysis requiring the information connection in the distributed environment increases, and decision support using the system becomes more important. They attempt to resolve security issues by mutual authentication between agents using certificates and session keys. The paper by Choi [8] proposes an image-selection algorithm for a digital radiography training simulator. This study implements a method to develop an unprecedented radiography training simulator. The proposed method seeks to improve the quality of practical training by proposing a method for acquiring an image that will be used in a database in the simulator, as well as a method for creating an algorithm so that concerns of radiation exposure by students can be addressed, and limitations of practical training using an anthropomorphic phantom can be eased.

The paper by Ahn et al. [9] introduces a conceptual design for job pre-processing flow for heterogeneous batch systems in a data center. The proposed method is transparent between clients and batch systems, accurate in terms of monitoring and prediction of the available resources, and scalable for additional batch systems. The paper by Park et al. [10] proposes a method for measuring cooperative activities in a social network-supported learning environment. This study is a group cooperative activity (GCA), and an analysis of the computer-generated log data among learners as a method to quantitatively measure cooperative learning among users in an online learning environment.

The paper by Kim et al. [11] proposes cyber-physical system-based convergence operation of data-intensive computing resources. This study takes into account the modification of computing resources, other changes resulting from such modifications, and information reflecting modifications in the physical world. The proposed method uses a mobile device and a wireless network to facilitate conversion between the physical world and the cyber world. The paper by Kim et al. [12] suggests an algorithm for perspective transform-based PDF417 barcode recognition. The proposed method is a novel

segmentation and normalization method in PDF417 that aims to improve recognition rate and precision. The segmentation process to detect the barcode area in an image uses the conventional morphology and Hough transform methods.

The paper by Na et al. [13] presents information security evaluation using a multi-attribute threat index. The study is on decision-making methods for the selection of information security technology and solutions through a process of identifying risks and with a quantifying threat index. The paper by Kim et al. [14] suggests a 3D human-gesture interface for fighting games using a motion recognition sensor. Recognizing gestures in the motion recognition sensor environment, the motion characteristics of gestures are extracted by using joint information obtained from the motion recognition sensor, and 3D human motion is modeled mathematically.

The paper by Lyu et al. [15] proposes sentiment analysis using word polarity in social media. This study classifies the sentiments of words and assesses the sentiment weights by analyzing the sentiments of a large volume of lexical resources collected from social media. The paper by Ko et al. [16] proposes an economic calibration method for a fuel consumption model in HDM4. This study is a fuel-consumption testing method for quick and easy determination of the calibration factors in HDM4 vehicle operating cost calculation. The calibration for fuel consumption is performed by measuring fuel consumption for round trips on two flat and straight roads at several steady speeds for a short period of time.

The paper by Kim et al. [17] proposes a cloud computing-based analysis system for national research and development (R&D) information concerned with data security. The proposed NTIS cloud service provides the raw data of the national R&D information to researchers who need a range of analysis for project planning and research paper and patent publication planning. The paper by Kim et al. [18] proposes a method of elaborating and detecting brain tumors from magnetic resonance imaging suitable for information sharing via the internet for a health care provider. The proposed method clarifies the brain tumor area using modified K-means clustering and fuzzy C means (FCM) clustering methods for efficient image data processing with reduced file sizes. The paper by Kim et al. [19] suggests a mining-based urban climate disaster index service based on potential risk. This study uses FP-Tree for data mining to extract association sets among weather indexes. The extracted association sets are used to calculate potential risks. An urban climate disaster index is calculated by using potential risks, user context information, and emerging risks.

This fine collection of papers was achieved by fruitful collaboration. We wish to thank all the authors for their contributions and the reviewers for assisting our editorial work. We do hope that the papers included in this special issue will satisfy the audience of Wireless Personal Communications and readers will find them interesting. 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 special issue.

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