Editorial

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Biographical notes: Sang-Yeob Oh received his BS in Computer Science from Kyungwon University in 1989 and MS and PhD from Kwangwoon University, Korea, in 1991 and 1999, respectively, from the Department of Computer Science. He is currently a Professor in the Division of Computer Media, Gachon University, Korea. His research interests include speech recognition, vehicle safety communications, and HCI. He has edited 27 books of computer science. He serves as the Executive Editing Director of International Conference on Digital Policy Management, Executive Editing Director, and Steering Committees of International Conference on Convergence Technology. Also, he is an editorial member of the *International Journal of Wireless Personal Communications*, etc.

Supratip Ghose graduated from the Department of Applied Physics and Electronics, University of Rajshahi, with a BSc and MSc in 1995 and 1998, respectively, and received his PhD in Information Engineering, from the Department of Computer Science and Information Engineering, Inha University, South Korea, in 2007. He began his academic career as an Adjunct Lecturer at Inha University. After obtaining his PhD, he served as an Assistant Professor in the Department of Computer Science and Engineering in UIC-BNU-HKBU in Zhuhai, China, the University of Saint Joseph, Macau, China, and Brac University in Dhaka, Bangladesh. He is currently serving as an Associate Professor in the Department of Computer Science and Engineering, University of Information Technology and Sciences, Dhaka, Bangladesh. His

research interests include data mining, collaborative filtering, sentiment analysis in social webs, IR frameworks, and activity recognition in smartphones.

Kyung-Yong Chung is a Professor in the Computer Information Engineering Department at Sangji University, Korea. He worked for the Software Technology Leading Department, Korea IT Industry Promotion Agency (KIPA) in 2005. He received his BS, MS, and PhD in Computer and Information Engineering from Inha University in 2000, 2002, and 2005, respectively. His research topics include data mining, telemedicine, knowledge-based decision support systems, intelligent systems, convergence, HCI, and recommendation systems. He serves as a General co-Chair of International Conference on Information Science and Application 2013, General co-Chair of 2nd International Conference IT Convergence and Security 2012, Executive Editing Director, and Steering Committees of International Conference on Convergence Technology (ICCT). Also, he is an editorial board member of several international journals.

The advances in information technology (IT) convergence have led to the development and operation of data as a knowledge-based system after digitisation (Jung et al., 2013b). The phrase, *intelligent information system*, implies the use of services, such as prediction, decision, treatment, and management, utilising IT convergence of frameworks and paradigms. As a broader concept of service than conventional services, intelligent information systems include the service provided using wired and wireless IT infrastructure and devices. A typical intelligent service includes ubiquitous commerce (u-commerce), u-learning, u-health, context awareness, recommendations, human UI/UX, management, monitoring systems, and telemedicine. Intelligent information systems for the convergence environment pose many research challenges. Among these includes the processing overhead in a service environment (Weiser, 1991; Chung, 2013; Jung et al., 2013a; Oh and Chung, 2013a, 2013b). Therefore, novel techniques, architectures, algorithms, experiences regarding multimedia applications, and industry services should be considered. Some of these research areas are listed below.

- ubiquitous computing for convergence
- software infrastructure, middleware and frameworks for convergence information
- mobile and wearable computing for convergence information
- agent technology in convergence information systems
- convergence information applications in u-commerce, u-learning, u-health
- innovative applications of convergence information
- cooperative design in convergence environments
- artificial intelligent methodologies for convergence information
- speech recognition, voice recognition for convergence information

- convergence context-aware and HCI technologies
- convergence information indexing, searching, and visualisation
- intelligent information extraction algorithms.

This special issue is devoted to one of the hottest topics in intelligent information systems for convergence, and is expected to be cited widely in the areas of intelligent information and database systems.

Roh and Lee present a 3D tangible-serious game for attention improvement. They propose a child-friendly attention improvement model using children's favourite games. For this purpose, a method to measure the four variables used in ADS and TOVA is used as the measurement variables of attention in the game. The game aims to improve the attention span of children. The game quest is composed of contents related to visual and auditory attention training. They verify that children participated voluntarily and pleasantly in the experiments.

Another paper by Lee introduces an optimisation of the cascade correlation algorithm to solve the two-spiral problem using cosine-modulated Gaussian and sigmoid activation functions that is applied to an analysis of the pattern recognising condition of input space by selecting a pre-existing problem of the two spirals. The first optimisation method for the cascade correlation algorithm composes and tests several pools to apply a range of sigmoid functions to the algorithm. The second method seeks the optimal parameter of the sigmoid functions using the genetic algorithm, and then learns using these values. The experiment results confirm that the pattern recognising capability of the cascade correlation algorithm is improved significantly and optimised.

Hong presents a security service (sec-service) agreement analysis of output feedback (OFB) mode in a block cipher. In general, the security service level agreements (SLAs) represent the understanding between the service provider and client regarding the expected level of the security service. In particular, with cipher communication, sec-SLA issues must consider the error rate effect from the operation mode of a block cipher in the fading channel. This paper reviews the probabilistic error rate of the OFB mode of a block cipher in a wireless channel. They consider the requirements to establish the optimal sec-SLA specifications through an analysis of the error rate condition of the OFB mode of the block cipher. In a wireless fading channel, the error rate in OFB mode is affected less than in CBC and CFB mode.

Ramesh and Kumar introduce a byzantine transaction commit protocol-based recovery algorithm for a distributed database environment. They prefer to use byzantine agreement among the coordinator messages, which avoids the problems of faulty occurrences. On the other hand, the BFT is designed to ensure atomic requests to a replicated server (where the failure instances are easily predictable). For this purpose, they make some modifications to the algorithm to allow it to fit the problem of a distributed commit. The use of such a decision is essential for enabling a correct backup coordinator replica to examine the primary proposal. This also limits the methods that a faulty model can use to delay a distributed commit of a transaction.

Jo and Lim report the results of a comparative analysis of the effectiveness of improving English vocabulary with a smart device versus printed materials. Repetition is the most effective way of improving vocabulary, which is learned from the lexical decision task (LDT) experiment based on neuro-scientific studies. In addition, comparative analysis of the learning effectiveness from smart devices versus printed

materials is performed. For that purpose, a comparative analysis of the learning effects of smart learning based on an LDT is reported. In their study, the participants were divided into two groups: a group that used smart devices and a group that used in-classroom material, such as textbooks. These two methods are useful tools for examining the learning effects on students.

Kang and Nam examine the effects of syllable boundary and context on word recognition in Korean continuous speech. They report the role of syllables and the interaction between the syllable boundary and context in Korean spoken word recognition during lexical processing. They confirm that the syllable is a basic unit of the segmentation process, as well as the interaction between the syllable boundary and context.

Finally, Kang et al. propose a watermarking scheme to prevent the disclosure of information from the insertion position of a watermark. In the proposed watermarking scheme, forgery and tampering of the image and watermark by a third party is made difficult by adjusting the position where the information is inserted using a threshold value, thereby allowing verification of the copyright holder of the image. The experimental results show that the optimal threshold value is 3, and a loss of original image quality can occur as this value is increased.

This fine collection of papers was accumulated by fruitful collaboration. We gratefully acknowledge and express our heartfelt appreciation to all the authors for their excellent contributions to this special issue. We would also like to thank all the members of the ICCT, ICDPM Program Committee and anonymous reviewers for their help in identifying novel papers and for their careful reading of earlier drafts to select seven high-quality papers out of 17 papers submitted – a 41% acceptance rate. Furthermore, we would like to thank Professor Ngoc Thanh Nguyen, Editor-in-Chief of the *International Journal of Intelligent Information and Database Systems*, for his valuable remarks and help throughout the publication process of this special issue.

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