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## Preface

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**Biographical notes:** Jong Hyuk Park received his PhD in Graduate School of Information Security from Korea University, Korea. From December, 2002 to July, 2007, he had been a Research Scientist of R&D Institute, Hanwha S&C Co., Ltd., Korea. From September, 2007 to August, 2009, he had been a Professor at the Department of Computer Science and Engineering, Kyungnam University, Korea. He is now a Professor at the Department of Computer Science and Engineering, Seoul National University of Technology, Korea. He is the Editor-in-Chief (EiC) of *International Journal of Information Technology, Communications and Convergence (IJITCC)*, Inderscience. He was the EiCs of the *International Journal of Multimedia and Ubiquitous Engineering (IJMUE)* and the *International Journal of Smart Home (IJSH)*. He is an Associate Editor/Editor of 14 international journals including eight journals indexed by SCI(E). His research interests include security and digital forensics, ubiquitous and pervasive computing, context awareness, multimedia services, etc.

Jong-Hyook Lee holds his PhD in Electrical and Computer Engineering. He is a Managing Editor of *International Journal of Information Technology, Communications and Convergence (IJITCC)* and a co-founder of the *International Workshop on Mobility Modeling and Performance Evaluation (MoMoPE)*. He received Excellent Research Awards (two times) from Department of Electrical and Computer Engineering, Sungkyunkwan University. He received Best Paper Award from International Conference on Systems and Networks Communications 2008. He is now developing a solution to make efficient and secure communications for NEMO-based vehicular networks in IMARA Team, INRIA, France. His research interests include mobility management, security, and performance analysis based on protocol operation for next-generation wireless mobile networks.

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During the past couple of decades, information technology has influenced and changed every aspect of our lives and our cultures. Without various information technology applications, it would be difficult to keep information stored securely, to process information efficiently, and to communicate conveniently. It is apparent that information

technology will not only continue playing a very important role in the convergence of computing, communications, and all other aspects of computational science and applications, but also will influence the future's roadmap in areas which include science, engineering, industry, business, law, politics, culture, and medicine. The future impact of information technology in these areas cannot be overestimated.

The *International Journal of Information Technology, Communications and Convergence (IJITCC)* now released by Inderscience aims at being a high-quality peer-reviewed international journal featuring innovative scientific articles covering all aspects of information technology, communications, and convergence. *IJITCC* is guaranteed to bring together the researchers from academia and industry as well as practitioners to share ideas, problems and solutions relating to the multifaceted aspects of information technology, communications, and convergence, and to disseminate the most innovative research and development of all aspects of information technology, communications, and convergence, including their models, services, and novel applications associated with their utilisation. *IJITCC* topics include, but are not limited to: hybrid information technology; digital convergence; multimedia convergence; pervasive/ubiquitous computing and systems; cloud computing; trusted computing and security in convergence; intelligent communications and networks; and bio-inspired computing.

We are honoured to feature seven articles from world scientists for this inaugural issue of *IJITCC*. The first issue starts with an article by Bin Xie, Anup Kumar, David Zhao, Ranga Reddy, and Bing He. The article entitled 'On secure communication in integrated heterogeneous wireless networks', discusses security characteristics unique to heterogeneous wireless networks. How attacks against single or multi-hop wireless networks can be translated into powerful attacks against heterogeneous wireless networks are shown while the authors investigate various types of attacks. This article also provides an overview of existing solutions for security protection and identifies underlying challenges in securing heterogeneous wireless network infrastructures.

The second article entitled 'Multi-path design for 6LoWPAN ad hoc on-demand distance vector routing' by Jian-Ming Chang, Hsin-Yun Yang, Han-Chieh Chao, and Jiann-Liang Chen introduces a multipath 6LoWPAN ad hoc on-demand distance vector routing. The introduced algorithm, which aims to reduce route discovery latency and power consumption, maintains multipaths as alternate routing paths in failure cases of the primary route. The authors present details of the introduced algorithm and provide simulation results to confirm the algorithm's performance.

David Dominguez-Sal, Marta Perez-Casany, and Josep Lluís Larriba-Pey present the performance of a distributed search engine from a data caching point of view using statistical tools on a varied set of configurations in their article. In this third article entitled 'Cooperative cache analysis for distributed search engines', the authors develop two different strategies:

- 1 cache-aware load balancing that issues the queries to nodes that store the computation in cache
- 2 cooperative caching that stores and transfers the available computed contents from one node in the network to others.

Then, the authors show that the combination of both strategies yield better throughput than individually implementing cooperative cache or cache-aware load balancing strategies because of an improvement of the hit rate. Furthermore, their analysis results

confirm that data structures to monitor the system need only moderate precision to achieve optimal throughput.

The article entitled ‘Hierarchical key derivation scheme for group-oriented communication systems’ by Shih-Jeng Wang, Yuh-Ren Tsai, Chien-Chih Shen, and Pin-You Chen addresses cryptography key management issues. The authors introduce a verifiable hierarchical key derivation scheme using the elliptic curve cryptography and the bilinear mapping function which can achieve the same security level but use less bit number compared with RSA. The introduced scheme ensures that only users having higher rank can obtain common keys constructed by the users having lower rank, and then users having higher rank can get the corresponding level key further. Before obtaining the level key, higher level users can obtain a common key of lower level users which is used to encrypt the transmitted data. Thus, users having a higher level can know the transmitted data by decrypting the cipher using the common key they have derived. Obtaining the level key can help the user prove that he is in a specific level.

With the transformations in network management standards, protocols, and principles, new alternative network management techniques are needed rather than simulation techniques. The article entitled ‘Integrated management platform for seamless services provisioning in converged network’ by Natalia Kryvinska, Do van Thanh, and Christine Strauss introduces a concept for applying queuing theory modeling method to converged network management architecture, namely for the call control management. The authors also present a theoretical model for the calibration of running system performance parameters. In particular, this model can be used for what the processing rate should be for a certain arrival rate to obtain certain delay or time spent by a packet in the system. The authors model converged session initiation protocol and intelligent network and then evaluate the steady-state performance measures such as expected waiting time and time in system.

Over the period of time computer games have become a major source of entertainment for humans. Especially, the young generations love to play computer games. In the article entitled ‘Measuring entertainment and automatic generation of entertaining games’ by Zahid Halim, A. Rauf Baig, and Hasan Mujtaba introduces a way to quantify the entertainment value of the human playing computer games. Such quantitative measures help to computer game developers. In the articles, the authors address the issues of measuring entertainment and automatic generation of computer games. Then, some quantitative measures for entertainment in a genre of computer game are provided with a guide for the evolution of new interesting games.

Last but not least, the article entitled ‘A case study – establishing redundant access networks in the telecommunication sector of a developing country’ by Mohammad Ziaur Rahman and Al-Sakib Khan Pathan presents conditions of existing access networks in Bangladesh and provides comparison results on different access networks. The authors also design some possible redundant optical access networks considering some important parameters while some recommendations for sharing existing infrastructures and resources. Because Bangladesh is one of developing countries, the authors’ work in this article would be also useful for other developing countries.

We believe that these seven articles have the good quality and relevance that we expect for developing *IJITCC*. Finally, we would like to thank all authors, reviewers, and members of the editorial board of *IJITCC*.