Editorial: Special Issue on “Security and Multimodality in Pervasive Environments”

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Pervasive computing environments present unique challenges related to specific aspects of security and multimodality (SMPE). In fact, the accessibility of such an environment can be certainly improved using natural interfaces and multimodal interaction systems, which offer users the freedom to select one of multiple modes of interaction with services. They also offer users the opportunity to break through barriers on human–computer interaction making communication intuitive and spontaneous. On the other hand, while extending and facilitating the ways of accessing the environment, security threads arise and the environment must be properly instrumented in order to protect itself from malicious attacks and/or from erroneous actions performed by non-expert users.

We received eighteen manuscripts. After the pre-review process, fourteen manuscripts were selected for the first review. Eight manuscripts were finally selected for this Special Issue after the first, second, and third review processes. Each manuscript selected from the pre-review was blindly reviewed by at least three reviewers consisting of guest editors and external reviewers.

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The first paper in this special issue is on Relation-Based Access Control: An Access Control Model for Context-aware Computing Environment, by Rui Zhang, Fausto Giunchiglia, Bruno Crispo, and Lingyang Song. This paper presents a new model, RelBAC for context-aware environment with a logical framework to describe and maintain the model.

The second paper in this special issue is on Content and Service Protection for the Ubiquitous TV Based on Network Convergence, by Shiguo Lian. This work proposes a secure solution for content protection and user interaction in a ubiquitous TV system, which is composed of business models, content encryption modes, and secure interaction protocols.

The third paper in this special issue is on PIMac: Multicast Access Control Implementation in PIM-SM, by Xin Li, Hongke Zhang, Jian-Ming Chang, and Han-Chieh Chao. They present an access control scheme PIMac for multicast sender and receiver access control in PIM domain, which can provide better access control service than the existing solutions.

The fourth paper in this special issue is on Security Benefit Estimation of Directional Communication, by Xiaofeng Lu, Fletcher Wicker, Pietro Lio, Zhang Xiong, and Don Towsley. They explore the issue of security estimation of directional and omni transmission in Ad hoc networks.

The fifth paper in this special issue is on Enhancing Privacy and Security of RFID System with Serverless Authentication and Search Protocols in Pervasive Environments, by Sheikh I. Ahamed, Md. Endadul Hoque, Farzana Rahman, and Jong Hyuk Park. This work proposes serverless, forward secure and untraceable authentication protocol which ensures that both tag and reader are authenticated at the time of communication and also proposes ownership transfer mechanism which facilitates our protocol to be scalable.

The sixth paper in this special issue is on Robust Deniable Authentication Protocol, by Eun-Jun Yoon, Kee-Young Yoo, Sang-Soo Yeo, and Changhoon Lee. They present an improved deniable authentication protocol based on ElGamal cryptography which providing mutual authentication between the sender and the receiver.

The seventh paper in this special issue is on Authentication and ID-based Key Management Protocol in Pervasive Environment, by Jong-Sik Moon, Jong-Hyuk Park, Deok-Gyu Lee, and Im-Yeong Lee. They propose roaming and AAA (Authentication, Authorization, Accounting) mechanisms in the wired/wireless heterogeneous network environment which provide secure and efficient communication.

The last paper in this special issue is on a Pervasive System for Nuclear Medicine Departments, by Gennaro Della Vecchia and Massimo Esposito. This work presents a pervasive healthcare system which is intended to support clinicians in handling nuclear medicine test sessions within an appropriate, safety-aware context.

Finally, our special thanks go to Prof. Ramjee Prasad (Editor-in-Chief) and the editorial staff for their valuable supports throughout the preparation of this Special Issue. We would like to thank all authors for their contributions to this special issue. We also extend our thanks to the following external reviewers for their excellent job in reviewing the manuscripts.

Author Biographies

Deok Gyu Lee received his Ph.D. degree in the Graduate School of Computer Science from Soonchunhyang University, Korea. He is now a senior member of engineering staff of R&D Institute, ETRI Electronics and Telecommunication Research Institute (ETRI), Korea. Dr. Lee has published many research papers in international journals and conferences. Dr. Lee has served as Chairs, program committee for many international conferences, and workshops; Chair of HPCC'09, SH'09, and PC member of ICOST'09, WISTP'09, UMS'09 and so on. Dr. Lee's research interests include Key Management, signature schemes, Broadcast Encryption, Contents Security, Wireless Security, Ubiquitous Computing, Home Network, etc. He is a member of the IEEE, ACM, KICS, KIISC, KMS, and IEICE.

Sajid Hussain is a Professor in the division of Natural Sciences and Mathematics, Fisk University, USA. He received Ph.D. in Electrical Engineering from the University of Manitoba, Canada. Dr. Hussain is investigating secure and energy efficient communication protocols in sensor networks for mobile, ubiquitous, and pervasive applications. He is interested in smart homes, telehealth, and industry automation. He has published more than 70 refereed journal, conference, and workshop papers. His research is financially supported by several grants and contracts, such as NSERC Canada, NRC Canada, AIF/ACOA, and NSHRF. He has co-organized several journal special issues, conferences, and workshops. He has served on many technical program committees and reviewed papers for several journals. Further, he has reviewed grant proposals for NSERC's Discovery, SPG, and RTI grants. He is a member of IEEE, ACM, IET, SPIE, CIPS, CAIAC, and Sigma Xi societies.

George Roussos holds a BSc in Mathematics from University of Athens, Greece, an MSc in Numerical Analysis and Computing from University of Manchester Institute of Science and Technology, UK, and a Ph.D. from Imperial College of Science Technology and Medicine, University of London, UK. Before joining Birkbeck College as a lecturer he worked as the Research and Development Manager for a multinational information technology corporation in Athens, Greece, where he was responsible for the strategic development of new IT products in the areas of knowledge management and mobile internet; as an Internet security officer for the Ministry of Defence, Athens, where he designed the Hellenic armed forces Internet exchange and domain name systems; and as a research fellow for Imperial College, London, where he conducted research in distributed systems. He is currently investigating the effects of social activity on system architectures, and exploring mechanisms to support navigation and findability. He is a member of the ACM, SIGMOBILE, the IEEE, the IEEE Communications and the IEEE Computer Society.

Yan Zhang received a Ph.D. degree from Nanyang Technological University, Singapore. From August 2006, he is working with Simula Research Laboratory, Norway. He is currently serving the Book Series Editor for the book series on “Wireless Networks and Mobile Communications” (Auerbach Publications, Taylor and Francis Group). He serves as Program Co-Chair for WICON 2010, BROADNETS 2009 and IWCMC 2009, Symposium Co-Chair for ChinaCom 2009 and ChinaCom 2008, Industrial Co-Chair for MobiHoc 2008, Program Co-Chair for UIC-08, Program Vice Co-Chair for IEEE ISM 2007, Publication Chair for IEEE ISWCS 2007. His research interests include resource, mobility, spectrum, and energy management in wireless networks.