

Guest Editors' Introduction

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Privacy, Security and Trust (PST) are increasingly recognized as fundamental and necessary requirements for today's computing systems. Privacy serves to ensure that systems such as e-services respect the user's right to personal information privacy contributing a major part to the systems' usability. Security protects systems from an ever growing number of malicious threats such as virus and man-in-the-middle attacks. Trust brings people and systems together, allowing them to interact more freely and contributing to the success of such important domains as e-business and e-health. Privacy, security, and trust occupy critical roles in the management of information, informatics, and society in general, and have been the fastest developing topics within these areas for the past several years. With the growing impact of the electronic society, privacy, security, and trust are becoming fundamentally important to the conduct of business via the Internet as well as the real-time exchange of data across enterprise borders, across different applications, and across different IT-platforms.

This special issue of the JCS, *Privacy, Security and Trust (PST) Technologies: Evolution and Challenges*, aims to address research demonstrating the evolution and challenges of privacy, security, and trust technologies and their application in all areas of information technology. The objective behind this special issue is to report on state-of-the art evolutionary and challenging developments of PST technologies for e-society, e-business, e-services, Web systems, and the Internet as a whole. This special issue contains extended versions of the best papers from the Fourth Annual Conference on Privacy, Security, and Trust (PST 2006), hosted by the University of Ontario Institute of Technology, Canada. We are pleased to serve as guest editors for this special issue. There are five papers reflecting the breadth of PST topics. Each topic is concerned with a specific aspect of PST technology and is discussed in the following paragraphs.

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Referring to the first paper "Security policy refinement and enforcement for the design of multi-level secure systems", Zhou and Alves-Foss present a policy-based architectural refinement approach for designing multi-level secure systems. They additionally propose a policy refinement language for use in specifying the rules of refinement patterns and present the hierarchy of the patterns. Their goal is to have verified engineering techniques for the design of multi-level secure systems.

Next, the second paper "Privacy policy enforcement in enterprises with identity management solutions" by Mont and Thyne presents an approach to automate the enforcement of privacy policies in enterprises by making use of identity management solutions. The authors propose a model of privacy policy enforcement along with details of a related prototype integrated with a current identity management solution (HP Select Access) as a proof of concept.

In the third paper "Approximate autoregressive modeling for network attack detection", Nayyar and Ghorbani present a method for creating an ARX (AutoRegressive with eXternal input) model of network signals and use it for detecting network anomalies caused by intrusions. The authors claim several advantages of their technique, including that it is online, generic, and can be used with many types of network signals such as bandwidth consumption, rate of flow arrival, and SNMP variables.

Referring to the fourth paper "Privacy in video surveilled spaces", Spindler et al. present a system and prototype for video privacy by integrating computer vision and cryptographic techniques into networked building automation systems. Their system allows people appearing in a video stream to control their visibility on a per-viewer basis by choosing to allow either the real view or a privacy preserving obscured image to be seen. The authors give empirical results using an example of a meeting room scenario.

In the fifth and final paper "Constraint based role based access control in the SECTET framework", Alam et al. describe an approach to overcome some of the challenges of applying Role Based Access Control to the Service Oriented Architecture (SOA). For example, one major challenge is the inheritance of permissions associated with Permission Assignment Constraints (PAC). The authors propose an extension to Role Based Access Control (RBAC), called Constraint Based RBAC (CRBAC), that adapts RBAC to the dynamic environment of SOA.

The papers in this issue illustrate some of the current challenges and research areas pertinent to privacy, security, and trust technologies, while in many ways also amplifying the many issues that remain to be addressed. New topics will emerge, and shifts in order to focus on personal needs, as well as business, organizational, regulatory and policy requirements will no doubt occur. As this happens it becomes increasingly important to understand the issues associated with the inter-play between PST technologies and computing systems, resulting in privacy-respecting, secure, trusted systems that are sound, adaptable and evolvable.

Short bio

George O.M. Yee is a Senior Research Scientist in the Information Security Group, Institute for Information Technology, National Research Council Canada (NRC). Prior to joining the NRC in late 2001, he spent over 20 years at Bell-Northern Research and Nortel Networks. George received his PhD (Electrical Engineering), MSc (Systems and Information Science), and BSc (Mathematics) from Carleton University, Ottawa, Canada, where he is currently an Adjunct Research Professor. George is on the Editorial Review Board of several international journals and is a Senior Member of IEEE, and member of ACM and Professional Engineers Ontario. He was a General co-Chair of the 2007 IEEE International Symposium on Security in Networks and Distributed Systems (SSNDS 2007), and was a member of the organizing committees of the 2006 International Conference on Privacy, Security and Trust (PST 2006) and the 2006 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE 2006). In addition, he has published over fifty papers within the last five years. George's research interests include security and privacy for e-services, security and privacy for business applications, and engineering software for security, reliability, and performance.

Ali A. Ghorbani has held a variety of positions in academia for the past 26 years. Since 1991 he has been at the faculty of Computer Science, University of New Brunswick (UNB), Fredericton, Canada, where he is currently a Professor and Assistant Dean (Research & Outreach). He holds UNB Research Scholar position and is the founding director of Information Security Centre of Excellence (ISCE). He is also a member of the Privacy, Security and Trust (PST) network, University of New Brunswick. Ali received his PhD and Master's in Computer Science from the University of New Brunswick, and the George Washington University, Washington DC, USA, respectively. His current research focus is Neural Networks, Web intelligence, agent systems, complex adaptive systems, and trust and security. Ali established the Intelligent and Adaptive Systems (IAS) and Network Security research groups in 2002 and 2004, respectively, at the faculty of Computer Science, UNB. The IAS group (<http://ias.cs.unb.ca>) pursues research on machine and statistical learning, data mining, intelligent agents and multiagent systems and Web intelligence. The NSL group (<http://nsl.cs.unb.ca>) is home to R&D in computer and network security. He authored more than 130 research papers in journals and conference proceedings and has edited 8 volumes. He is the in-coming co-Editor-in-Chief of the Computational Intelligence (CI), an international journal and Associate Editor of International Journal of Information Technology and Web Engineering. He was Guest Editor for a number of Special Issues, General Chair and Program Chair/co-Chair for 5 International Conferences, and organized over 10 Workshops in conjunctions with International Conferences. Ali is a member of ACM, IEEE, IEEE Computer Society, and CSCSI.

Patrick C.K. Hung is an Assistant Professor at the Faculty of Business and Information Technology in UOIT and an Adjunct Assistant Professor at the Department

of Electrical and Computer Engineering in University of Waterloo. Patrick is currently collaborating with Boeing Phantom Works (Seattle, USA) and Bell Canada on security- and privacy-related research projects, and he has filed two US patent applications on "Mobile Network Dynamic Workflow Exception Handling System". In addition, Patrick is also cooperating on Web services composition research projects with Southeast University in China. He was a Research Scientist with Commonwealth Scientific and Industrial Research Organization (Canberra, Australia) and a Visiting Assistant Professor at the Department of Computer Science in the Hong Kong University of Science and Technology. Patrick has been serving as a panellist of the Small Business Innovation Research and Small Business Technology Transfer programs of the National Science Foundation (NSF) in the States since 2000. He is an executive committee member of the IEEE Computer Society's Technical Steering Committee for Services Computing, a steering member of EDOC "Enterprise Computing", and an associate editor/editorial board member/guest editor in several international journals. He is the Program co-Chair of the 9th IEEE EDOC 2005, the General Chair of the 10th IEEE EDOC 2006 and the Program Committee Vice-Chair of the 2006 IEEE SCC 2006 and 2007. In addition, he also designed and organized the 2006 International Conference on Privacy, Security and Trust (PST 2006) in Canada.