Preface

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Biographical notes: Casey K. Fung is Principal Research Engineer at the Network Centric Operations, Boeing Phantom Works. Prior to this, he was Research Scientist at the Mathematics and Computing Technology of Boeing where he initiated research projects for Quality of Service, Semantic Infosphere, Survivability for Mobile Ad Hoc Network, and Business Process and Service Science. He took leadership roles in DARPA projects, such as Chief Programmer of the program Software for Adaptable and Reliable Systems (STARS). He was on the programme committees of international conferences and workshops such as ICWS, COMPSAC and International Workshop for Business Service Network (BSN). He was Adjunct Professor of Electrical and Computer Engineering at University of Washington, Seattle. He obtained his BS in Electrical Engineering from Ohio University, and his MS and PhD in Computer and Information Science also from the same university.

Patrick C.K. Hung is Assistant Professor at the Faculty of Business and Information Technology in the University of Ontario Institute of Technology (UOIT), Canada. He has worked as Visiting Assistant Professor at the Department of Computer Science in the Hong Kong University of Science and Technology (HKUST) in Hong Kong and as Research Scientist with Commonwealth Scientific and Industrial Research Organization (CSIRO) in Australia. He also has prior industrial experience in e-business projects in the USA, Canada and Hong Kong. He is also an editorial board member of several international journals such as the *International Journal of Web Services Research (JWSR)* and the *International Journal of Business Process Integration Management (IJBPIM)*. He has served as the co-chair of the Ninth International IEEE EDOC Conference (EDOC 2005) '*The Enterprise Computing Conference*'.

When two enterprise systems come to talk with each other, one of the biggest challenges is the issue of interoperability in the context of languages, protocols, and technologies. In the past years, web services technologies have become a more and more promising solution to tackle this challenge. A web service is a software system designed to support interoperable application-to-application interaction over the internet. Web services are based on a set of XML standards, such as Web Services Description Language (WSDL), Simple Object Access Protocol (SOAP) and Universal Description, Discovery and Integration (UDDI). In particular, the Business Process Execution Language for Web Services (BPEL) has recently been proposed for formal specification of business processes and interaction protocols in the context of web services, and has already been implemented in several service-oriented application servers. BPEL defines an interoperable integration model that facilitates automated process integration in intra- and inter-corporate environments. To make business processes run more smoothly, IBM recently proposed an emerging research area called Services Science to industry and academia that is a combination of anthropology, game theory, and behavioural economics with technologies. Services Science also includes culture transformation or integration methods based on beliefs, assumptions, principles and values between two enterprises. Though there is still no well-defined research directions for Services Science, industry and academia are now working on the agenda to build up such as new discipline.

The theme of this special issue is '*Web Services, Business Processes, and Services Science*'. This special issue includes five high-quality papers. In addition, previous versions of the first two papers were presented at the IEEE EEE 05 International Workshop on Business Services Networks (BSN), held in Hong Kong on 29 March 2005 (http://elab.njit.edu/bsn.html). In the first paper 'Composition and evaluation of trustworthy web services', Yang *et al*. present an ontology-based trustworthy evaluation method by using statistical techniques with Petri nets. The method evaluates the degree of trustworthiness in an aggregated composite service by analysing past experiences. Next, in the second paper 'A framework towards web services composition modelling and execution', Adeel Talib and Yang describe an intermediary relational business process model in the context of BPEL. In addition, Adeel Talib and Yang also present algorithms that extract data from the relational model with the notion of control-rules. The results can be enacted in any BPEL complaint orchestration engine.

Referring to the third paper 'Analytical comparisons of switching of web services and switching of service offerings', Tosic *et al*. present an analytical methodology for comparing various SOAP message approaches to dynamic adaptation of web service compositions. Further, Tosic *et al*. also enhance the methodology with switching of service offerings. In the fourth paper 'Compiling business processes: untangling unstructured loops in irreducible flow graphs', Zhao *et al*. present a systematic study of the transformation of business process modelling languages to executable business process representations. Further, Zhao *et al*. also discuss Regular Expression Language (REL) that can compile a business process model that is irreducible with unstructured loops to statements in structured languages with controlled code complexity. Lastly, in the paper 'A mobile agents-based approach to test reliability of web services', Zhang presents a mobile agents-based approach that selects reliable web service components in a cost-effective manner.

In conclusion, the papers of this special issue provide rich evidence of the potential and technical viability of web services, business processes, and Services Science. We would like to thank all authors who submitted and contributed papers to this special issue. In particular, we would also like to thank Andreas Wombacher (University of Twente, The Netherlands), Haifei Li (Union University, USA), Dickson K.W. Chiu (Dickson Computer Systems, Hong Kong), S.C. Cheung and Vivying Cheng (The Hong Kong University of Science and Technology, Hong Kong) for their expertise and support in creating this special issue.