

# Special Issue on Service-Oriented Collaborative Computing and Applications

Jianming Yong, Giancarlo Fortino , Weiming Shen , Yun Yang , Kuo-Ming Chao, and Wil van der Aalst

TODAY'S industries and societies require more advanced technologies to address increasingly complex design issues for products, processes, systems, and services while also meeting the high expectation of customers and sellers. Service-oriented collaborative computing provides technological support to meet these requirements and expectations. This special issue of IEEE Transactions on Services Computing intends to involve researchers and practitioners in different but related fields confront research challenges, issues, as well as research results and solutions in their particular areas of study. The scope of this issue focuses on the research and development of service-oriented collaborative computing technologies and their applications to the design of products, processes, systems and services in an industrial and social viewpoint.

In the first paper "Live Migration for Multiple Correlated Virtual Machines in Cloud-Based Data Centers", Sun et al. propose an efficient virtual datacenter migration algorithm to enhance resource utilizations, and guarantee Quality of Service in cloud datacenters for service-oriented collaborations. The simulation results based on American National Science Foundation network as substrate network are very promising. As the service-oriented collaboration has a significant impact not only on datacentres but also on current e-learning systems, the next paper addresses the research challenges for future learning systems. The second paper is titled "MLaaS: A Cloud-Based System for Delivering Adaptive Micro Learning in Mobile MOOC Learning". Sun et al. propose a dynamic learner model: new educational data mining and learning path optimization techniques are contributed to meet the challenges for massive open online course over the service-oriented cloud environment. A solution of learning path optimization is proposed to assemble a complete MOOC learning experience for better micro

learning outcomes. In the third paper "Knowledge-Based Resource Allocation for Collaborative Simulation Development in a Multi-Tenant Cloud Computing Environment", Peng et al. present a new and improved multi-objective genetic algorithm to optimize the resource allocation over a multi-tenant cloud computing environment for service-oriented collaboration. An improved multi-objective genetic algorithm based on the elitist archive and the K-means approaches is designed to optimize the resource allocation in the service oriented cloud environment. While service-oriented collaborative computing heavily depends on secure communications channels, especially reliable and trust wireless environment, securing the wireless communications channel becomes one of highest priorities. The fourth paper is titled "On Secure Wireless Communications for Service Oriented Computing". Zhang et al. deliver a new approach on wireless security communications over service oriented computing. The simulation and numerical results clearly illustrate the efficiency of the proposed theoretical framework as well as the eavesdropper tolerance capacity of the concerned network obtained by adopting cooperative jamming and opportunistic relaying in service oriented wireless communications. In the fifth paper "Cloud workflow scheduling with Deadlines and Time Slot Availability", Li et al propose an iterated heuristic framework to address the workflow scheduling challenge over service-oriented cloud computing environment. An iterated heuristic framework based initial solution construction-improvement-perturbation is designed to better schedule cloud-based workflow tasks. The sixth paper "Service-Oriented Feature-Based Data Exchange for Cloud-Based Design and Manufacturing" from Wu et al. contribute a cloud-based design and manufacturing model for providing cost-effective, flexible and scalable solutions to collaborative partners by sharing the resources over a collaborative service oriented computing infrastructure. Realizing a service-oriented feature-based data exchange under the peer-to-peer computing model is an innovative approach to creating cloud-based smart manufacturing environments which underpin the strong demand for versatile tools and languages to be used to clearly describe and identify the service itself. In the final paper "Cloud Service Description Model: An Extension of USDL for Cloud Services", Sun et al. propose a unified semantic cloud service description model that extends the basic structure of the Unified Service Description Language (USDL) to provide a new, better way to describe Internet services for all the individuals and businesses that consume the services in a service oriented cloud

- J. Yong is with the University of Southern Queensland, Australia. E-mail: yongj@usq.edu.au.
- G. Fortino is with the University of Calabria, Italy. E-mail: giancarlo.fortino@unical.it.
- W. Shen is with the National Research Council Canada. E-mail: Weiming.Shen@nrc-cnrc.gc.ca.
- Y. Yang is with the Swinburne University of Technology, Melbourne, Australia. E-mail: yyang@swin.edu.au.
- K.-M. Chao is with the Coventry University, UK. E-mail: csx240@coventry.ac.uk.
- W. van der Aalst is with the Technische Universiteit Eindhoven, Netherlands. E-mail: W.M.P.v.d.Aalst@tue.nl.

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computing environment. The case study in the paper clearly demonstrates the advantage of the proposed unified semantic cloud service description model. In short, the seven papers forge this special issue on service-oriented collaborative computing and applications from different perspectives of current cloud and service infrastructure.

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*Guest Editors*

Jianming Yong  
Giancarlo Fortino  
Weiming Shen  
Yun Yang  
Kuo-Ming Chao  
Wil van der Aalst



**Jianming Yong** is an associate professor at the School of Management and enterprise, University of Southern Queensland, Australian. He received the PhD in 2004 from Swinburne University of Technology, Melbourne, Australia. His current research includes information security, cloud computing and service oriented cooperation. He is the secretary of the international steering committee of Computer Supported Cooperative Work in Design.



**Giancarlo Fortino** (SM '12) received his Laurea (B.S. and M.S.) degree in Computer Engineering from University of Calabria (UniCal), Italy in 1995, and Ph.D. degree in Computer Engineering from University of Calabria, Italy in 2000. He is currently (Habilitation Full) Professor of Computer Engineering at the Dept. of Informatics, Modeling, Electronics and Systems (DIMES) of UniCal and Adjunct Professor at Wuhan University of Technology (China). He is in the editorial board of four IEEE journals/transactions. He is also co-founder and CEO of SenSysCal S.r.l., a spin-off of UniCal focused on Internet of Things technology.



**Weiming Shen** received his Bachelor and Masters degrees from Northern (Beijing) Jiaotong University, China (in 1983 and 1986 respectively) and his PhD degree from the University of Technology of Compiègne, France (in 1996). He is currently a Senior Research Scientist at the National Research Council Canada, an Adjunct Professor at the University of Western Ontario, Canada. His research interest includes intelligent software agents, service-oriented computing, wireless sensor networks, IoT, and Big Data. He is a Fellow of IEEE, a Fellow of the Engineering Institute of Canada, and a licensed Professional Engineer in Ontario, Canada.



**Yun Yang** received the PhD degree from the University of Queensland, Australia, in 1992, in computer science. He is currently a full professor in School of Software and Electrical Engineering at Swinburne University of Technology, Melbourne, Australia. He is currently on the Editorial Board of IEEE Transactions on Cloud Computing. His current research interests include software technologies, cloud computing, p2p/grid/cloud workflow systems, and service-oriented computing. He is a senior member of the IEEE.



**Kuo-Ming Chao** obtained his MSc and PhD degrees from Sunderland University, UK in 1993 and 1997 respectively. His research interests include the areas of service-oriented computing, intelligent agents, cloud computing and big data etc. He is a member of editorial board for a number of international journals. In addition he is involved a number of EU-funded projects as coordinator or work pack leader. He serves a number of international conferences by taking different responsibilities such as general chair for 10th IEEE ICEBE, 2010 IEEE conference CEC, programme chair for 9th ICEBE, 2009 CEC and 2005 CSCWD, Track Chair for 2010-2012 AINA and others.



**Wil van der Aalst** is a full professor at the Department of Mathematics & Computer Science of the Technische Universiteit Eindhoven (TU/e) where he chairs the Architecture of Information Systems (AIS) group (from 2000-2006 he also chaired the IS capacity group at TU/e). He also has a part-time appointment in the BPM group of Queensland University of Technology (QUT). His research and teaching interests include business process management, information systems, workflow management, Petri nets, process mining, specification languages, and simulation. He is an Associate Editor of IEEE TSC.