
Preface

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Biographical notes: Fatos Xhafa received his PhD in Computer Science in 1998 from the Department of Computer Science of the Technical University of Catalonia (UPC), Spain. Currently, he holds a permanent position of Professor Titular (Hab. Full Professor) at UPC. He was a Visiting Professor at University of London, UK, 2009–2010 and Research Associate at Drexel University, USA, 2004–2005. He has published in international journals, conferences/workshops, chapters, books and proceedings. He is editor in Chief of *IJGUC* and *IJSSC*, Inderscience and of the Elsevier Book Series *Intelligent Data-Centric Systems* and *Lecture Notes in Data Engineering and Communication Systems* by Springer Verlag. His research interests include parallel and distributed algorithms, massive data processing and collective intelligence, optimisation, networking, P2P, cloud computing, security and trustworthy computing, among others.

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IoT and cloud computing are among the most important large-scale distributed computing paradigms, which are having enormous impact to all application fields. However, while IoT distinguishes for putting together low computing capacity devices at the edges of the internet, the cloud computing leverages large scale computing capacities through virtualisation of resources. The integration of IoT and cloud is at present among most important research and development trend, which poses many challenges from algorithmic theory, communication protocols and efficient and scalable practical applications.

The aim of this special issue is to present recent research findings, innovative researches, and technologies as well as developments related to IoT, cloud computing and to their integration. The special issue comprises five papers, arranged as follows.

In the first paper, Enokido et al. present an electric power consumption model and a computational model for a cluster of servers, aiming to reduce the energy consumption. Based on the proposed models the authors develop an improved delay time based algorithm to reduce the total electric energy consumption of a cluster and to more efficiently utilise the computation resources for performing application processes in a cluster. The findings of the paper are argued by experimental evaluations.

The second paper by Lim et al. proposes a security-based context aware smart grid system based on energy usage data aggregation module and context awareness. Their proposal can support intelligent decision-making and hence efficient smart grid system management based on Knowledge Machine (KM). The proposed smartgrid system can provide robust and secure services which defend the system against various outside attacks.

Cui and Yan in the third paper review the state of the art of vehicle-to-vehicle communications and analyse some research issues and challenges. Given the vital role of communications protocols in vehicular networks, the authors present a comprehensive overview of data management in order to explore the present research status with its main problems in vehicular communication. The authors describe the protocol of vehicular networks and the various types of data managed in that environment, also analyse the challenges faced.

In the fourth paper, Yang et al. focus on the security of the Low Level Reader Protocol (LLRP) released by EPCglobal and designs an enhanced secure mechanism for LLRP that consists of the handshake protocol of the authentication and session key update protocols. The encryption is applied to the communication of the entire LLRP protocol; therefore, the session key should be regularly updated. Because the requirements for session key update are different under different scenarios, a two-round key update protocol and a four-round key update protocol are designed to ensure the security of the protocol. The paper concludes with a performance evaluation of the mechanism.

Finally, in the fifth paper, Oda et al. address the opportunities provided by the internet to develop advanced e-learning courses. The authors analyse the problem of completion rate, which is low in these systems. The authors design and implement an IoT-based e-learning testbed using Raspberry Pi mounted on Raspbian. The performance of Optimised Link State Routing (OLSR) and Wired Equivalent Privacy (WEP) protocols in an indoor scenario are analysed and conclusions are drawn.

As guest editors of this special issue, we would like to thank all the authors for submitting their papers and the reviewers for their constructive feedback to authors to make it possible to publish this special issue. We would like to thank the Editor-in-Chief of *IJWGS* journal Prof. David Taniar for giving us the opportunity to edit the special issue. The support from the journal manager is highly appreciated.