Introduction

Mohamed Ghazel*

IFSTTAR – COSYS/ESTAS,
20 rue Élisée Reclus, 59666 Villeneuve d'Ascq cedex, France
Email: mohamed.ghazel@ifsttar.fr
*Corresponding author

Mohamed Jmaiel

Digital Research Center Sfax (CRNS),
B.P. 275, Sakiet Ezzit, 3021 Sfax, Tunisia
Email: mohamed.jmaiel@enis.rnu.tn

Biographical notes: Mohamed Ghazel is a Research Director and Deputy Director of COSYS/ESTAS Laboratory at The French Institute of Science and Technology for Transport, Development and Networks (IFSTTAR). He received his Master's and PhD in Automatic Control and Industrial Computer Sciences from the École Centrale de Lille/University of Lille in 2002 and 2005, respectively, and Habilitation à Diriger des Recherches (HDR) from the University Lille Nord de France in 2014. His research mainly focuses on safety and interoperability of guided transportation systems using discrete models and formal methods. He is a member of the IFAC TC 7.4 on Transportation Systems. He was the Program co-Chair of Conference on Verification and Evaluation of Computer and Communication Systems (VECoS 2016) and served on PCs for numerous international workshops and conferences. He has been involved in several national and European research projects and acts as expert for the European Commission in the framework of innovation programs.

Mohamed Jmaiel obtained his PhD from the Technical University of Berlin in 1996. He became a Full Professor at the University of Sfax in January 2009. His current research areas include software engineering of distributed systems, formal methods, and autonomic middleware. He conducted many research projects and published more than 220 regular and invited papers in international conferences and journals, and co-edited six conferences proceedings and five journals special issues on these subjects. He was the Director of the National Engineering School of Sfax (ENIS), from 2011 to 2014. He is currently the Director of the Digital Research Center of Sfax.

This issue is devoted to extended versions of selected contributions dealing with 'Model checking & fault tolerance' accepted and presented in editions of International Conference on Verification and Evaluation of Computer and Communication Systems (VECoS) held in 2015 in Bucharest and 2016 in Tunis.

VECoS was created by a Euro-Med network of researchers in computer science. The aim of the VECoS conference is to bring together researchers and practitioners, in the areas of verification, control, performance, quality of service (QoS), dependability evaluation, in order to discuss the state-of-the-art and the challenges in modern computer and communication systems in which functional and extra-functional properties are

strongly interrelated. Thus, the main motivation for VECoS is to encourage the cross-fertilisation between the various formal verification and evaluation approaches, methods and techniques, and especially those developed for concurrent and distributed hardware/software systems. Beyond its technical and scientific goals, another main purpose of VECoS is to promote collaboration between participants in research and education in the area of computer science and engineering. We welcome contributions describing original research, practical experience reports and tool descriptions/demonstrations in the areas of verification, control, performance, QoS and dependability evaluation.

The program committees included researchers from 15 countries and more than 40 laboratories. Each of the 45 submitted papers was evaluated by at least three reviewers. Afterwards, reports returned to the program committee for discussion and resolution of conflicts. Based on their recommendations, we selected 21 papers. The proceedings including these accepted papers were published by the CEUR-WS.org. After that, we invited 17 authors to submit extended versions of their papers. After additional refereeing and further revisions, we were able to accept ten papers for inclusion in this special issue. Part 2 'Performance evaluation & test' comprises the following papers:

- 'Performance analysis of the $M/G/c/c + r$ queuing system for cloud computing data centres'

  Assia Outamazirt, Mohamed Escheikh, Djamil Aïssani, Kamel Barkaoui and Ouiza Lekadir propose $M/G/c/c + r$ queue for analytical modelling of cloud centres. Moreover, they provide more accurate approximate formulas to compute the transition-probability matrix of this queuing system in order to investigate the performances of cloud server farms.

- 'Multicore scheduling of real-time systems subject to permanent failure of one core with detection delay'

  Yves Mouafo Tchinda, Annie Choquet-Geniet and Gaëlle Largeteau-Skapin propose three techniques to schedule multicore real-time systems with a pfair algorithm while meeting task deadlines despite the failure of one core detected several time units after its occurrence. The techniques are based on the use of spare cores and scheduling strategies to recover the lost execution in a bounded delay.

- 'A model-based approach to combine conformance and load tests: an eHealth case study'

  Moez Krichen, Afef Jmal Maâlej and Mariam Lahami propose a new model-based framework that combines both conformance and load tests in the context of real-time systems using the model of extended timed automata with inputs/outputs and shared integer variables and report on a case study from the healthcare field.

- 'Formal probabilistic performance verification of randomly-scheduled wireless sensor networks'

  Maissa Elleuch, Osman Hasan, Sofiène Tahar and Mohamed Abid provide a theorem proving-based accurate formal analysis of the network lifetime for randomly-scheduled wireless sensor networks (WSN). In particular, they develop higher-order-logic formalisations of the lifetime maximisation problem under QoS constraints.

- 'Performance evaluation of stochastic real-time systems with the SBIP framework'

  Ayoub Nouri, Braham Lotfi Mediouni, Marius Bozga, Jacques Combaz, Saddek Bensalem and Axel Legay propose a new framework, named SBIP that combines a stochastic real-time modelling formalism and a statistical model-checking verification engine. The new formalism reconciles the stochastic and the real-time BIP semantics and generalises them. SBIP was used for the modelling and analysis of several case studies covering multimedia application and communication protocols.

We are grateful to all the members of the program, organising committees and referees of the proceedings of this special issue for their hard work. The support and encouragement of the steering committee were invaluable assets. Finally, we would like to thank all the authors of the invited and submitted papers and all the participants of these editions.