Editorial

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Biographical notes: Kamel Barkaoui received his PhD in Computer Science from the Université Pierre et Marie Curie (UPMC) in 1988. He is currently a Professor at the Conservatoire National des Arts et Métiers (CNAM). His research interests include verification and performance evaluation of concurrent and distributed systems. He received the Outstanding Paper Award of 1995 IEEE Int. Conf. on System Man and Cybernetics. He served on PCs and as PC chair for numerous international workshops and conferences. He was a Guest Editor of the *Journal of Systems and Software* (JSS) and *Formal Aspects of Computing* (FACJ). He is also the Steering Committee Chair of the International Workshop on Verification and Evaluation of Computer and Communication Systems (VECoS).

Bruno Monsuez graduated in 1989 from Ecole Polytechnique and received his PhD in Computer Science from the Ecole Polytechnique in 1994. He is currently the Director of the Electronics and Computer Engineering Department at ENSTA ParisTech. His current research interests are focused on developing and enhancing hierarchical compositional mathematical models that can be used to represent hardware and software components of complex embedded systems as well as formal verification techniques that allow a co-jointly verification the functional and non-functional properties of the software as well as the hardware on which the software is expected to run. He served on PCs and as PC Chair for numerous international workshops and conferences. He is the Steering Committee Co-chair of the International Workshop on Verification and Evaluation of Computer and Communication Systems (VECoS).

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This issue is devoted to extended versions of selected contributions from the technical sessions of the last four editions of International Workshop on Verification and Evaluation of Computer and Communication Systems (VECoS) held in 2007 in Algiers, 2008 in Leeds, 2009 in Rabat, and 2010 in Paris.

VECoS was created in 2006 by a euro-maghrebian network of researchers in computer science. The aim of this workshop is to bring together researchers and practitioners to present their results, exchange experience, ideas, and solutions for their problems in the areas of verification, control, performance and dependability evaluation; to discuss the state of the art for solving the challenges facing us today in various modern computer and communication systems where functional and extra functional properties are strongly interrelated and thirdly to encourage the cross-fertilisation between formal verification and evaluation approaches, methods and techniques especially those based on the specification formalisms for concurrent and distributed soft/hard systems.

Beyond its technical and scientific goals, another main purpose of VECoS is to promote collaboration in research and education between participants and their institutions, from developing and industrial countries in the area of computer science and engineering.

The programme committees included researchers from 15 countries and more than 40 laboratories. Each of the 122 submitted papers was evaluated by at least three reviewers. Afterwards, reports were returned to the programme committee for discussion and resolution of conflicts. Based on their recommendations, we selected 49 papers. The proceedings including these accepted papers were published by the eWiC series of the British Computer Society. After VECoS'2010, we invited 19 authors to submit extended versions of their papers. After additional refereeing and further revisions, we were able to accept 14 papers for inclusion in this special issue. Part 1 comprises the following papers:

- 'Improving the consistency verification and the quality of multimedia presentations'

  Abdelkrim Abdelli presents a formal methodology based on a time Petri net improving the temporal consistency verification of multimedia presentations. In addition the proposed approach makes possible over inconsistencies checking due to output-resource conflicts.

- 'An approach for the synthesis of decentralised supervisors for distributed adaptive systems'

  Amine Belhaj Seboui, Nejib Ben Hadj-Alouane, Gwenael Delaval, Eric Rutten and Moez Yeddes present an approach for the synthesis of decentralised supervisors for distributed adaptive systems by considering an automated computing of models for each remote subsystem. These models are used to compensate for the lack of information caused by the distributed nature of the system, in order to synthesise a controller in each site.

- ‘Real-time scheduling using regularity criteria and a geometrical approach’

  Annie Choquet-Geniet and Gaëlle Largeteau-Skapin present a geometrical characterisation of PFair model as well as how to build a geometric PFair model. This geometrical characterisation allows comparison between (partially) PFair schedules and selection among different possible schedules the most PFair one.

- ‘A tile logic-based semantics for mobile software architectures’

  Chafia Bouanaka, Faiza Belala and Kamel Barkaoui present an interface-centred model for formally specifying mobility in complex software systems. Additionally to the usual incremental construction of system structure, the tile logic-based semantics of this model permits to deal with mutual side effects perception of components reconfiguration due to sub-components mobility.

- ‘Steady state property verification of very large systems’

  Diana El Rabih, Gaël Gorgo, Nihal Pekergin and Jean-Marc Vincent provide an experimental comparison study between the statistical model checking using perfect sampling, the numerical method implemented in model checker PRISM and the statistical model checking implemented in model checker MRMC for the verification of CSL steady state properties.

- ‘Specification and verification of real-time systems using POLA’

  Florent Peres, Pierre-Emmanuel Hladik and François Vernadat present a tool that automatically transforms a specification of real-time systems expressed in a domain specific language (POLA) into its corresponding timed Petri net semantics as well as generates a set of logical formulas related to the system. Using a model checker, this approach allows to check validity of the generated logical formulae as well as additional formulae that can be expressed in a temporal logic.

- ‘OS-level hang detection in complex software systems’

  Antonio Bovenzi, Marcello Cinque, Domenico Cotroneo, Roberto Natella and Gabriella Carrozza present a detection framework copying with software hangs in complex systems. The framework allows non-intrusive monitoring based on multiple sources of data gathered at operating system level that can be analysed to detect any anomaly. The results of the experiments show that the combination of several monitors is effective in detecting hang failures with negligible impact on performance.

- ‘Functional term rewriting systems towards symbolic model-checking’

  Yohan Boichut, Jean-Michel Couvreur and Duy T. Nguyen present the theoretical foundations of a new formal tool for the symbolic verification of finite systems. In this approach, states are encoded by terms in a BDD-like manner and the transition relation is represented by a new rewriting relation so called functional term rewriting systems (FTRSs). The authors show that FTRSs are as expressive as traditional term rewriting systems and present an implementation of FTRS-based tool as well as optimisations based on local fixpoint computations. Finally, some experiments show that this implementation can outperform other rewriting tools such as Timbuk, Maude or Tom.

We are grateful to all members of the programme and organising committees and to all referees of the proceedings and 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 the workshop.