Guest Editorial—RTNS 2014

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This issue of the journal Real-Time Systems contains the extended versions of three among the best papers presented at the 22nd International Conference on Real-Time Networks and Systems (RTNS-2014), which was held in Versailles on October 8–10, 2014. The scope of the conference covered all aspects of real-time systems and networks. A selection of the papers presented at the conference were invited to submit extended versions for this special issue. These papers were selected based on their quality, relevance and originality.

- The paper entitled “*Response Time Analysis for Fixed-Priority Real-Time Systems with Energy-Harvesting*” is written by Yasmina Abdeddaïm, Younès Chandarli, Robert I. Davis and Damien Masson. It introduces sufficient schedulability tests for fixed-priority pre-emptive scheduling of a real-time system under energy constraints. In this problem, energy is harvested from the ambient environment and used to replenish a storage unit or battery. The authors derive sufficient schedulability tests based on the computation of worst-case response time upper and lower bounds. They show that these tests are sustainable with respect to decreases in the energy consumption of tasks, and increases in the storage unit replenishment rate.
- The paper entitled “*Combined Task- and Network-level Scheduling for Distributed Time-Triggered Systems*” is written by Silviu S. Craciunas and Ramon Serna Oliver. The work concerns safety-critical and real-time distributed applications in domains where determinism is a key requirement, like the aerospace, automotive,

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and industrial domains. The research considers Ethernet-based time-triggered networks and real-time tasks. The authors propose a simultaneous co-generation of static network and task schedules for distributed systems consisting of preemptive time-triggered tasks which communicate over switched multi-speed time-triggered networks. The authors demonstrate the performance of the approach with an extensive evaluation of industrial-sized synthetic configurations.

- The paper entitled “*Cache Related Pre-emption Delays in Hierarchical Scheduling*” is written by Will Lunniss, Sebastian Altmeyer, Giuseppe Lipari and Robert I. Davis. It studies hierarchical scheduling which provides a means of composing multiple real-time applications onto a single processor. The research addresses the performance enhancing features such as caches which may violate the requirement of temporal isolation. The authors present an analysis to bound the additional delay due to blocks being evicted from cache by other applications in a system with hierarchical scheduling when using either a local FP or EDF scheduler.

We would like to thank the authors that contributed to this special issue for the quality of their work and their collaboration and the reviewers for the quality of their evaluations.