Guest Editorial: Special Issue on The Real-Time Systems Symposium

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The continuous evolution of technology has an increasing impact in all aspects of human society from personal relations through transport, logistics, communications, information systems and manufacturing. In many cases this evolution comes from embedded computing becoming ubiquitous and converting many devices and systems into cyberphysical systems: from simple devices such as watches or toasters to complex systems such as aircraft or autonomous vehicles. Embedded computers are integral parts of these systems that have to keep up with the temporal dynamics of their physical environment. As a consequence, many of them have real-time requirements.

The Real-Time Systems Symposium (RTSS) is the premier world conference in the area of real-time theory and practice and includes related topics such as cyberphysical systems, wireless sensor networks and design and verification. In 2013 RTSS was celebrated in beautiful Vancouver, Canada, and reached its 34th edition, presenting a very interesting program that included excellent scientific papers carefully selected by the program committee, a work in progress session, five satellite workshops and an open demo session. A selection of the best papers presented at the conference was made, and their authors were invited to submit extended journal versions of their papers to this special issue of the Real-Time Systems Journal. These journal papers were reviewed according to the rigorous standards of the Real-Time Systems Journal.

Scheduling the processes being executed in a real-time system and determining whether or not they can meet their timing requirements are at the heart of being able to guarantee a correct temporal response. Consequently, scheduling theory is one of the fundamental parts in the study of real-time systems. Many scheduling algorithms

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have been proposed and studied in the literature but one of the simplest and oldest, static priority scheduling, is still a research topic. The first paper in this special issue, by Martin Stigge and Wang Yi studies feasibility analysis of static priority systems by trying to reduce its complexity.

Hardware platforms are rapidly evolving from single processors to multicores that pose important challenges to the analysis of real-time properties, due to the interactions between the processes simultaneously being executed in the different cores. The second paper in this special issue, by Meng Xu, Linh Thi Xuan Phan, Oleg Sokolsky, Sisu Xi, Chenyang Lu, Christopher Gill and Insup Lee, studies the cache-related interactions in multicore platforms used for virtualization.

The third paper, by Dong Wang, Tarek Abdelzaher, Lance Kaplan, Raghu Ganti, Shaohan Hu and Hengchang Liu, is devoted to the problem of analyzing the reliability of the input to a cyberphysical system by using a novel approach based on the recent but extensive availability of information in social networks.

In summary, this special issue offers a small crosscut of current research trends in real-time and cyberphysical systems, with subjects ranging from scheduling theory, to multicore platforms and techniques based on social networks.