13th International Workshop on Discrete Event Systems (WODES 2016)

Special Session on

Discrete Control for Adaptive and Reconfigurable Computing Systems

Xi'an, China, 30 May - 1 June 2016

Brief Description of Special Session:

Recently in Computer Science, the notion of self-adaptive or autonomic computing systems has been introduced and defined as computing systems that can reconfigure themselves through feedback loops.

Motivations for dynamic adaptivity are important issues like : resource management e.g., computation, memory, communication bandwidth, energy, integrated circuit surface, time ; quality of service e.g., levels of precision in computing, of urgency of treatment, graceful degradation ; dependability and fault tolerance, e.g., controlling migrations in response to loss of a processor.

Adaptation concerns computing systems ranging from hardware to operating systems to services and applications, and in size from tiny embedded systems to large-scale data-centers, from multi-core processors to the Cloud. Their complexity is growing, in scale (software of hardware), but also in interactions between different aspects of reconfiguration. Furthermore, these systems are increasingly complex and autonomous: their management cannot anymore rely on human administrators. The correct design and implementation of automated control of the reconfigurations and their tuning is recognized as a key issue for the effectiveness of these self-adaptive computing systems. Therefore, there is a need for well-founded methods, models and techniques for the design of controllers which can give guarantees on the behavior of the controlled systems.

Currently, the design of the adaptation controllers is largely done in an ad-hoc fashion, but there is a growing interest in using Control Theory for their design, in order to provide designers with a support to master the complexity of designs, and with guarantees w.r.t. their correctness or optimality. Such feedback loops can be designed using continuous control techniques when they concern quantitative aspects. Another significant approach addresses synchronization and coordination problems using discrete control techniques.

The purpose of this special session is to group contributions about the model-based

control of self-adaptive and reconfigurable computing systems, especially involving models and algorithms related to Discrete Event Systems. On the one hand it will introduce this interesting new application domain, with very novel and original potential for DES and control. On the other hand, it will highlight the needs coming particularly from this application domain, e.g. modularity and adaptive discrete control.

Organizer:

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Contributions

Please contact **Eric Rutten** (Email: Eric.Rutten@inria.fr) or **Hervé Marchand** (Email: herve.marchand@inria.fr) as soon as possible if you would like to contribute a paper to this Special Session. Please include in your e-mail: names, affiliations, contact addresses of the contributing authors; and a tentative title of your paper. Special sessions papers will follow the reviewing process of regular papers (see http://wodes2016.diee.unica.it/callforpaper.html).