Special Issue on Multicore Systems

Guest Editors:

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Scope:
The exponential increase in the transistor count predicted by Moore’s law led to the development of processing devices with billions of transistors. However, technological problems due to the reduction of transistor sizes have limited the frequency scaling of single-core processor devices to a few GHz. In order to exploit the vast computing power offered by recent manufacturing processes, chips vendors are integrating more cores running at reduced frequencies, allowing higher performance while keeping power and heating problems under control. This trend is common to both the high-end and embedded computing markets, introducing fundamental new challenges to software and operating systems developers.

The real-time community is facing the same challenge, designing new scheduling approaches and schedulability tests for applications running on multi-core systems. Tools and algorithms are developed in order to bound the multiple factors that affect the task response times, like memory and bus contention, task interference, synchronization, communication, scheduling and system overhead. New task models are explored to match the expressiveness of widely used parallel programming models. Efficient shared resource protocols are designed to deal with the extensive sharing of hardware and software resources peculiar of multi-core systems. This special issue is directed at research that addresses such challenges.

The scope of this special issue includes topics related to the design and analysis of multicore real-time systems. Such topics include, but are not limited to:

- scheduling and schedulability analysis;
- co-scheduling of hardware resources;
- parallel task models and related analysis;
- hardware-software co-design;
- synchronization and shared resource protocols;
- power and thermal management;
- timing analysis;
- operating systems;
- middleware;
- programming languages;
- and application studies.

Important Dates:
Submission deadline: September 1st, 2014