Journal of Electrical and Computer Engineering

Special Issue on

Application-Driven Design of Parallel Embedded Systems

CALL FOR PAPERS

Nowadays, the design of high performance embedded systems at a low power budget becomes a challenge for computer architects and application engineers. Parallel processing, very often exploiting heterogeneous computing platforms, has proven to be a very good solution to enable successful execution of computational intensive algorithms under tight (hard) real-time constraints. Technologies combining different types of processing cores (e.g., ASIPs, GPUs) and accelerators (e.g., FPGA fabrics) represent very powerful and flexible solutions, prospectively allowing a very effective allocation of computation resources.

However, several challenges still have to be addressed:

- Firstly, systems must be carefully tailored and optimized according to the needs of the target application to meet the requested performance and, at the same time, tight power, energy, and cost budgets.
- Secondly, to effectively take profit from parallel computing, the power/energy dissipation of the system has to be carefully managed, dynamically adapting it to variable workloads and/or power/energy budgets.
- Moreover, parallel programming for heterogeneous multicore systems still requires a lot of work at the mapping level for the identification of optimal constraints-aware tasks assignment.

This special issue aims at publishing papers presenting novel methodologies or IPs, acting at all levels of the design (including application software, middleware/run-time environment, hardware architecture, and development and prototyping/evaluation tools), improving design effectiveness with respect to the previously mentioned challenges, or use-cases reporting their management in relevant application domains.

Potential topics include, but are not limited to:

- Energy-efficient systems
  - Dynamic voltage frequency scaling, dynamic power management
- Design methodologies
  - Early stage design space exploration
  - Power estimations and power minimization methodologies
- Use-Cases
  - Embedded multimedia, image, and signal processing
  - Customized low power devices

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