

## CALL FOR PAPERS



IEEE Transactions on Industrial Informatics



Special Section/Issue on:

### “Software Synthesis and Execution Platform Mapping for Embedded Systems”

#### Special Section/Issue Guest Editors

Peter Marwedel  
TU Dortmund  
Informatik 12  
Dortmund, Germany  
phone: +49 231 7556111  
fax: +49 231 7556116  
peter.marwedel@tu-dortmund.de

Soonhoi Ha  
Seoul National University  
Seoul, South Korea Phone:  
+82 10 22238382  
Fax: +82 2 8791532  
sha@snu.ac.kr

Grant Martin  
Tensilica Inc.  
Santa Clara, US  
Phone: +1-408-327-7323  
Fax: +1-408-986-8919  
gmartin@tensilica.com

Alberto Sangiovanni-Vincentelli  
UC Berkeley, Berkeley, US;  
ALES, Rome, I  
alberto@eecs.berkeley.edu

**Background:** According to many forecasts, the integration of information technology (IT) and the physical environment will be the next revolution in IT. This integration has many facets, from implementation issues related to the design of embedded systems to theoretical ones that are encompassed under the name of cyber-physical systems. The integration into a physical environment changes the requirements for the design of IT systems. Resources like space, time and energy are critical as opposed to business applications such as office automation. The design of the software involved in these hybrid systems poses significant challenges due to required levels of dependability, energy efficiency, timing predictability, and resource efficiency in general. Due to these challenges, novel software generation techniques are essential. Automatic or semi-automatic software generation techniques from models have the potential of replacing error-prone manual software authoring, yielding a more predictable software quality. Further, verification of automatically-generated software, if needed at all, is much easier than the verification of manually generated software. To evaluate the non functional properties listed above, generated software should be mapped to target platforms so that constraints on the behavior of the system are satisfied. This means that, for example, energy consumption and worst case execution times (WCETs) must be considered. There may also be tight code-size constraints due to limits on memory size often caused by the need of developing inexpensive solutions typical of embedded systems. Given recent trends in microcomputer architecture, multi-processor platforms must be supported. Techniques for mapping applications to (either homogeneous or heterogeneous) multi-processor platforms are required. These techniques need to consider multiple models of computation as well as multiple objectives. –

The Special Section “Software Synthesis and Execution Platform Mapping for Embedded Systems” aims at presenting some of the most significant research works representing the state-of-the-art in scientific foundations and technologies that address issues in software generation for embedded and cyber-physical systems.

Topics include, but are not limited to, the following aspects of software synthesis and code generation :

- Code generation in model-based embedded system design
- Mapping of applications to MPSoCs and embedded multi-cores
- Source-to-source pre-pass tools
- Compilers for embedded processors
- Code optimization techniques for objectives in embedded system design (e.g. power, WCET)
- Application-domain-specific code optimization techniques.

Submissions to this Special Section must represent original material that has not been neither submitted to, nor published in, any other journal. Extended versions of papers previously published in conference proceedings, digests or preprints may be eligible for consideration, provided that the authors inform the Special Section Guest Editors at the time of submission.

**Manuscript preparation and submission:** Follow the guidelines in “Information for Authors” in <http://iee-ies.org/tii/>

Submit using Manuscript Central only  
<http://mc.manuscriptcentral.com/tii>

Paper submission deadline: July 30th, 2010

Expected publication date: August 2011 (tentative)

Note: The recommended papers for the section are subject to final approval by the Editor in Chief. Some papers may be published outside the special section, at her/his discretion.