



CALL FOR PAPERS

IEEE Transactions on CAD Special Section on Automotive Embedded Systems and Software

IEEE Transaction on Computer Aided Design (TCAD) seeks original manuscripts for a Special Section on **Automotive Embedded Systems and Software**.

Modern cars are currently undergoing a tremendous amount of innovation in their electronics and software. A high-end car currently has 50 – 100 electronic control units (ECUs), each with one or more – possibly multi-core – processors. These ECUs communicate using different communication buses such as CAN, FlexRay, LIN and now also Ethernet. Such architectures are used to run several millions of lines of software code spanning over safety-critical, driver assistance, comfort, and entertainment related applications. Hence, today a car is a large distributed system whose design is subject to several constraints such as safety, security and time-to-market, and combines applications with different levels of criticality. Further, unlike avionics, the automotive domain is highly cost sensitive, which makes both design and especially verification considerably harder. In addition, this domain is constantly evolving – certification is increasingly becoming important, autonomous cars and advanced driver assistance systems are becoming more mature, full electric vehicles and electromobility are quickly moving from research to reality.

Nevertheless, this domain still faces a large number of technical challenges in the area of electronics and software – handling the complexity of large distributed architectures, possibilities of plug-and-play, integrating software applications with multiple criticality levels onto fewer ECUs, verification/certification, issues related to safety and security, efficient model-based design, standardization issues to enable component-based development and easy integration of components from multiple suppliers, certification of autonomous vehicles, and issues related to electric vehicles.

The goal of this special section is to highlight some of these challenges and potential solutions and spur new research efforts on automotive systems within the embedded systems and design automation communities. Topics of interest include, but are not limited to:

- Automotive E/E architecture design methods and tools
- Model-based systems, software engineering and verification
- Automotive Control Systems Design
- Virtualization in the automotive domain
- Multicore challenges
- PLM solutions for development, update and sale of automotive software and apps
- Assessment and detection of automotive security threats and vulnerabilities
- Designing architecture and software for security
- Safety and reliability requirements and their verification
- Efficient deployment of AUTOSAR and automotive standards
- HMI, infotainment development and usability testing
- Development methods for advanced driver assistance systems
- Design methods and tool-chains for autonomous vehicles and active safety
- Architectural design and optimization for EVs and HEVs
- Electric and hybrid drive train and Power electronics design methods and tools
- Design, modeling and optimization of batteries and hybrid energy storage systems
- Infrastructure analysis, modeling, simulation and optimization
- Energy-efficient vehicle and infrastructure design methods

Submitted articles must not have been previously published or currently submitted for journal publication elsewhere. Articles that have been previously published at a conference must have at least 30% new material and this addition should be clarified in

the cover letter accompanying the submission. As an author, you are responsible for understanding and adhering to the submission guidelines of the IEEE Transactions on CAD.

Please submit your paper to Manuscript Central at <http://mc.manuscriptcentral.com/tcad>

Please note the following important dates.

- **Submission Deadline: September 1, 2014**
- **Reviews Completed: November 15, 2014**
- **Major Revisions Due (if needed): January 15, 2015**
- **Notification of Final Acceptance: March 1, 2015**
- **For more information, please contact the Guest Editors:**

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