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Special Session on Emerging Solutions for Vehicular Embedded Systems

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TOPIC OF THE SPECIAL SESSION

A large share of innovation and customer value in modern vehicles comes from advanced computer-controlled functionalities. With the increasing volume of such functionalities, the vehicle software has tremendously increased in size and complexity over the past few years. Already today, the software in a modern car consists of millions of lines of code that runs on tens of distributed Electronic Control Units (ECUs) that can be connected by various types of in-vehicle networks, such as CAN, Flexray, LIN and Automotive Ethernet. The safety-critical nature of several vehicle functions puts real-time requirements on them. The developers of these functions are required to ensure their predictable timing behavior. In addition, the advanced features in modern vehicles require new levels of computational power and more complex coordination among subsystems. Multi-core ECUs offer a promising solution for running such computation-intensive vehicle functions. However, multi-cores are more prone to unpredictable behavior (due to share caches and memory banks) as compared to traditional single-core platforms. Clearly, there are many challenges related to handling the complexity, allowing reuse, supporting the required predictability and verifying timing requirements during the development of vehicular embedded software systems. The objective of this Special Session is to provide a forum to the researchers and practitioners for discussing novel and emerging solutions to these challenges. The topics of the special session are as follows.

- Model- and component-based development of vehicle software.
- Models and languages for the vehicle software development, e.g., EAST-ADL, AUTOSAR, etc.
- Real-time systems and real-time communication, e.g., AVB, CAN, CAN/FD, FlexRay.
- Time-Sensitive Networking.
- Scheduling and schedulability analysis techniques.
- Mixed criticality, multi-cores and advanced computing platforms.
- Autonomous vehicles, advanced driver assistance systems, V2X communications, connected vehicular systems.
- Safety, security and certification (e.g., according to ISO 26262) aspects in vehicles.
- Performance assessment, fault-tolerance and reliability issues in vehicular systems.
- IoT and cloud computing in vehicular domains.
- Tool support and industrial case studies for vehicular software embedded systems.

IEEE IES Technical Committee Sponsoring the Special Session: TCFA

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Author's schedule:

- Deadline for submission of special session papers
May 1, 2018
- Notification of acceptance
July 15, 2018
- Deadline for submission of final manuscripts
August 1, 2018