



28th INTERNATIONAL CONFERENCE  
ON EMERGING TECHNOLOGIES  
AND FACTORY AUTOMATION

2023

SINAIA, ROMANIA

SEPTEMBER, 12<sup>th</sup>-15<sup>th</sup>, 2023

## Call for Participation

### 5th Workshop on Advanced Technologies in Industrial Vehicular Systems (DIVERSE)

Organized and Co-Chaired by  
Saad Mubeen and Mohammad Ashjaei  
Mälardalen University, Sweden

- ❖ **FOCUS** The innovation in modern vehicles can be largely attributed to advanced computer-controlled functionalities. With the increasing volume of these functionalities, the complexity in vehicular systems has increased enormously over the past few years. For example, the software in a high-end car consists of millions of lines of code running on several tens of distributed Electronic Control Units (ECUs). These ECUs can be connected by five or more different types of on-board networks, such as CAN, CAN-FD, FlexRay and switched Ethernet solutions, including various set of standards such as TSN. Many vehicular functions are constrained by real-time requirements. Hence, the developers of these functions are required to verify their timing predictability at the design time and provide predictable execution environments at run-time. In addition, vehicular systems need to be supported for precise time synchronization, deterministic communications, high-bandwidth and ultralow latency onboard communication, zero congestion loss, reliability, and fault tolerance. These properties are paramount for the next generation of Automated Driving vehicles. The advanced features in modern vehicles also require new levels of computational power and more complex coordination among subsystems. Multi-core ECUs offer a promising solution for running such computation-intensive vehicular functions. However, such advanced ECUs face many challenges due to shared resources. The objective of this workshop is to provide a platform to the researchers and practitioners to present and discuss advanced technologies that can address the challenges faced by the developers of vehicular systems.

#### ❖ TOPICS

The workshop covers the advanced technologies and solutions for vehicular systems, mainly focusing on the following topics

- ❖ Models and languages for the development of software architectures
- ❖ Onboard network protocols, e.g., CAN, Automotive Ethernet, TSN
- ❖ Scheduling and schedulability analysis
- ❖ Autonomous vehicles, advanced driver assistance systems, V2X communications
- ❖ Advanced computing platforms for vehicular systems, e.g., multi-core
- ❖ Safety, security and certification (e.g., according to ISO 26262) aspects in vehicles
- ❖ Tool support and industrial case studies for vehicular embedded systems

- ❖ **WORKSHOP FORMAT.** Half-day workshop based on 6 invited presentations: 3 from academia and 3 from industry. Each presentation is planned to be 25-30 min, including questions. Moreover, there will be a panel discussion at the end.

## Workshop: September 12, 2023

### Workshop Presenters

- ❖ **Sara Afshar**, Volvo Construction Equipment, Sweden. Title: **Towards Smart Construction Vehicle Industry.**
- ❖ **Rafik Henia**, Thales, France. Title: **Synchronization in TSN Networks: One Clock to Rule them All.**
- ❖ **John Lundbäck**, Arcticus System, Sweden. Title: **Bringing Model-driven Vehicle Software Architectures and Timing Analysis Together: The Rubus Approach.**
- ❖ **Peter Ulbrich**, Technische Universität Dortmund, Germany. Title: **Whole-system timing analysis in embedded real-time systems.**
- ❖ **Matthias Becker**, KTH Royal Institute of Technology, Sweden. Title: **Time Critical Software on Automotive High-Performance Platforms.**
- ❖ **Gianluca Brilli**, University of Modena and Reggio Emilia, Italy. Title: **Fine-Grained QoS Control via Tightly-coupled Bandwidth Monitoring and Regulation for FPGA-based Heterogeneous SoCs.**
- ❖ **Panel Discussion (all presenters)**, moderators: Saad Mubeen and Mohammad Ashjaei