



Call for Participation

6th Workshop on Advanced Technologies in Industrial Vehicular Systems (DIVERSE)

Organizers and Chairs
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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

Full-day workshop based on 11 invited presentations – 5 from academia and 6 from industry. Each presentation is planned to be 25-30 min, including questions. A panel discussion will close the Workshop.

WORKSHOP PRESENTERS

- ❖ **Sara Afshar**, Volvo Construction Equipment, Sweden. Title: Smart Construction Industry.
- ❖ **Rafik Henia**, Thales, France. Title: Towards onboard dynamic reconfiguration of TSN real-time network.
- ❖ **Dakshina Dasari**, Corporate Research, Robert Bosch GmbH, Germany. Title: Silverline: An Orchestration Framework for Distributed Real-time systems.
- ❖ **Hans Lyngbäck**, HIAB, Sweden. Title: Overview and challenges in the development of software platforms and applications in the loader cranes segment.
- ❖ **John Lundbäck**, Arcticus System, Sweden. Title: Model-driven Vehicle Software Architectures & Timing Analysis using the Rubus Approach.
- ❖ **Ali Balador**, Ericsson, Sweden. Title: Computation offloading in Edge and cloud environment
- ❖ **Rolf Ernst**, Technical University of Braunschweig, Germany. Title: Managing large dynamic real-time data in vehicles and beyond.
- ❖ **Jean-Luc Scharbag**, University of Toulous, France. Title: On precision and robustness of IEEE802.1AS synchronization in TSN networks.
- ❖ **Matthias Becker**, KTH Royal Institute of Technology, Sweden. Title: Guaranteeing Pro-Active and Reactive Safety in intersections through resource management at the Edge.
- ❖ **Zenepe Satka**, Mälardalen University, Sweden. Title: Towards Seamless Connectivity: Exploring the Future of Real-Time Networks through TSN and 5G Integration.
- ❖ **Saad Mubeen and Mohammad Ashjaei**, Mälardalen University, Sweden. Title: DESTINE: Developing Predictable Vehicle Software Utilizing Time Sensitive Networking.
- ❖ **Panel Discussion (all presenters)**, moderators: Saad Mubeen and Mohammad Ashjaei