ETFA 2025 Porto Portugal 9-12 September

30th IEEE International Conference on Emerging Technologies and Factory Automation

Call for Participation – WS04
7th Workshop on Advanced Technologies in Industrial Vehicular Systems (DIVERSE)

Organizers and Chairs
Saad Mubeen, 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

- 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 Presenters

- **Dakshina Dasari,** Corporate Research, Robert Bosch GmBH, Germany**.** Title: Contract-Based Resource-Aware Orchestration.
- **Elena Lisova**, Volvo Construction Equipment, Sweden. Title: Product Cybersecurity.
- **Hans Lyngbäck,** HIAB, Sweden**.** Title**:** Applying Cybersecurity within Loader Cranes Control Systems.
- **Rafik Henia**, Thales, France. Title: Incremental and Resilient Time-Aware Shaper Configuration for TSN.
- **Jean-Luc Scharbarg,** University of Toulous, France. Title**:** Combining Model Checking and Network Calculus for a Tighter WCTT Analysis of Real-Time Switched Ethernet Networks.
- **Zenepe Satka**, Mälardalen University, Sweden. Title: TSN-5G Integration for Real-Time Remote Vehicle Control: Challenges and Implementation.
- **Gianluca Cena,** National Research Council of Italy, Title: CAN XL: From Inception to Cutting-Edge Standardization.
- **John Lundbäck**, Arcticus System, Sweden. Title: Bringing Model-Driven Software Architectures and Formal Analysis Together: The Rubus Approach.
- **Matthias Becker**, KTH Royal Institute of Technology, Sweden. Title: Logical Execution Time (LET) Task Chains: Analysis, Optimization and RTOS Support.
- **Mischa Möstl**, Technische Universität Braunschweig, Germany, Title: Taming the Complexity Beast: Is Our toobox Rich Enough?
- **Gianluca Brilli**, University of Modena and Reggio Emilia, Italy, Title: FPGA-based Acceleration for Next Generation Autonomous Vehicles.

- **AIM** The aim of the conference is to bring together the international community to present the latest research results, share new ideas and engineering breakthroughs, and discuss state-of-the-art challenges and future directions in technology and innovation in the broad domain of Automation with a focus on Industrial and Factory Automation.

- **WORKSHOP FORMAT**

Full day Workshop, based on invited presentations.
This Workshop will include 5 presentations from academia and 5 from industry. Each presentation will be allocated a 25-30 minutes timeslot, including time for question. Moreover, there will be a panel discussion at the end.
For any detail regarding registration to the Workshop, please refer to the ETFA 2025 website.