Workshop on Automotive Systems 2025

March 13, 2025, Florianópolis, Brazil

We are glad to announce the first LISHA Workshop on Automotive Systems 2025 (WAS 2025). The workshop will be hosted at the Center for Innovation, Research, Entrepreneurship and Technology at the Federal University of Santa Catarina (InPETU hub/UFSC). The goal of the workshop is to bring together researchers and practitioners of computing systems designed to support automotive applications, giving visibility to recent research and engineering work in the area and bringing together people with academic and experimental background on the design of such systems. The workshop is being sponsored by three automotive projects within the MOVER Program that are currently under execution at LISHA:

- **Secure and Privacy-Aware Data Lake for Vehicle Data Storage and Processing (AutoDL)** is a joint RD&I initiative by LISHA, mobway, Bosch, Renault and Stellantis, and promoted by *Line VI Rota 2030 Vehicular Connectivity*.
- **Intelligent Vehicle Telemetry and Supervision System (Auto5G)** is a joint RD&I effort of LISHA, Intelbras and Yak on the utilization of low-level 5G protocols for vehicular telemetry and supervision within the paradigm of the Internet of Things (IoT).
- **Intelligent Acquisition and Analysis System for ECUs (IASE)** is a joint effort of LISHA and Renault to investigate the possibility of applying Artificial Intelligence (AI) techniques within the paradigm of the Internet of Things (IoT) to optimize the operation of Internal Combustion Engines, particularly in respect to the calibration of controller's parameters and anomaly detection.

Scope

Over the past two decades, vehicles have evolved into complex distributed systems on wheels. Even the most basic models now incorporate numerous Electronic Control Units (ECUs) that are interconnected through various networks. During this time, artificial intelligence has increasingly become integrated into automobiles in a variety of applications, including optimizing fuel efficiency, implementing Advanced Driver Assistance Systems (ADAS), and the emergence of the first wave of fully autonomous vehicle prototypes. Emerging communication technologies like 5G and IEEE 802.11p are facilitating connectivity between vehicles and enabling communication with a wide array of other systems globally. In this dynamic landscape, the imperative to maintain seamless, fail-safe, secure, and efficient vehicle operations presents a formidable challenge that paves the way for continuous research and development.

Topics of Interest

- Architecture design, implementation and management of safe and secure vehicles
- Connected vehicles and vehicular communication (V2X)
- Intelligent Transport Systems and Infrastructure
- Vehicular Data Lakes and Data Privacy
- Advanced Driver Assistance Systems (ADAS)
- Vehicular Safety Models and Safety Verification
- Practical or industry experiences and testbeds related with safety and security of vehicles
- Machine Learning and Analytics applied too automotive systems

Venue

LISHA's Workshop on Automotive Systems 2025 will be held at the Center for Innovation, Research, Entrepreneurship and Technology (InPETU hub) and at the Solar Energy Laboratory (Fotovoltaica) at the Federal University of Santa Catarina in Sapiens Parque. Check the map to get there.

Organization

- Leonardo Passig Horstmann
- José Luis Conradi Hoffmann

Program

Time	Title	Presenter
09:00 - 09:05	Opening	Antônio Augusto Fröhlich
09:05 - 10:00	Guided Tour of UFSC Infrastructure at Sapiens Parque	Giovani Gracioli
10:00 - 10:30	*Coffee Break*	
10:30 - 11:00	SmartData on Wheels: an AV Testbed with Hardware-in-the-Loop Simulation	Leonardo Passig Horstmann
11:00 - 11:20	Run-Time Verification and Safety Models	José Luis Conradi Hoffmann
11:20 - 11:40	LISHA's Vehicular Data Lake and Machine Learning Workflows	Rodrigo Gonçalves
11:40 - 12:00	Privacy in Vehicle Trajectories: Risks and Data Protection in the Connected Automotive Ecosystem	Jean Martina (LabSEC / UFSC)
12:00 - 13:20	*Lunch*	
13:20 -13:40	Mapping of Outdoor Environments for Autonomous Navigation	Felipe Oliveira (UFAM)
13:40 - 14:00	Computer Vision-Based Vibration Estimation	Leonardo Pezenatto da Silva
14:00 - 14:20	Machine Learning-Based Intrusion Detection in Automotive CAN Networks	Giovani Gracioli
14:20 - 14:40	Collaborative Perception	Mateus Martínez de Lucena
14:40 - 15:00	The Path to Driverless Formula SAE	AMPERA
15:00 - 15:30	*Coffee Break with Posters*	Graduate Students

Time	Title	Presenter
15:30 - 16:55	Internal Project Discussions	Auto5G - AutoDL - IASE
16:55 - 17:00	Final Remarks	Giovani Gracioli

Sponsorship

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