

Connected and Autonomous Driving



ERAdiate **LECTURE SERIES**

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**Scientific
Board Room,
Nová Menza**

Abstract

Digitalisation has created the technological conditions for the development of Connected and Autonomous Vehicles (CAV). It will have impacts on safety and traffic management, but also, more widely, on mobility behaviour, the environment, employment and social inclusion. The development CAV will, in turn, generate an increasing amount of data. This is providing greater quantities and quality of the data available for transport planning and management, as well as for new features and services to transport users, including innovative business models.

Vehicle platooning is part of a suite of features that CAVs might employ. A platoon is a group of vehicles that can travel very closely together, safely at high speed. Each vehicle communicates with the other vehicles in the platoon. There is a lead vehicle that controls the speed and direction, and all following vehicles (which have precisely matched braking and acceleration) respond to the lead vehicle's movement.

In the first presentation **Vehicular Communications for Platooning** - platooning as an emergent vehicular application with collaboratively and co-ordinately controlled connected vehicles will be addressed. First, the state-of-the of this technology will be explained and related recent R&D projects in Europe will be referred. Then, the up-to-date ETSI ITS-G5 vehicular communications protocols concerned with the inter-vehicular information exchange for automatic control will be addressed. Finally, performance evaluation

results for Cooperative Awareness Messages triggering protocol which couples messages generation with vehicular mobility will be presented.

Since two decades V2X (Vehicle to everything) communication is expected to progress driving safety and provide smarter and cleaner mobility. The driving environment in the first generation of automated driving vehicle will rely on internal sensors. However, it is widely acknowledged that elaborating and maintaining thorough real time representation of the driving environment will require collecting significantly more information from connected devices. IoT is addressing the critical challenge to manage the virtual representation of the different driving environment actors, in particular creating and maintaining their virtual representation in Cloud computing platform.

IoT will provide a new V2X paradigm based on a standardised middleware to manage the automotive Big Data for the Cooperative Automated Mobility. In the second presentation - **IoT pushing a new V2X paradigm for progressing Connected and Automated Driving** - will demonstrate how the H2020 Innovation Action "AUTOPILOT" will progress automated driving with IoT.

Connected and Autonomous Vehicles are expected to have an overall positive impact on our economy and society. It is anticipated that sectors like automotive, electronics and software or freight transport will be positively affected while other sectors like insurance or maintenance and repair will face significant challenges. Important labour changes lie ahead for professional drivers, decreasing driving tasks towards new more technical roles. Some of these jobs will disappear in the long-term. In the third presentation - **An analysis of possible socio-economic effects of a Cooperative, Connected and Automated Mobility (CCAM) in Europe** - the discussion will focus on the possible effects of automated driving on the economy, employment and skills and is integrated into the definition of an EU approach towards CCAM by strengthening the Commission's understanding of the societal aspects linked to it.

Programme

10.00: Opening by Prof. Milan Dado, ERAdiatE Project Coordinator, Univ. of Žilina (Slovakia)

10.10: Introduction by Prof. Tatiana Kovacikova, ERA Chair Holder, Univ. of Žilina (Slovakia)

10.20: Vehicular Communications for Platooning by Prof. Alexey Vinel, Halmstad University (Sweden)

10.50: IoT pushing a new V2X paradigm for progressing Connected and Automated Driving by Francois Fischer, ERTICO - ITS Europe (Belgium)

11.20: An analysis of possible socio-economic effects of a Cooperative, Connected and Automated Mobility (CCAM) in Europe by Maria Alonso-Raposo, JRC Ispra (Italy)

11.30: Panel Discussion

13.00: Closing

