

# Driving the Future of Connected Autonomous Mobility with Advanced AI and Multi-Modal Data Fusion

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## Abstract

In this talk, we will explore the intersection of connected autonomous vehicles (CAVs), edge computing, multi-agent cooperation, computer vision, and large language models (LLMs) to tackle emerging challenges in intelligent transportation. Edge computing enables decentralized, low-latency processing, essential for real-time decision-making in tasks such as obstacle detection and navigation. Multi-agent cooperation, in this context, focuses on efficient sharing of radio and computational resources, ensuring that vehicles can dynamically allocate bandwidth and processing power to maintain high performance in communication and computation-heavy environments. Computer vision technologies enable vehicles to interpret complex surroundings through advanced scene analysis, enhancing safety and decision-making. Additionally, LLMs contribute to processing large amounts of contextual data, enabling more human-like reasoning and complex decision-making. Together, these technologies offer a holistic approach to advancing the capabilities of autonomous vehicles, creating more robust, intelligent, and sustainable transportation systems.

## Short Bio



Juraj Gazda is a distinguished expert in computer science and artificial intelligence, with extensive experience in academia and industry. He graduated from the Faculty of Electrical Engineering and Informatics at the Technical University of Košice (FEI TUKE) in 2007, gaining international exposure as an Erasmus student at Delft University of Technology in the Netherlands. He pursued his PhD at the Department of Electronics and Multimedia Telecommunications (KEMT) at FEI TUKE, focusing on 4G communication systems, and completed prestigious internships at Ramon Llull University in Barcelona and the Technical University of Hamburg.

After earning his PhD, he worked with renowned companies such as Honeywell Aerospace, Siemens, Nokia, Ericsson, and Verizon Wireless in Dallas, Texas, specializing in advanced telecommunications technologies. He achieved significant academic milestones, earning his habilitation in 2016 and being promoted to full professor in 2021 in the field of Informatics. His research focuses on applying AI to communication networks and autonomous mobility, with expertise in computer vision, edge computing,

and large language models. Juraj actively collaborates with international institutions, including the University of California, Irvine, and the Czech Technical University in Prague, contributing to innovative AI and communication technology projects. His work has been published in leading journals such as *IEEE Transactions on Vehicular Technology* and *IEEE Transactions on Intelligent Transportation Systems*, where he also serves as a regular reviewer.