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5G NetMobil

Motivation:

While autonomous driving already promises more comfort and safety, tactile inter-connected driving makes new driving strategies possible which further increase road traffic safety, significantly reduce CO² emissions and considerably improve traffic efficiency on the roads by better capacity management and reduced danger of traffic jams and accidents.

The technical innovations of recent years enable largely automated driving in less complex driving situations, e.g., on highways - but with limited or even no capabilities of predictively looking ahead and always very defensive. In urban traffic, with an unclear traffic infrastructure, complex driving and turning situations as well as with hard-to-record road users such as cyclists and pedestrians, today's technologies still reach their limits very quickly. Future connected mobility solutions have to be designed to deal with complex situations of driving and coordination: e.g., for high density platooning, interconnected emergency breaking systems, safe driving in cities in presence of bicycles and pedestrians at intersections.

To meet and cope with the complex technical challenges of highly dynamic and cooperative vehicular networks, a new generation of mobile communications is needed that enables tactile inter-connected driving for automated, safe and efficient mobility even in highly frequented urban areas.

Vodafone Chair Contribution:

The Vodafone Chair Mobile Communications Systems is co-coordinator of the **5G NetMobil** project and concentrates on a variety of different aspects with focus on the tactile radio access:

- **Radio resource management strategies** (centralized/network-assisted local/distributed) to reduce Radio Access Network (RAN) latency with TTI<1ms
- **Selection strategies** for choosing the best appropriate technology to fulfill application-specific QoS requirement and increase the capacity of the network
- **Combining strategies** on RAT level to increase network availability and transmission reliability

Objective:

Main objective of the **5G NetMobil** project is to develop a holistic communications architecture for tactile interconnected driving and to demonstrate its advantages over autonomous driving based solely on local sensor data in relation to road safety, environmental impact and traffic efficiency.

Approach:

Implementing this vision into reality requires secure and robust communications for operating and control in real-time. Therefore, an innovative 5G communications architecture with relevant information and communication technologies will be developed in **5G NetMobil** which will enable the tactile internet for tactile interconnected driving. The integration of existing technologies such as cellular 4G or IEEE 802.11p will also be considered in this context.

The consortium aims to analyze the requirements of future connected driving, and research on limits of latency and reliability in wireless technologies. Further research considers enhanced concepts for radio resource management, multi-Radio Access Technologies (Multi-RAT) diversity, reliable broadcasting, relaying, low latency multi-hop transmission, network slicing, Quality of Service (QoS) prediction and reducing E2E latency enabled by Mobile Edge Cloud (MEC) technologies.

