

TOWARDS IOV (INTERNET OF VEHICLE) BASED ON 5G RADIO NETWORK AND OPTIMIZATION AND LEARNING ALGORITHMS

SUPERVISOR: Oumaya BAALA (Associate Professor) – oumaya.baala@utbm.fr

RESEARCH TEAM: FEMTO-ST INSTITUTE

UNIVERSITY: UTBM (University of Technology of Belfort-Montbéliard)

CONTEXT

The Internet of Vehicles (IoV) is a convergence of the mobile Internet and the Internet of Things (IoT). The connection of vehicles to the Internet enables new applications, which bring new functionalities to the individuals thus making of transport easier and safer. In this context, the concept of Internet of Vehicles (IoV) represents future trends for smart transportation and mobility applications. Some Intelligent Transport System (ITS) applications will require very low latency, much lower than is currently provided by existing communication networks.

5G networks are expected to offer very high data rates, extremely low latency, and significant improvement in users' different QoS requirements. Then, 5G will provide the foundational infrastructure for building smart IOV environment and supporting the functions of sensing, networking, computing and controlling.

OBJECTIVE

IoV is a new paradigm that can be seen as a large-scale network composed of an inter-vehicle network, an intra-vehicle network and vehicular mobile Internet.

From this point of view, the IoV is a large-scale distributed system exchanging information between diverse entities such as vehicles, roads and Internet. Such a distributed system promises to be the ideal support for traffic management, users' services, infotainment, autonomous vehicle management... which are typical applications of IoT in intelligent transport system.

The emerging new technologies in the fifth generation (5G) mobile communication networks such as new signal processing schemes, cloud computing, network virtualization (NFV), network slicing, resources management and so on, may significantly facilitate and decouple network functions from dedicated hardware and meet various requirements of IoV networks. Thus, it can greatly improve the efficiencies in transportation infrastructures while reducing the traffic congestions, emergencies and accident. Moreover, the processing and storage technologies of big data in IOV networks become very important with the massive number of vehicles connected by 5G networks. This can be based on the intelligence and learning capabilities to anticipate the end-user needs.

METHOD

Building on research previously carried out, the PhD candidate will contribute on:

- Analysing existing models to evaluate the wireless connectivity
- Creating knowledge from the network data in the context of heterogeneous technologies
- Proposing enhanced solutions to make decision about resource allocation and self-configuration to meet QoS requirements.

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