ANALYSIS AND REVIEW OF 5G BASED SMART VEHICLE

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Abstract

As the number of vehicles is increasing day-by-day, the question of how to obtain information about the Vehicles is becoming more and more difficult. In such an situation Intelligent Transportation Systems (ITSs) has emerged as a solution that is an advantage from the unique features and capabilities of Wireless Sensor Networks (WSNs) and Internet of Things (IOT). WSNs are composed of tiny devices that work in manner to sense the parameters of the vehicle. ITSs can also solve situations like intimating ambulance after occurrence of accident and track the location of the vehicle using GPS sensors.

Commonly, a smart vehicle is equipped with the following devices and technologies: (i) a Central Processing Unit (CPU) that implements the applications and communication protocols; (ii) a wireless transceiver for data transmissions among vehicles (V2V) and from vehicles to RSUs (V2I); (iii) a Global Positioning Service (GPS) receiver for positioning and navigation services; (iv) different sensors laying inside and outside the vehicle to measure various parameters (i.e., speed, acceleration, distance from neighbouring vehicles, etc.); (v) an input/output interface for human interaction with the system.

The basic idea of smart vehicles is addressed to safety issues, and then by a proper combination of functionalities like control, communications, and computing technologies, it will be possible to assist driver decisions, and also prevent wrong driver's behaviour.

While initial specifications enabled non-standalone 5G radio systems integrated in previous-generation LTE networks, the scope of Release 15 expands to cover ‘standalone’ 5G, with a new radio system complemented by a next-generation core network. It also embraces enhancements to LTE and, implicitly, the Evolved Packet Core (EPC). This crucial way-point enables vendors to progress rapidly with chip design and initial network implementation during 2019.

With new specifications of standalone 5G-NR we can deploy 5G networks in Smart Vehicle communications for low latency and ultra reliability.

Keywords or phrases: Intelligent Transportation Systems(ITS),Wireless Sensor Networks(WSN),Internet of Things(IOT),Global Positioning Service (GPS),Vehicle to Infrastructure(V2I),Long Term Evolution(LTE)