Internet-of-Vehicles for Connected Autonomous Driving

Mots clés :
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Résumé du projet de recherche (Langue 1)

Autonomous vehicles have been presented during the GM Futurama in 1939, and their technology specifications formally designed already in the 80’s. Such effort could unfortunately not reach production state mostly due to the cost of the required communication (analogic radio) and detection radars. The deal partially changed with the appearance of affordable positioning (GPS), communication (DSRC), and data warehouses from the Internet Cloud. As demonstrated by Google and its driverless car, or more recently by major car manufacturers (BMW F+T, Daimler, Tesla...), control mechanisms driving a vehicle autonomously are nowadays mature. But a long road remains ahead of us before we can see autonomous vehicles in the streets. Beside legal and societal aspects, the major reason still comes from the significant cost of providing the data required by control mechanisms to safely navigate vehicles (e.g., the cost of Google’s rotary lasers (LIDAR) is approx. 80’000 euros). Recent appearance of dedicated short range communication (DSRC) between vehicles, using a WLAN extension to vehicular environments (IEEE 802.11p), showed to be a flexible method to interconnect vehicles to exchange data, for instance to improve traffic safety or provide smart mobility solutions. Through DSRC and in cooperation with cellular technologies, vehicles may not only connect to Internet, but be part of an Internet-of-Vehicles (IoV). From a communication perspective, the IoV opens doors to large amount of data available in the cloud or between vehicles that could be available to connected autonomous driving (CAD) vehicles. From a mobility perspective, cooperative mobility strategy could be devised to enhance the performance of autonomous navigation. In the context of this thesis, we propose to analyze the benefits of an Internet-of-Vehicle built from DSRC and 4G/5G networks to provide precise, secured and affordable data required by the control mechanisms of CAD vehicles.

Informations complémentaires (Langue 1)

EURECOM has international cooperation through its academical and industrial partners, and mobility between partners is encouraged.

Informations complémentaires (Langue 2)

Thématique: H