IE.3515 – Connected Vehicles

Module title: Connected Vehicles
Module code : IE.3515
ECTS : 5
Person in charge : Frédéric AMIEL
Workload : 100h including 45h face -to-face
Keywords : automobile, electric vehicle, connection, standards, security, deep learning

Presentation

The advent of the autonomous car should reduce urban traffic jams, free up parking spaces, reduce pollution, improve travel comfort...

From now on, the car will be a truly connected communicating object. Users and their smartphones are integrated into the vehicle, which communicates with a range of connected on-board equipment, as well as with urban infrastructure and other vehicles.

Increasingly powerful sensors contribute to driving assistance and user comfort, while increasing automation helps with maneuvering. These technologies make it possible to better manage traffic flows, ease driving constraints and so on. These technologies are working together and leading to fully autonomous individual vehicles.

Finally, electric vehicles now account for an increasingly large proportion of the vehicle fleet.

Academic objectives

By the end of the module, students will have more specifically:

- Analyzed the transport problem,

- Taken constraints into account and modelled them.

- Designed safe and standardized vehicles

- Mastered their design as well as quality, safety and security, including the impact of the confidentiality of exchanges.

- We are at the project management level.

Prerequisites

The prerequisites are fundamental knowledge of electronics and computing.

Content/programme

Concepts

- *Sensors,*

- *Connectivity*

- *Security,*

- *Standards,*

- *Electric vehicle architecture*

- *Operational safety,*

- *Power components,*

- *Driving algorithms*

Know-how

- *Design of connected vehicles.*

Tools used by students

Simulation software tools will be used for electronic design and for practical work in deep learning.

Academic conditions

Learning methods

Course with presentations on the various items. Some practical work will be used to illustrate the AI part of the driving algorithms.

Assessment methods

This module will be assessed by means of a table-top, individual final knowledge test. The AI part will be assessed by a small project carried out in pairs.

Working language

Module delivered entirely in English, student productions in English.