

Secure Framework for IoV (Internet of Vehicles)

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The IoV (Internet of Vehicles) has been developed as an effective mechanism to link human connectivity and transportation for many years. In the past few decades, with the development of communication technologies and the increasing need for urban mobility, the connected vehicles services have been quickly grown. However, their security requirements are gradually exposed.

In this context, this thesis proposal aims to design and to validate a secure vehicular framework using new security approaches to manage security requirements in vehicular context. Several scenarios have to be defined to pinpoint the different security requirements and test the proposed solutions. Different intelligent approaches based on artificial intelligence techniques (machine learning, deep learning, game theory, etc.) should be considered to optimize the energy consumption of the proposals.

Tasks planning

- 1) Task 1: To elaborate a state of the art related to the security requirements and proposed solutions to solve security attacks to which the connected vehicles are exposed.
- 2) Task 2: To elaborate a state of the art related to the use of the artificial intelligence techniques related to the energy consumption in vehicular networks.
- 3) Task 3: To design and validate a secure framework to improve and secure intra and inter communications between connected vehicles.
- 4) Task 4: To propose, specify and validate a new security approach to secure the connected vehicles based on one of the artificial intelligence techniques. The security approach should be dynamic and contextual to take into account the mobility and distributed aspects of vehicular networks.
- 5) Task 5: To study the energy impact of the solution proposed through a performance evaluation and improve the green aspects of the proposals.