Automotive Application

Tutors: Rafael Direito (rafael.neves.direito@ua.pt) and Diogo Gomes (dgomes@ua.pt)

Group Size: 4 to 5

The Telecommunications Institute has deployed various equipment, such as radars, cameras, weather stations, and other sensors, along the A25 highway. This array of devices provides vast amounts of data that can be leveraged for novel automotive use cases and applications. Figure 1 illustrates some of the equipment deployed by the Telecommunications Institute.

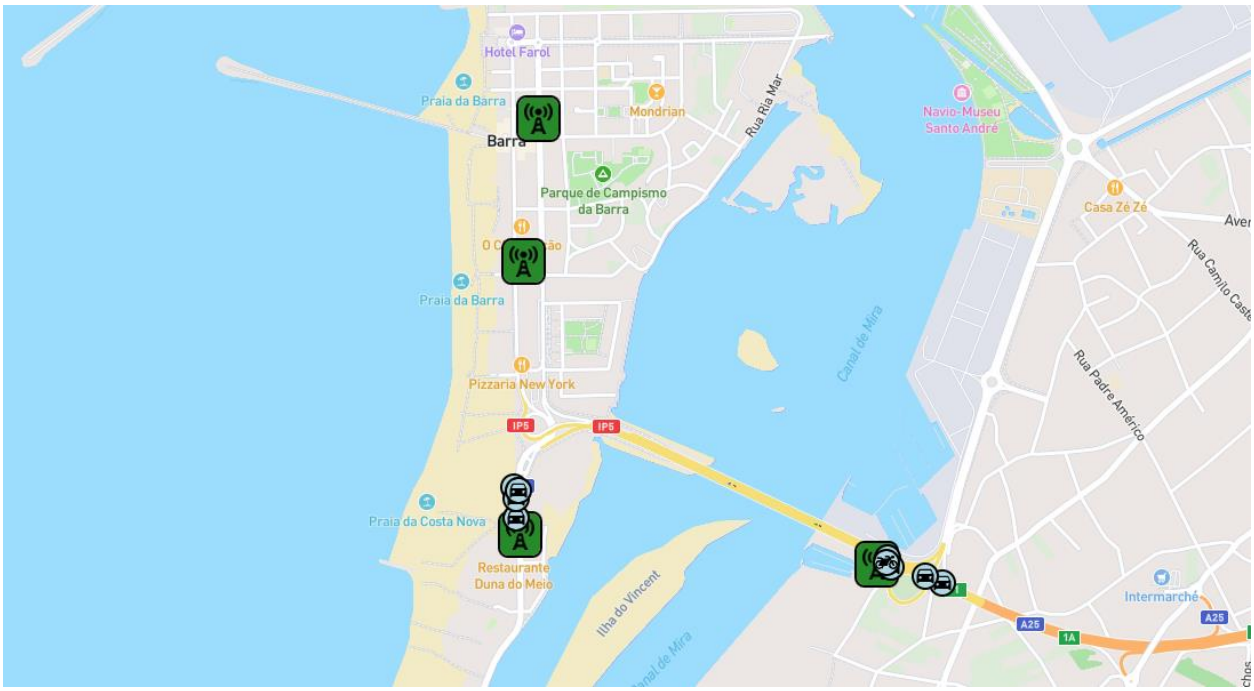

Figure 1 - Deployed Automotive Sensors/Equipment

By consuming and analyzing the data provided by these sensors, it becomes feasible to alert vehicles of emergency situations, such as weather events, or even propel novel scenarios with automated maneuver coordination between vehicles. Additionally, the collected data also enables traffic monitoring (e.g., accidents, traffic queues, etc.) and the dissemination of alerts to nearby vehicles.

This group project focuses on the development of an automotive application to leverage the sensor data previously introduced. This application should aid vehicle drivers by consuming and disseminating emergency events, showcase traffic status, and support coordinated maneuvers.

Requirements:

- As a first step, the students shall explore the various equipment installed by the Telecommunications Institute of Aveiro (ITAv) along the A25 highway.
- Based on the installed equipment, students should derive various use cases that can be achieved using the information provided by the installed equipment (e.g. emergency alerts, traffic events, etc.)
- After identifying the various use cases that can be achieved, the students should propose an architecture to fulfil the objectives previously introduced.
- The proposed architecture should include an application that can be installed with either Android Auto or Apple CarPlay

Expected Results:

- Comprehensive use cases that leverage the information provided by ITAv's equipment.
- A detailed architecture to collect, analyze, and generate traffic events based on the equipment data.
- An Android Auto or Apple CarPlay application to assist drivers.