universidade de aveiro

instituto de telecomunicações

NAP

Plataforma de gestão de tráfego e segurança rodoviária para a infraestrutura Aveiro Tech City Living Lab

PI - Grupo 7

TABLE OF CONTENTS

01. Our Team

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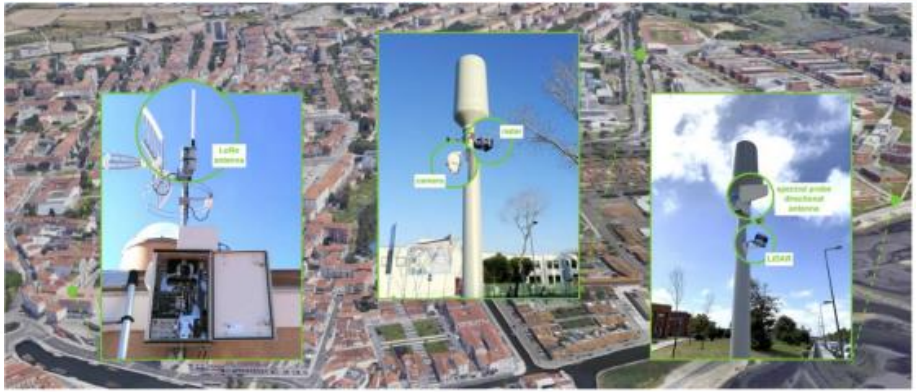
02. Project Context

Context



https://aveiro-living-lab.it.pt

Global View

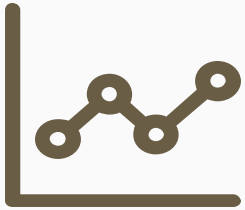
Develop a traffic management and road safety platform that analyzes and processes data in real-time.

This work aims to explore analyses of uncommon periods in the city by examining correlations between traffic congestion and meteorological data.

Requirements

- Sensors: lidars, radars and cameras to a generate data;
- Platform that aggregates and analyses the data from the sensors as well as data from different applications and generate events;
- Machine Learning models to interpret all the data;

03. Project Goals



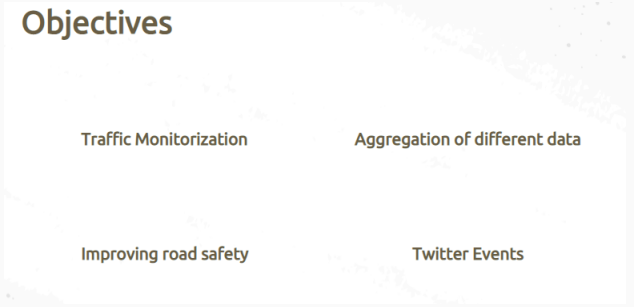
Objectives

Traffic Monitorization

Aggregation of different data

Improving road safety

Twitter Events



Problems

- Implementacion of the platform in the existent structure of Aveiro Tech City Living Lab
- Integrate the events from the data of the sensors with data and events of other mobility applications
- Analysis of unusual periods in the city using correlations between traffic congestion, meteorological data and road conditions
- Machine Learning (ML) model training

04. Sneak Peek

Calendar

Tasks	Deadlines	Done By
Define the architectures and frameworks to be used.	14/03/2023 Milestone 2	All
Start the development of the API and the required backend for the platform. Process the data from the sensors. Integrate with data from mobility applications (HERE, Waze). Integrate with Twitter events.	28/03/2023	All
Combine all data to generate events. Develop the interface for the analysis platform.	11/04/2023	All
Prototype, mid-term presentation.	11/04/2023 Milestone3	All
Implement machine earning to analyze unusual periods in the city.	02/05/2023	All
Connect the entire system to the OpenLab infrastructure. Write the documentation.	23/05/2023	All
Submit technical report (final version). Demo and poster for students@deti & video.	30/05/2023	All
Final Project presentation.	06/06/2023 Milestone 4	All

Expected Results

- Develop a platform that is able to represent different types of data analysis, including the study of data from distinct types of sensors;
- Study different events by training the model with all the given data;
- Conduct research using weather and road conditions data to correlate with traffic conditions.

05. Related Work

Related Work

Genetec – Trafics Sensor Management

- Uses different types of sensors to capture real-time traffic data;
- Uses dashboards to create detailed visual reports;
- Sets the data to generate automated alerts;
- The goals of the project:
  - Track area occupacy;
  - Monitor traffic flow;
  - Detect developing incidents;
  - Manage parking areas.

Similar to our project data collection and goals

https://www.genetec.com/products/unified-security/security-center/traffic-sensor

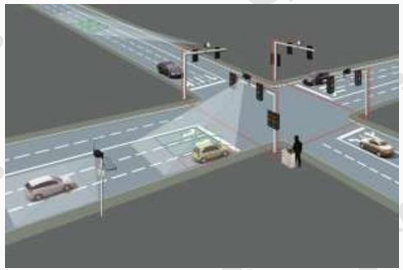
Related Work

Adaptive-Traffic-Signal-Control-System
Solve Traffic Congestion

- Uses computer vision and machine learning to have the characteristics of the traffic flow at a signalized road intersection;
  - Waiting time per vehicle;
  - Queue density.

- Based on that data:
  - Control the traffic lights, allowing the maximum number of vehicles to pass safely with minimum waiting time.

Similar to our project: Uses YOLO (You Only Look Once) and bounding boxes – Object detection



https://github.com/VedantKhairnar/Adaptive-Traffic-Signal-Control-System

06. Communication Plan

Communication Plan