

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

Milestone 3 – Construction Phase

Projeto em Informática

11th April 2023

Group 7



deti

universidade de aveiro
departamento de eletrónica,
telecomunicações e informática



instituto de
telecomunicações

NAP

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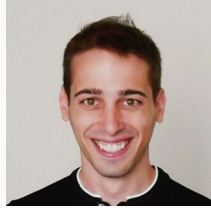
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Plans for the next
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01. Context



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

01. Context

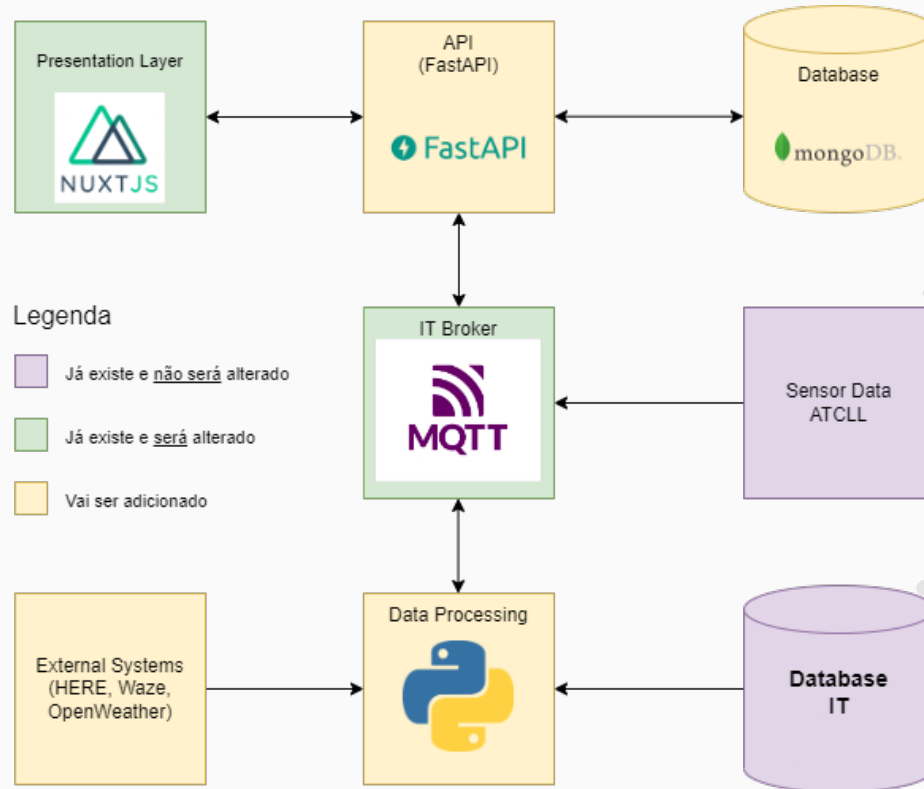
- Generate events based on real-time sensor data from ACTLL (Aveiro City Tech Living Lab), statistics and previous behaviours in a given area.
- Integrate with events from external mobility applications (HERE, Waze).
- Analyse uncommon periods in the city by correlating traffic flow, events, weather and road conditions.
- Train a machine learning model with historic data to predict traffic flow.



01. Calendar – Milestone 3

Tasks	Deadline	Done By
Start the development of the API and the required backend for the platform. Integrate with data from the ACTLL (Aveiro City Tech Living Lab) sensors. Integrate with data from mobility applications (HERE, Waze).	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 <u>Milestone3</u>	All

02. Architecture Diagram



03. Back-end



Data Processing

- Receive Data from the sensors.
- Request Data from HERE.
- Analyze and parse the Data received.
- Create the Events and Traffic Flows.



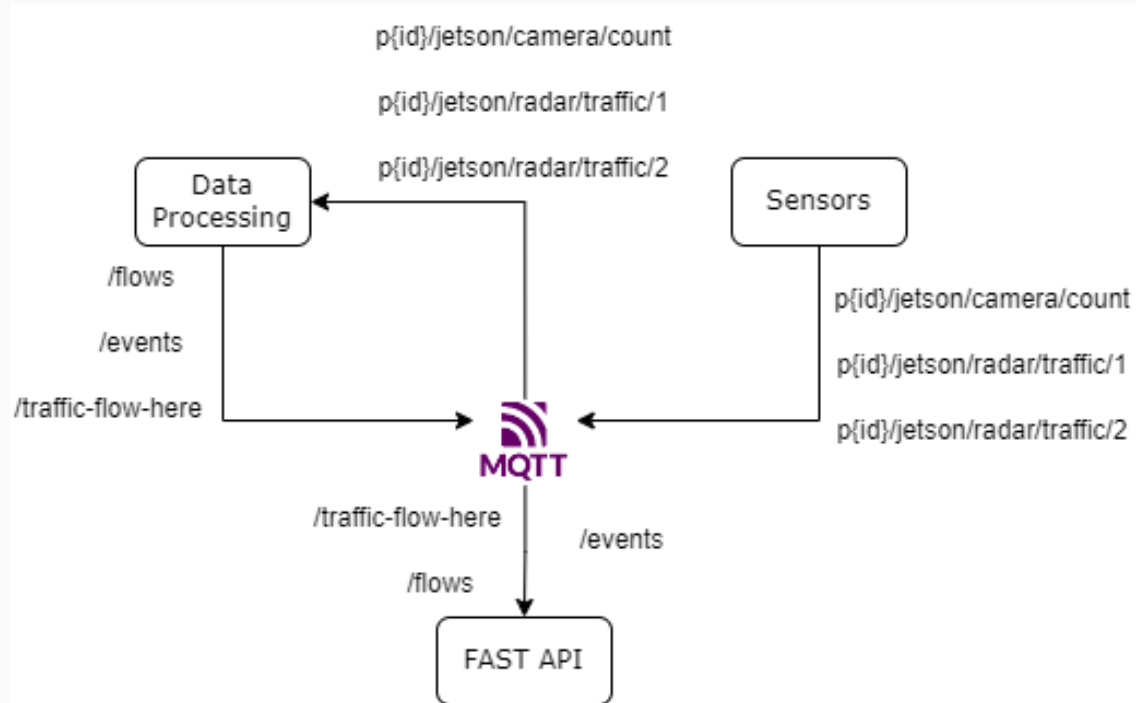
REST API

- Save the Events and Traffic Flows.
- Request Events or Traffic Flows.
- Filter Events or Traffic Flows.
- Request the Data from HERE.

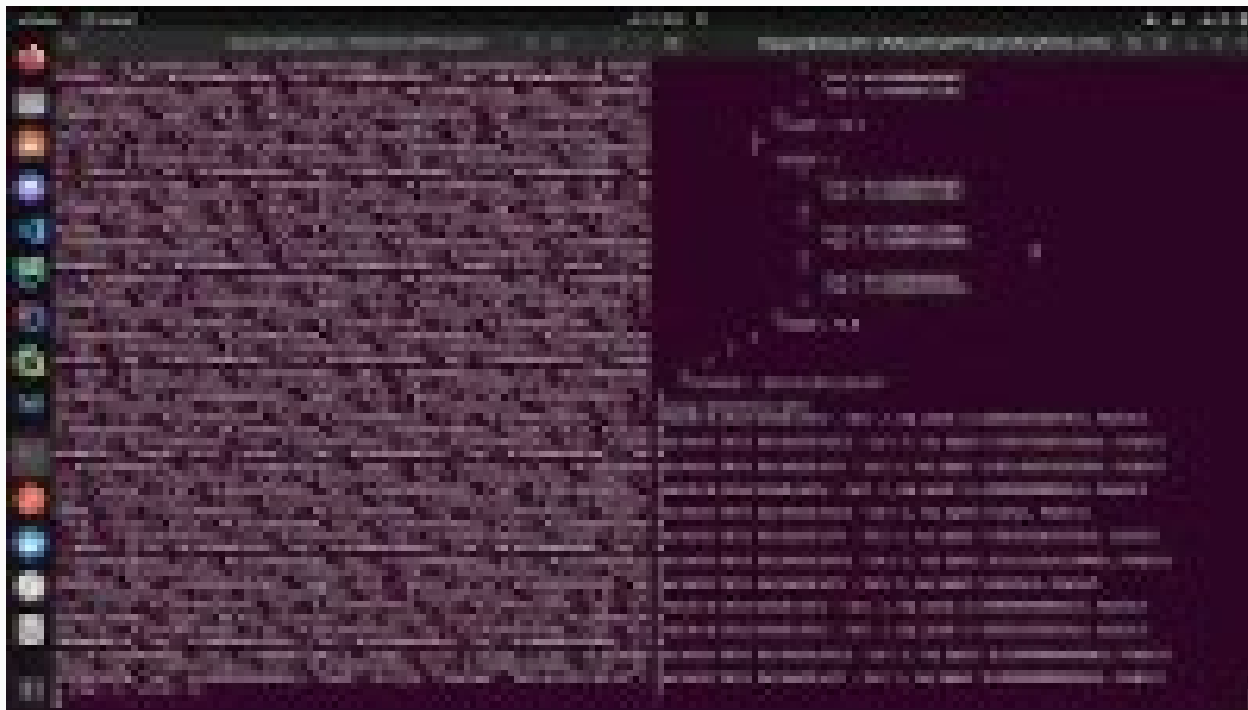
03. Back-end

here		^
GET	/here/get_traffic_flow Get Traffic Flow	▼
GET	/here/get_traffic_incident Get Traffic Incident	▼
testmongo		^
GET	/testmongo/testmongo Test Mongo	▼
GET	/testmongo/testmongo2 Test Mongo2	▼
GET	/testmongo/testmongo3 Test Mongo3	▼
events		^
GET	/events/get_events Get Events	▼
GET	/events/get_event/{id} Get Event	▼
GET	/events/get_events_filtered Get Events Filtered	▼
flows		^
GET	/flows/get_flows Get Flows	▼
GET	/flows/get_flow/{id} Get Flow	▼
GET	/flows/get_flows_filtered Get Flows Filtered	▼

03. MQTT Messages



03. Back-end - Video



04. Event Detection - YOLO

- YOLOv8: state-of-art object detection algorithm.
- Bounding boxes and class probabilities.

Done

Potholes

Future

Floods
Armed people
Badly parked cars
Cars driving the wrong way

04. Pothole Detection – Video



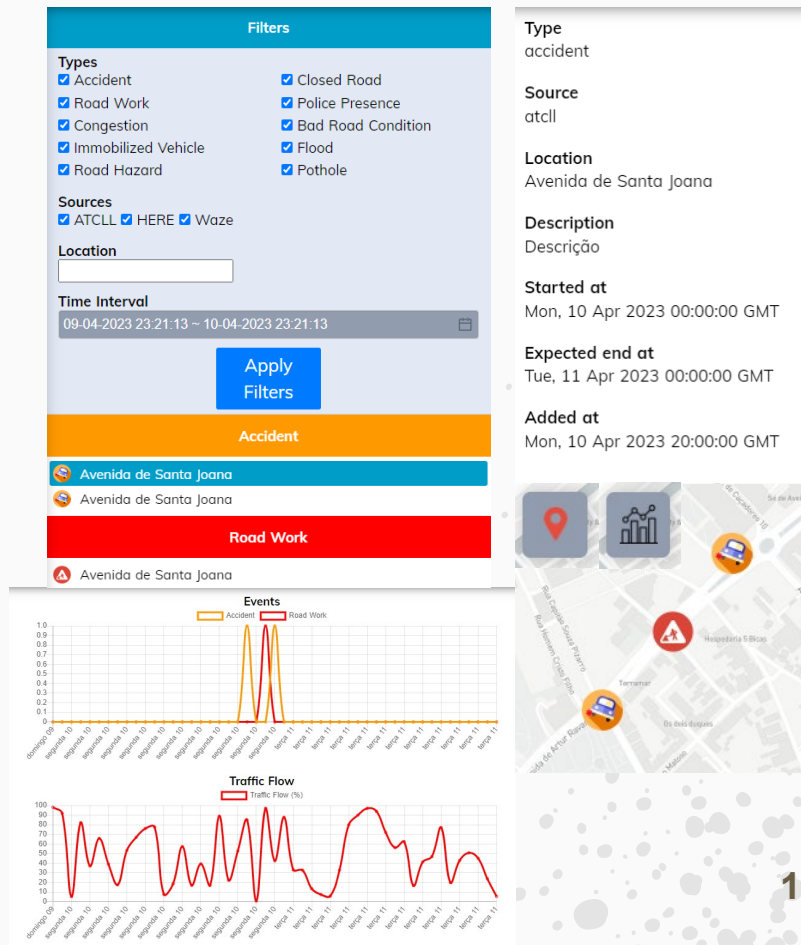
05. Front-end



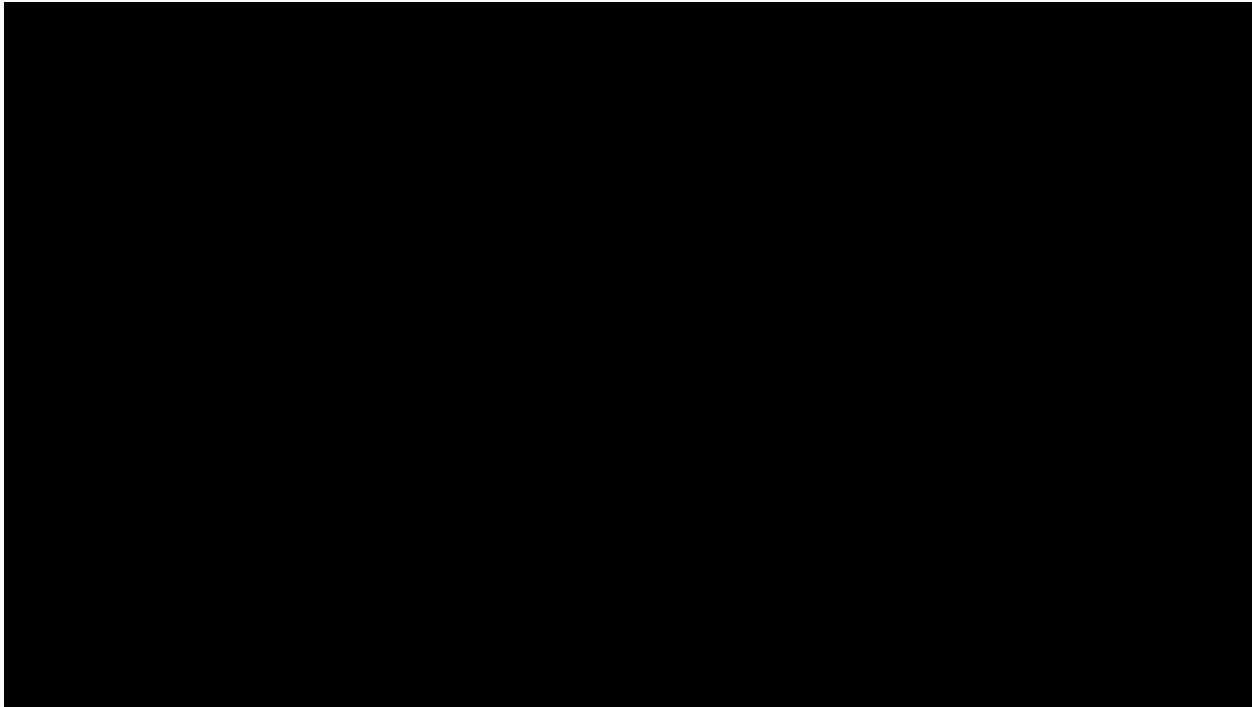
Aveiro Tech City Living Lab

- Display events: list, map, details.
- Filter events: type, source, location, time interval.
- Switch between details and graph view.
- Graphs: events, traffic flow, weather.

Future: Display traffic flow on map, graph for predicted traffic flow.



05. Front-end - Video



06. Next Steps

Tasks	Deadline	Done By
Implement a machine learning model to predict traffic flow. Train YOLOv8 models to detect other kind of events. All main frontend elements implemented.	02/05/2023	All
Connect the entire system to the ACTLL 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 <u>Milestone 4</u>	All