



# Mobility platform in Aveiro Tech City Living Lab infrastructure

Milestone 1, Inception

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# Context

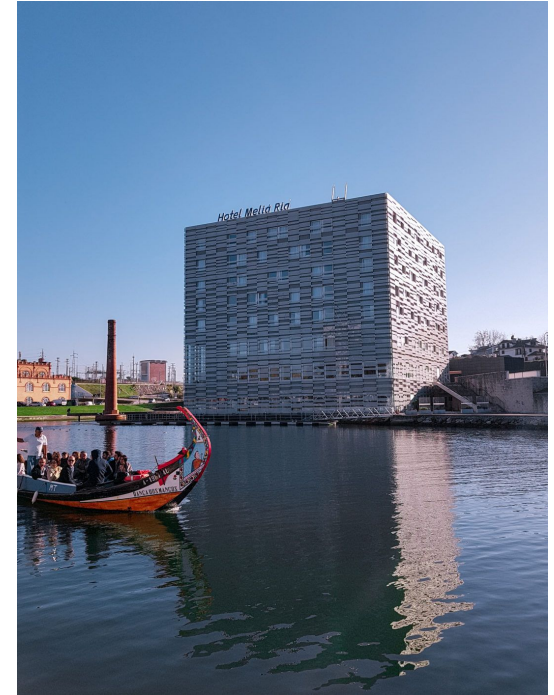
- In Aveiro there are 44 stations installed and interconnected with fibre
- The stations contain environmental sensors, radars, LIDARs, video cameras and computer edge units
- This infrastructure is connected to the data center in IT
- **Goal:** collect data related to the amount of people, vehicles and *moliceiros* that circulate in that area



green home → buildings  
green pins → smart lamp posts  
blue pins → LoRa/LoRaWAN  
pink pins → UA residences

# Problem

- Enrich the ATCLL infrastructure in order to improve the lifestyle of citizens and for investigation purposes
- Monitor the number of people at a certain location for statistical purposes
- The Aveiro's Town Hall proposed a task: to monitor the quantity, frequency and the number of passengers of *moliceiros* in the *Ria de Aveiro*



# Goals

- Develop solutions to get values from the sensors
- Develop mechanisms to detect people, *moliceiros*, movement, etc.
- Develop a subscription broker to accumulate past and real time data
- Develop a web application to show the subscription broker's data
- Process data relative to people and *moliceiro's* traffic and display it on the web application
- Improve team-working skills
- Learn how to work with new technologies and equipments

# Tasks

- Architecture planning: All of the team members
- Study all the sensors and detection algorithms and understand which solutions to use: Maria Cunha, Pedro Loureiro, Hugo Leal, Diogo Mendes
- Front end - Web application, dashboard: Luísa Amaral, Maria Cunha
- Back end - Data analysis, integration with front end: Pedro Loureiro, Hugo Leal
- Data acquisition with broker : Diogo Mendes, Luísa Amaral
- Testing all the developed components: All of the team members
- Documentation: All of the team members

# Calendar

	Milestone 1		Milestone 2					Milestone 3				Milestone 4	
	Semana 1 (22 março - 28 março)	Semana 2 (29 março - 4 abril)	Semana 3 (5 abril - 11 abril)	Semana 4 (12 abril - 18 abril)	Semana 5 (19 abril - 25 abril)	Semana 6 (26 abril - 2 maio)	Semana 7 (3 maio - 9 maio)	Semana 8 (10 maio - 16 de maio)	Semana 9 (17 a 23)	Semana 10 (24 a 30)	Semana 11 (31 maio a 6 junho)	Semana 12 (7 a 13)	Semana 13 (14 a 20)
<b>ARRANQUE DO PROJETO</b>													
Estudar wiki e componentes do projeto	Yellow												
Avaliar os sensores existentes	Yellow												
<b>ARQUITETURA</b>													
Planeamento da arquitetura		Blue											
<b>SENSORES</b>													
Desenvolvimento das diferentes interfaces para extrair resultados dos sensores		Orange											
Desenvolvimento do algoritmo de deteção de pessoas		Light Orange											
<b>FRONT END</b>													
Determinar modelo da front end				Pink									
Adaptar front end web application						Light Purple							
Adicionar elementos ao dashboard						Purple				Purple			
<b>AQUISIÇÃO DE DADOS</b>													
Desenvolvimento do broker				Teal									
Aquisição de dados do broker							Cyan						
<b>BACK END</b>													
Familiarização com ferramentas de construção de backend				Red									
Tratamento dos dados								Red					
Integrar com front end							Pink				Pink		
<b>TESTES</b>													
Testes web application										Green			
Testes do broker							Dark Green						
Testes algoritmo de deteção					Light Green								
<b>DOCUMENTAÇÃO</b>													
Documentação de código e arquitetura usada			Gold					Gold				Gold	

# Expected Results

- A web application to present the results obtained in real-time as well as past results
  - Detection of people, *moliceiros* and movements
  - Analysis of the collected data
- Make use of the infrastructure to integrate people and *moliceiros*
- Expand the Aveiro Tech City Living Lab project

# Related Work

- Related thesis
  - mCity: Using smart city monitoring data to characterize and improve urban mobility, from Ana Filipa Simão de Almeida, 2020
- MobiWise
- Spectral Probes
- Radar velocity mapping
- Mobile Stations and Sensors