AQUATIC 2D

students @deti

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Group 4

Miguel Lopes *72385*
Óscar Pimentel *80247*
Fábio Alves *84734*
Sérgio Aguiar *84831*
Daniel Marques *85070*

Mentors

Susana Sargento
Miguel Luís
Daniela Sousa

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Overview

Aquatic 2D's main goal is to mitigate problems related to remote monitoring using data captures from a depth camera in order to correct GPS mistakes and detect obstacles. The data is collected by a group of Aquatic Surface Drones (ASD) and, then, displayed in a dashboard where the user can take advantage from the data provided by the sensors and the camera.

To do so, our main challenge was to incorporate a depth camera in a system to take advantage of its capabilities.
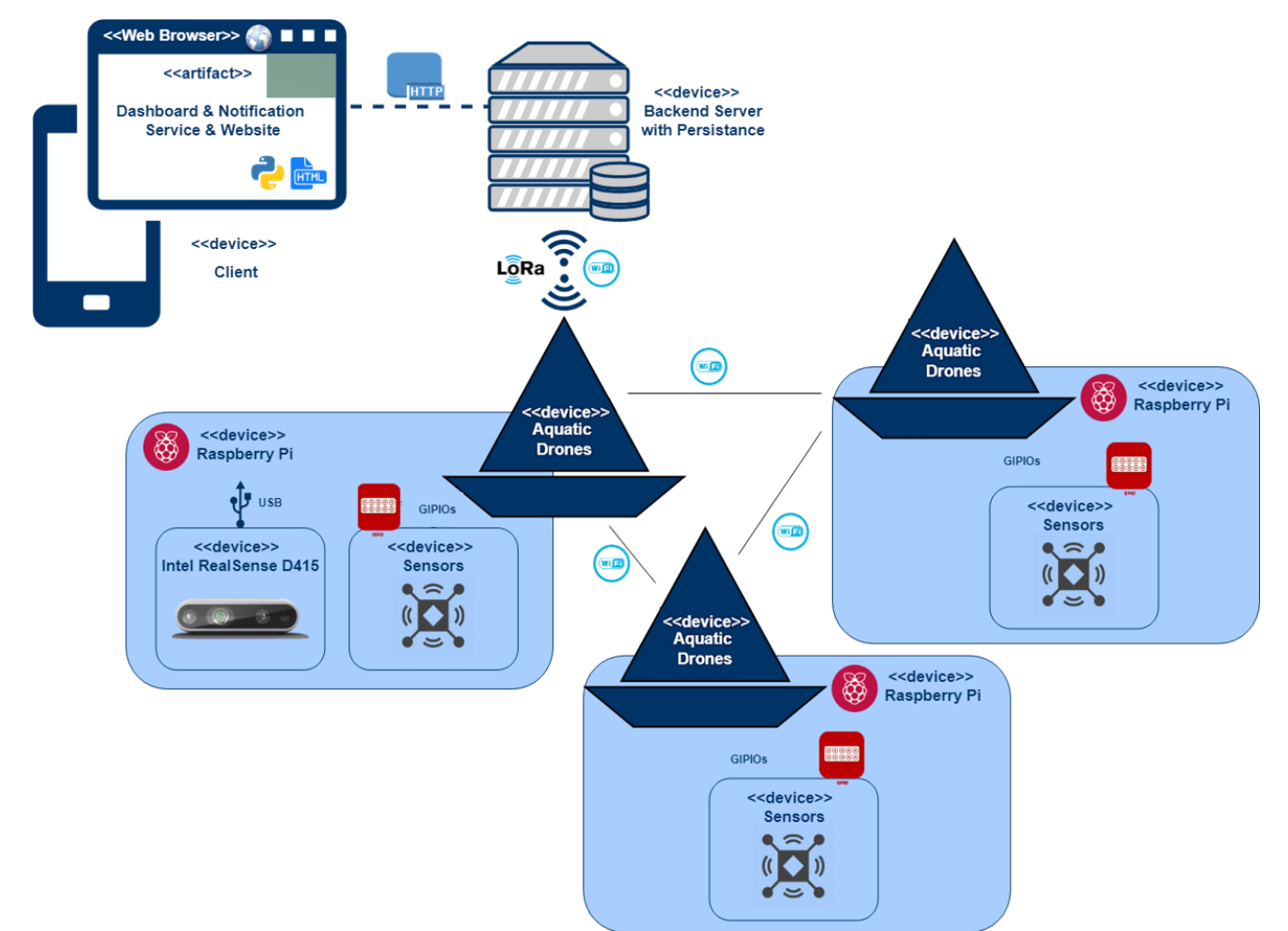

Fig 2- A brief representation of the System Architecture.

Fig 1-.The system performing in real life.

The Problem

With technology rapidly evolving in the world we live in, most of the efficiency problems of the past have been reduced to such a small degree that a focus shift has occurred towards safety.

In this context, there are some activities that can be optimized and made safer by using remote monitoring, like cave exploring or fish farming.

Currently, remote monitoring has some issues, such as high dependency on humans' vision, lack of obstacle detection and inaccurate GPS locations that can lead to environmental data collecting mistakes and equipment damage.

Even though navigation devices such as the GPS are powerful, they would not be fully trustworthy.

The Solution

Aquatic 2D has as a goal of solving of the previously enunciated problems by integrating a camera with a depth sensor in a group of Aquatic Surface Drones (ASD) alongside another technology to verify the data and correct it if needed. This will be done using the data from the camera to validate the geographical positions provided by GPS. This validation will be conducted by calculating the position of entities within the camera's field of vision, knowing the distance at which these entities are from the camera and the camera's position.

Even though errors will still exist with this approach, data fusion will reduce them drastically to the point of being trustworthy.

The project also wants to identify obstacles, allowing for the mapping of the area using the technology explained previously. This will turn the remote activity much more viable and trustworthy.

The amount of data collected either by the camera, and the sensors is then displayed in a dashboard, where the user can take advantage from it.

Among others, our system provides some features like:

- GPS correction;
- Obstacle detection;
- Live feed;
- Dashboard monitoring.

Technologies