IntelChair

M1 - Scope definition and Minimum viable product

Project in Informatics Engineering 2018/2019

Group 7

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- Marcelo Fraga
- Marco Silva
- Miguel Dinis

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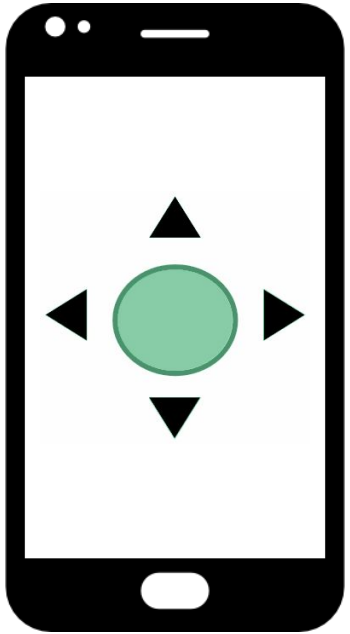
What do we have?

An electric wheelchair controlled with a joystick.

What do we propose?

An autonomous wheelchair that communicates with a web application and gives more options of control to the user than a simple joystick.

How it works



Smartphone

Web application for the user

Wheelchair

PC

Links all system nodes and handles communication

Camera

Object recognition and collision detection

Various Sensors

Room mapping

Personas

Ramalho, 32 years old

- Researcher in a software engineer office
- Has leg paralysis
- Spends most of his time working in a office using his non-assisted wheelchair
- Gets tired by moving his chair by hand

Personas

Rogério, 43 years old

- Investigator at University of Aveiro
- Spends most of his time working in IRIS Lab
- Work on different desks and working stations
- Moves things around the laboratory
- Needs to leave the laboratory to get components

Features

- Manual control of the chair through a joystick in the web application
- Voice control. The user can speak to the web app and control the chair
- Autonomous room mapping done by the chair
- Call the chair to the user’s location
- Have the chair follow the user
- Travel from point A to B. The chair can go from a location to another by itself
- Predefined locations. The user can add default locations to the map

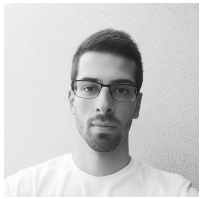
Work distribution

Application Developers

Miguel Dinis

Fábio Alves

Image and Collision Detection



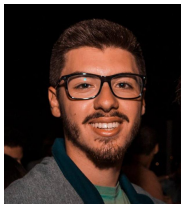
Diogo Marques

Mapping and Communication

Marco Silva

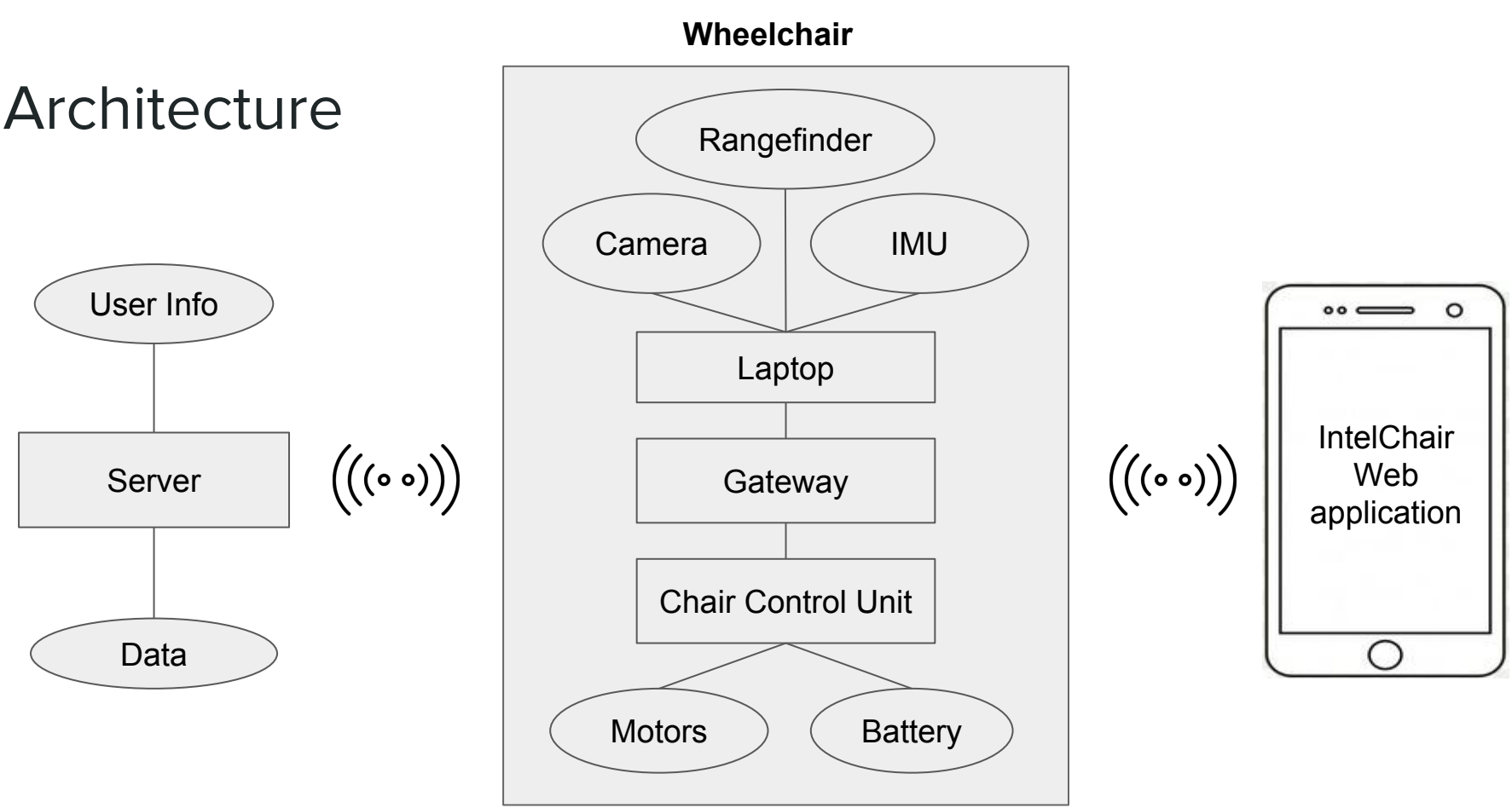
Marcelo Fraga

Server



André Neves

Architecture



Risks and issues

- Hitting something that was not previously mapped by the chair
- Failure of connection between the user and the chair
- Making sure only one user controls the chair at a time
- The elements of the chair may change drastically
- Placing the sensors in the chair so they are functional and not interfere with the user
- The laptop runs out of battery

Test and Validation

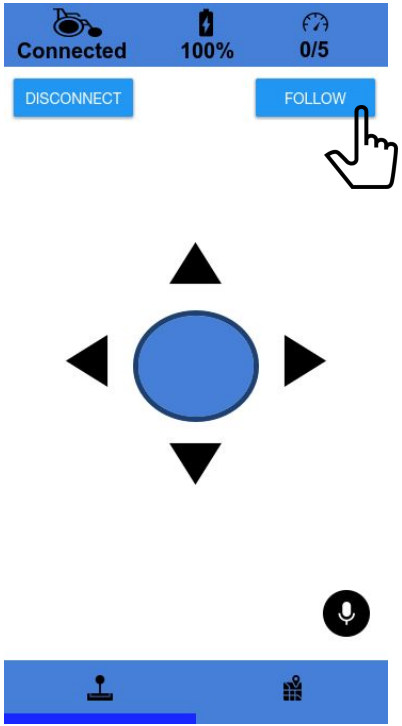
The IntelChair should be able to:

- Respond efficiently to the application commands
- Recognize and respond to voice commands
- Follow the user when commanded to
- Travel from point A to B smoothly without hitting anything
- Saving multiple predefined locations added by the user and travel between them

Visual Concept

Application Mockups

Visual Concept



Visual Concept

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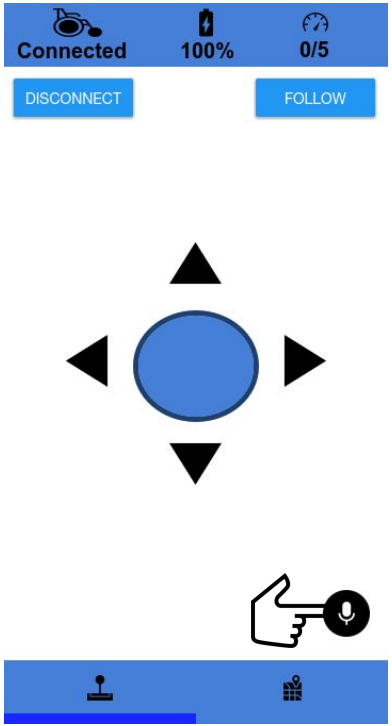

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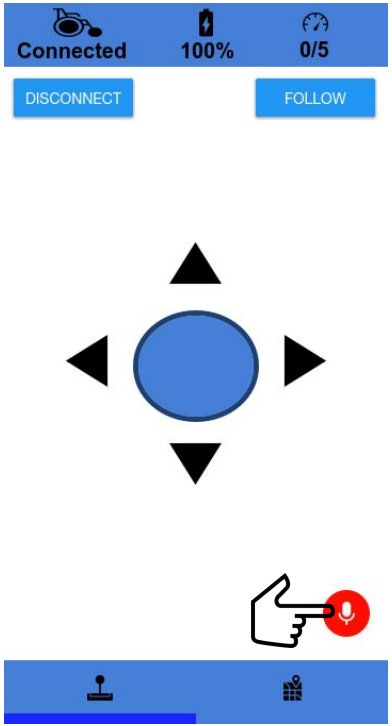

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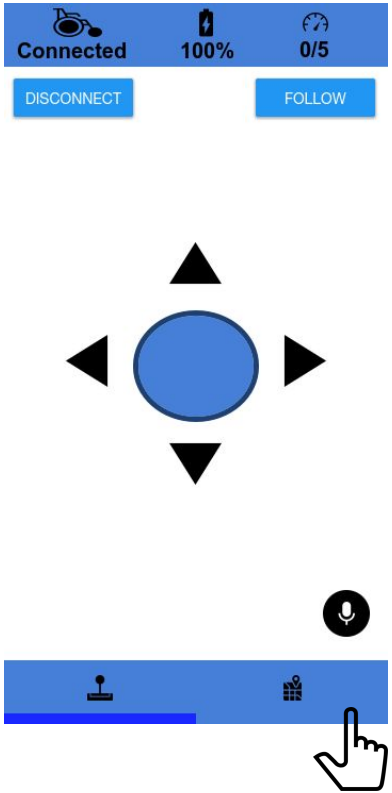

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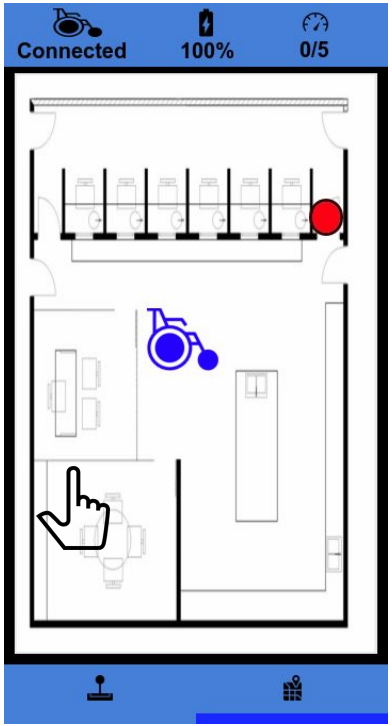

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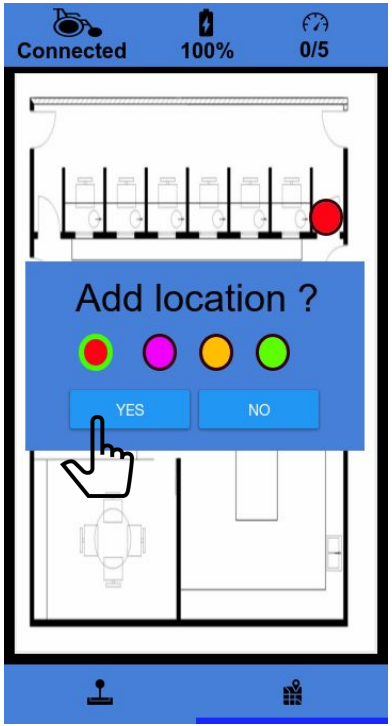

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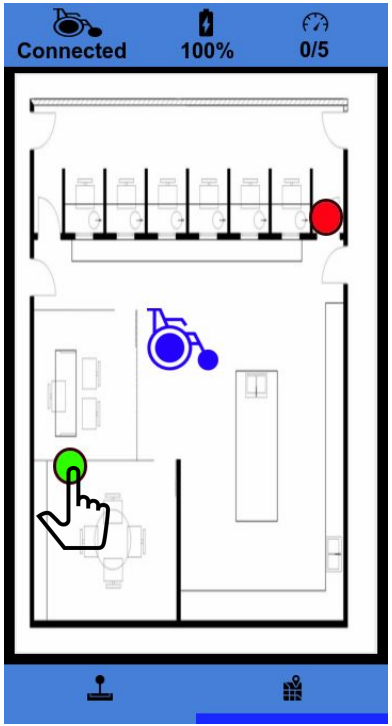

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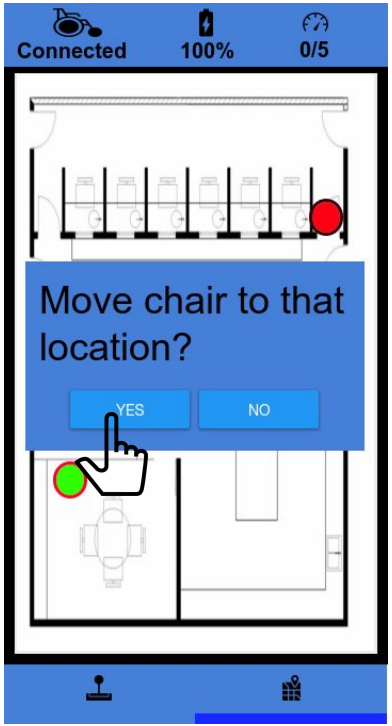

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