

ElectroCap Project Proposal

Vital Monitorization Bracelet

Pedro Lopes

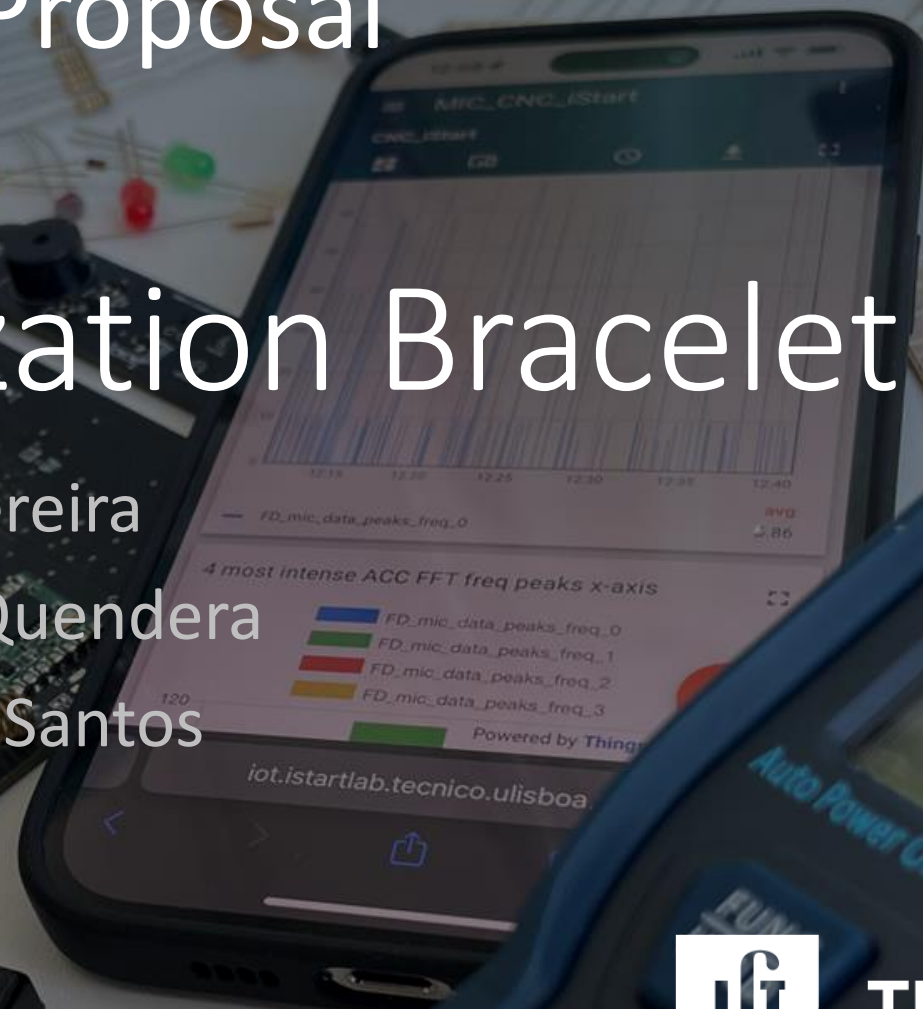
Miguel Pereira

Vasco Martins

António Quendera

Tiago Dias

Bernardo Santos



TÉCNICO LISBOA

1. Advisors and Mentor

- Scientific Advisor: Prof. Teresa Vazão
- Scientific Co-advisor: -
- Coordinator: -
- Mentor: -

2. Problem definition

The issue to be addressed is the lack of monitoring and supervision of vulnerable individuals, especially elderly people living alone, in isolation, or with little social contact.

These circumstances often lead to delayed assistance in accidents such as falls or heart attacks, situations that could easily be prevented through some form of monitoring.

3. Solution beneficiaries

The solution of this project is aimed at elderly individuals living alone, and it can also be applied to anyone with a condition that requires monitoring. Additionally, family members and organizations engaged in such activities will have a tool to do so more easily and frequently.

4. Technological solution

Our multifaceted technical solution involves software, hardware, and digital systems.

In the hardware domain, we are currently evaluating components such as a gyroscope, GPS tracker, cardiac rate sensor, antenna, controller, and battery for optimal functionality. The hardware configuration aims to create a reliable device with features like precise motion tracking, accurate location monitoring, and health data collection.

The software component is focused on creating a user-friendly app that interprets information from the bracelet.

Communication between the app and the bracelet can occur directly or through an external controller. The critical aspect of the project lies in the development of digital systems to detect and translate occurrences into actionable information. This requires meticulous programming to enable the bracelet to efficiently process and analyze data, providing meaningful insights.

5. Competitors and previous work

The current solution to the problem we're trying to address involves manual approaches such as regular visits from family members, authority figures, or organizations. Within vital monitoring solutions, there are two types: smartwatches developed by all major technology companies and bracelets with limited functionalities already targeted at elders. Our product will bring the functionalities of smartwatches but cater more specifically to this age group, considering its comfortable usability and effectiveness.

6. Solution requirements

The bracelet should be comfortable, water-resistant, and capable of withstanding potential falls while featuring a simple interface. Its battery should be long-lasting or easily replaceable to ensure consistent operation. The bracelet should measure all necessary vital data while ensuring the privacy of that information. Operational resilience is crucial, with mechanisms in place to ensure continuous functioning in all situations. Lastly, it should be compatible with areas/homes without internet access and isolated locations.

7. Technical challenges

In the project's implementation, we anticipate that the most challenging aspect will be ensuring that the bracelet is practical, comfortable, and water-resistant since the goal is for it to be worn for extended periods, including during bathing. Ensuring the longevity of the battery life will also be a challenge. Providing an intuitive interface for both the user and the monitor is another important aspect. Implementing a robust and fast communication system that allows the monitor to receive alerts with minimal latency will also be a significant challenge.

8. Partners

Our project currently operates independently, devoid of any formal partnerships or affiliations with external entities. As our project progresses and evolves, we remain open to collaborating with relevant organizations and entities that share our vision and could be of fundamental assistance in achieving our goal. These potential partnerships would be crucial in enhancing the project's capabilities and furthering our collective efforts to solve the challenges posed by the device.

9. Testing and validation metrics

To ensure the integrity of the safety standards of the electronic bracelet, the testing process will involve the participation of several elderly individuals. Each participant will wear the bracelet for a period of time that allows for a comprehensive evaluation of all functionalities in different scenarios. Before the effective implementation of the bracelet, meticulous tests will be conducted for resistance, battery longevity, material durability, and the performance of each individual functionality.

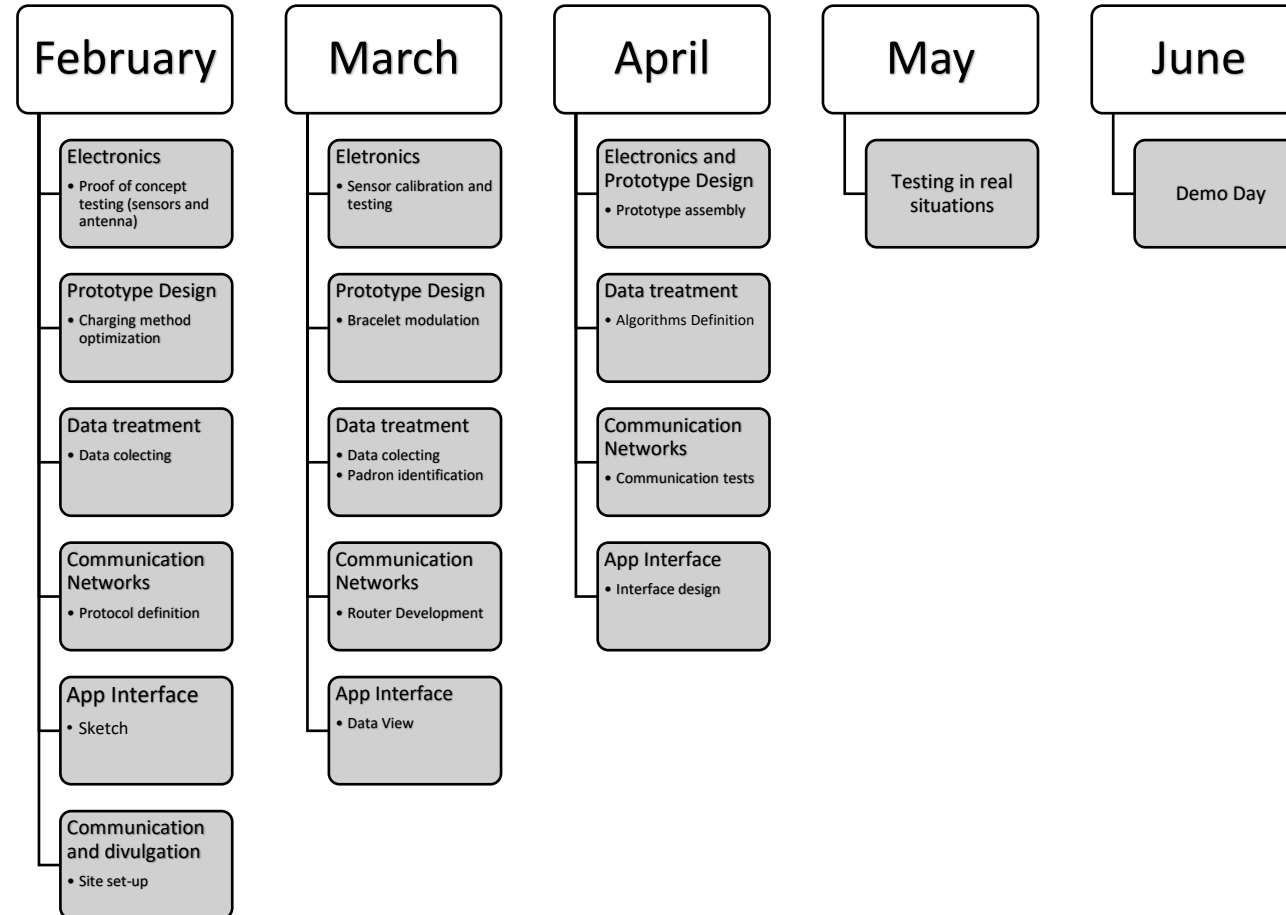
10. Division of labor (I)

Pedro Lopes	Vasco Martins	Tiago Dias
Data treatment	Prototype Design	Electronics
Data collecting	Bracelet Modulation	Sensor's set up
Padron Identification	Charging Solution	Antenna set up
Algorithms Definition		

10. Division of labor (II)

Miguel Pereira	António Quendera	Bernardo Santos
Communication network via the Internet	App interface	Emergency communication network
Protocol Definition	App Design	Protocol Definition
Implementation	Implementation	Implementation
Site deployment		

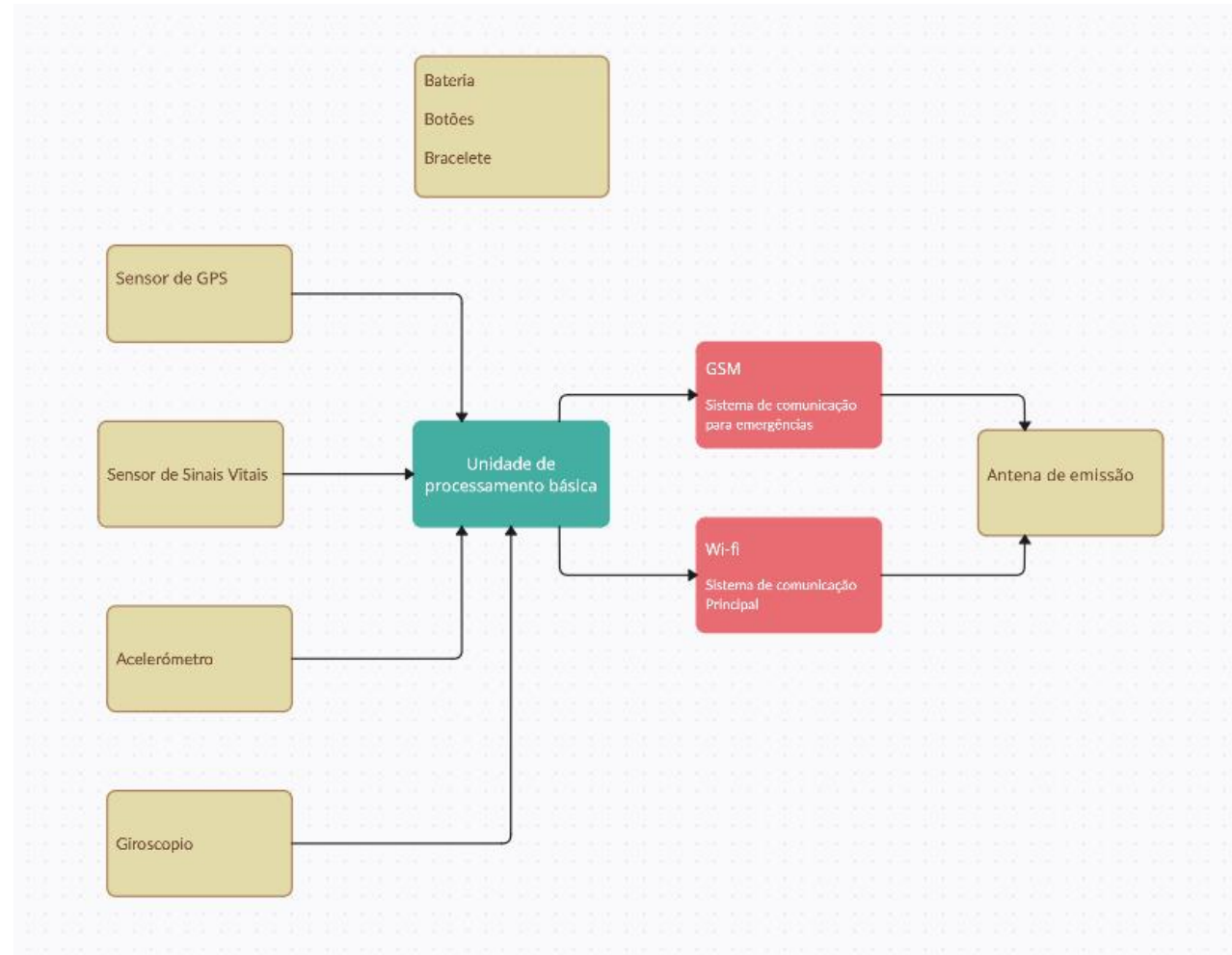
11. Schedule



12. System's Diagram



12. Bracelet's Block Diagram



13. Server's Block Diagram

