Integrative Project In Industrial Electronics and Computers Engineering

Sensoring System for Superficial Sea Streams

5S – Drifter

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Agenda

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- Analysis
  - Requirements and Constraints
    - Requirements
    - Constraints
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  - System Architecture
- Design
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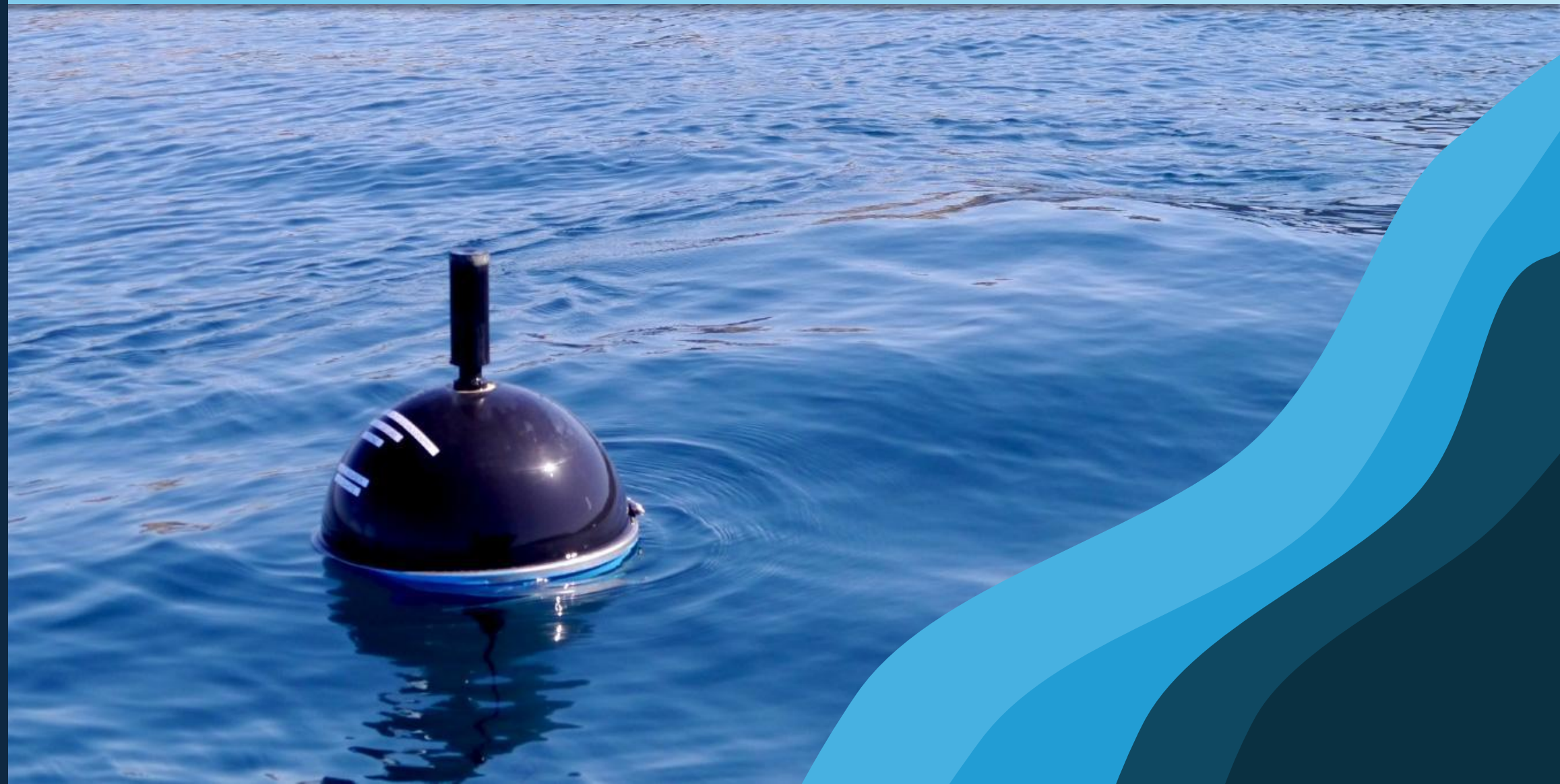
Introduction



Project Statement

The **ocean** is one of the man greatest mystery even before the written history. Humanity made the world ours over the water, from the Portuguese greatests discoveries, braving the raging ocean to the newest oil tanker demanding ever newer technology in order to tame the sea for safer and smoother sailing.

Nowadays scientists believe only **20% to 26%** of the ocean is **discovered** with the actual technology which means that humanity know as much about our so grate sky as our own seas.

5S ocean drifter is a equipment made to acquire date from superficial sea streams and **expand the oceanographic knowledge** about it. Better knowledge of the ocean lead to further development in diverse areas. Granting **safety,security and efficiency** over the blue giant.

Project Statement Analysis

5S, an acronym for Sensoring System for Surface Sea Streams is a low-cost, **low-power** solution to **acquire data** with the focus to last **autonomously** for the longest time possible. The drifter has to attain its **GPS** coordinates in order to track its current and average velocity, alongside with the **water temperature** and a **accelerometer information** to gather information about the **wave intensity**. All this data will be **stored locally** and **transmitted** by a protocol, yet to be defined, with a JSON format in order to be received by a **database** that already is implemented.

Analysis

- Microcontroller
- GNSS and Internet Protocol
- Sensors
  - IMU
  - Temperature
- Batteries

Requirements

- Search and selection of hardware components
  - Low Power and Low Cost
- Software/Hardware design
  - Communication within modules and peripherals
- PCB design*
- Renewable energy*
- 5S outer shell as a 3D design
- Product realization
- Laboratory Tests
- Documentation

* On analysis

Constraints

The project must

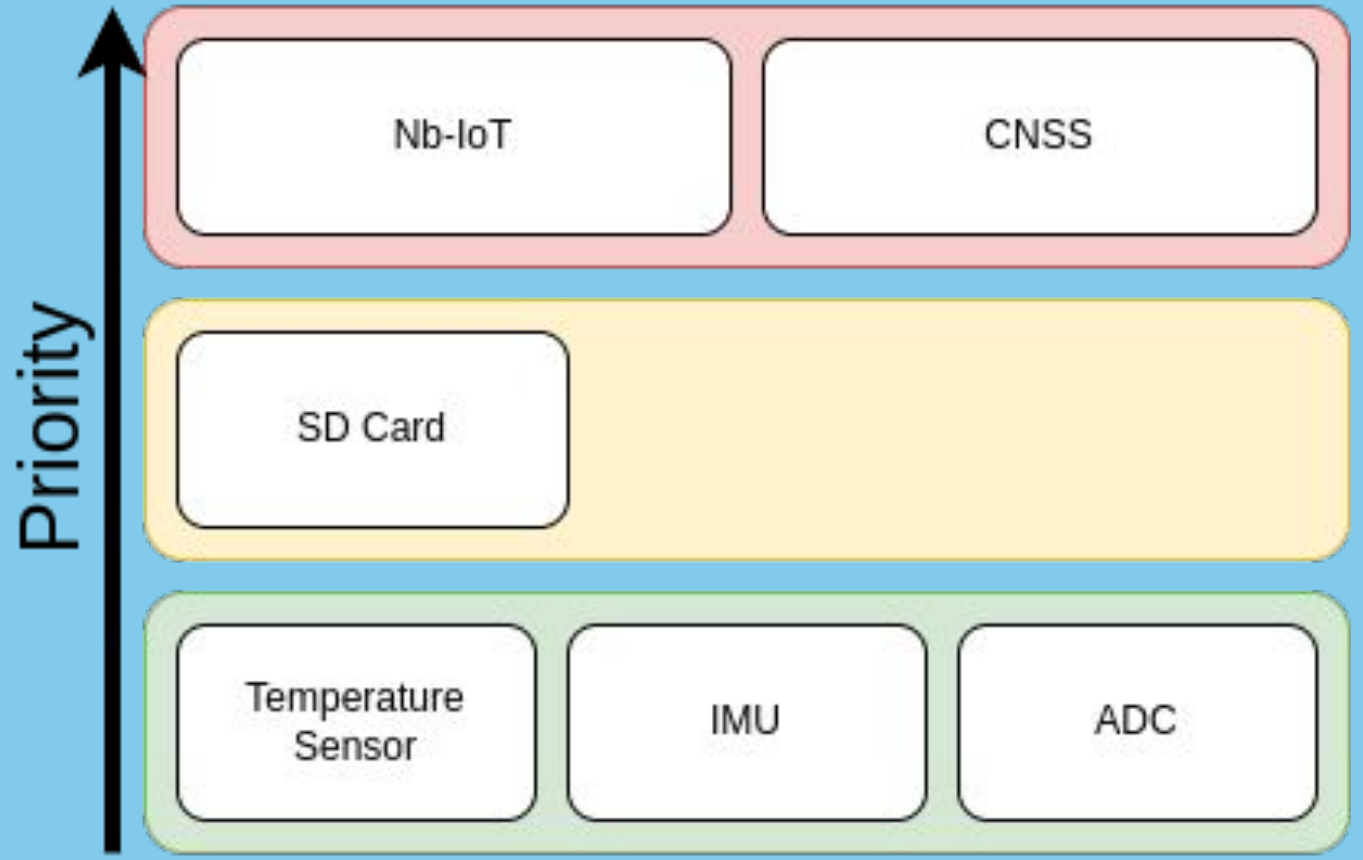
- Be presented for evaluation within deadline
- Be validated at the ocean.
- Have an autonomy of a month at minimum
- Due to the low power consumption and lab availability, an STM32 will be used.

State of Art

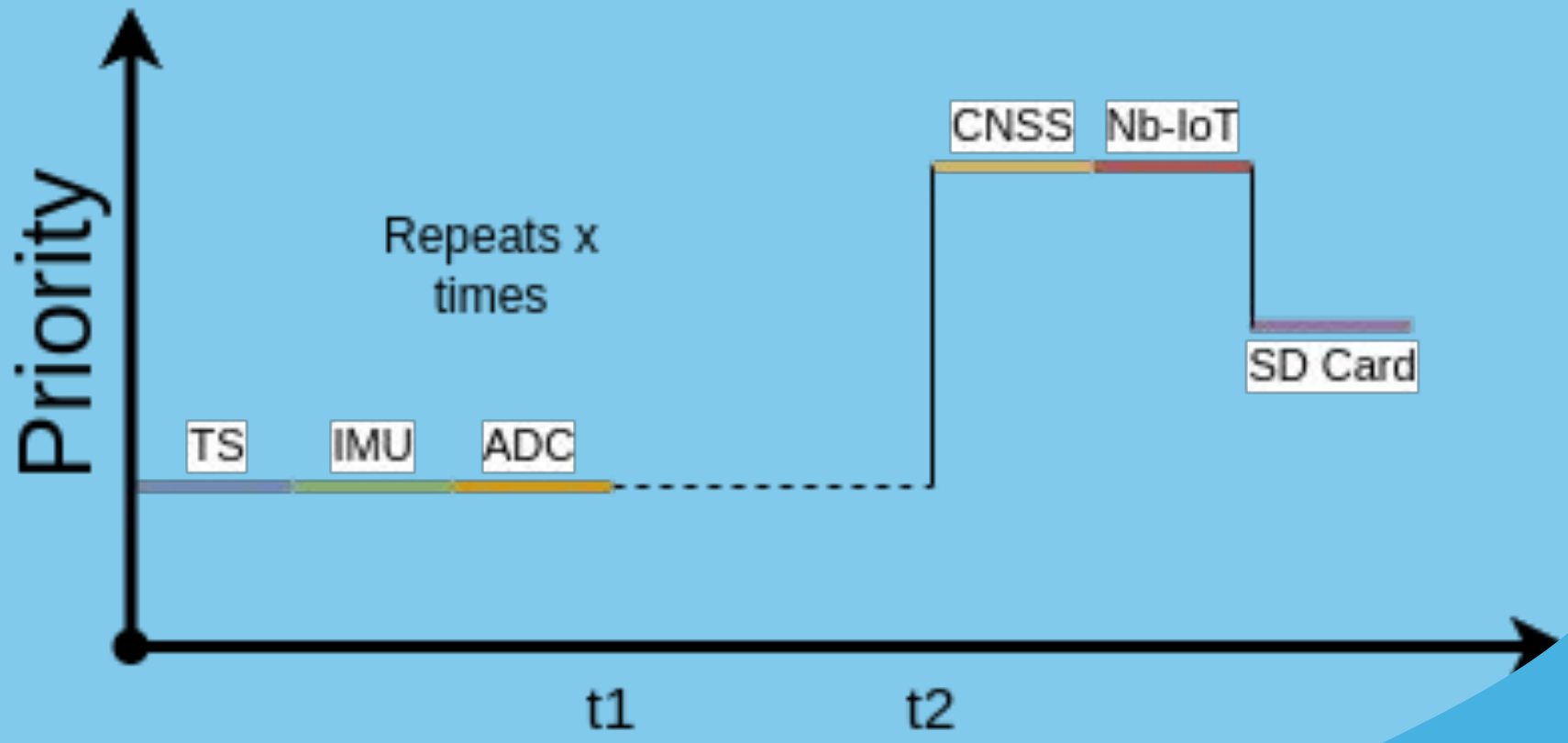
State of Art

- Border Control
- Climate Modeling
- Traffic management
- Aquaculture management
- Public oceanographic research
- Marine spatial planning
- Defense and security

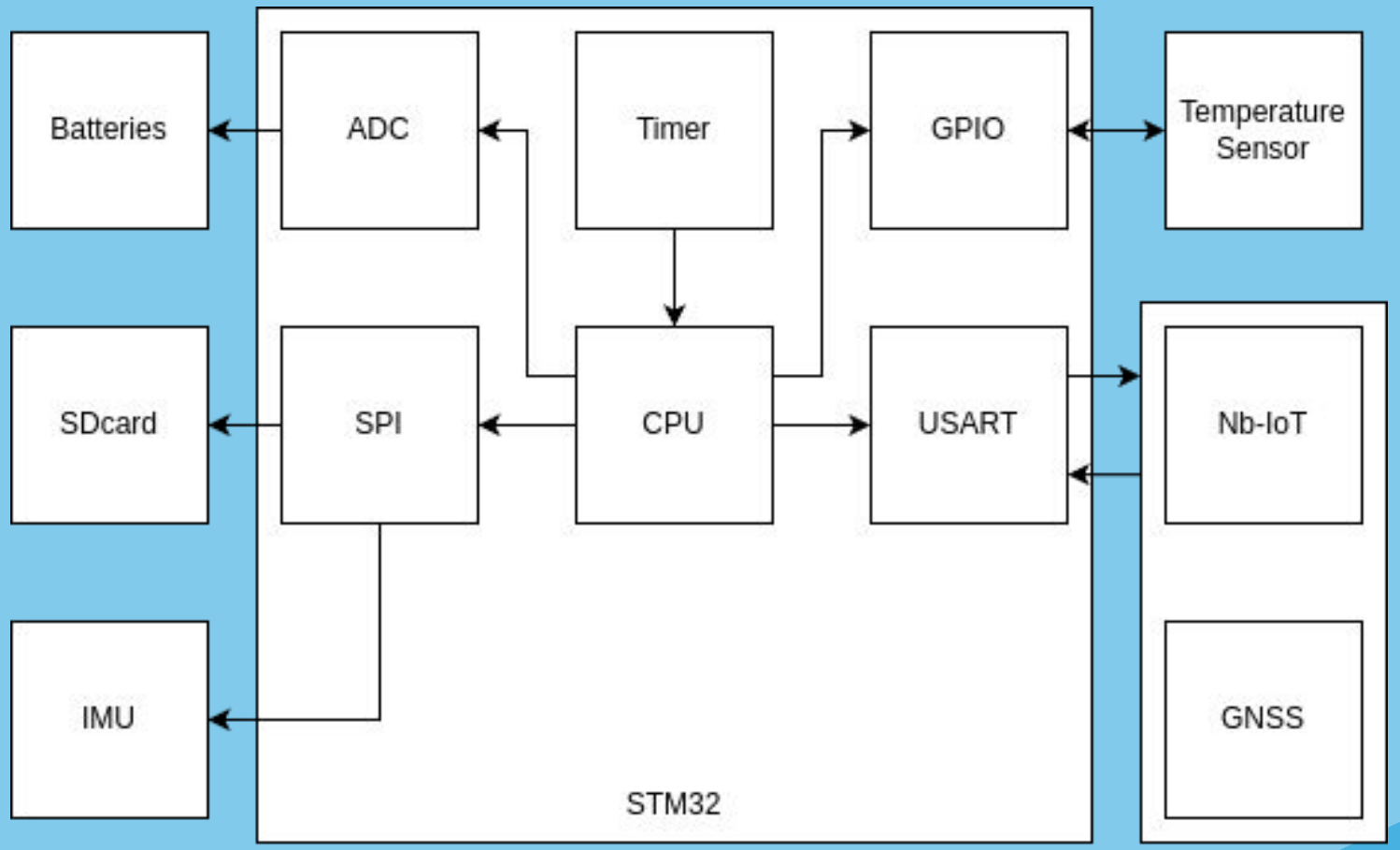
System Architecture



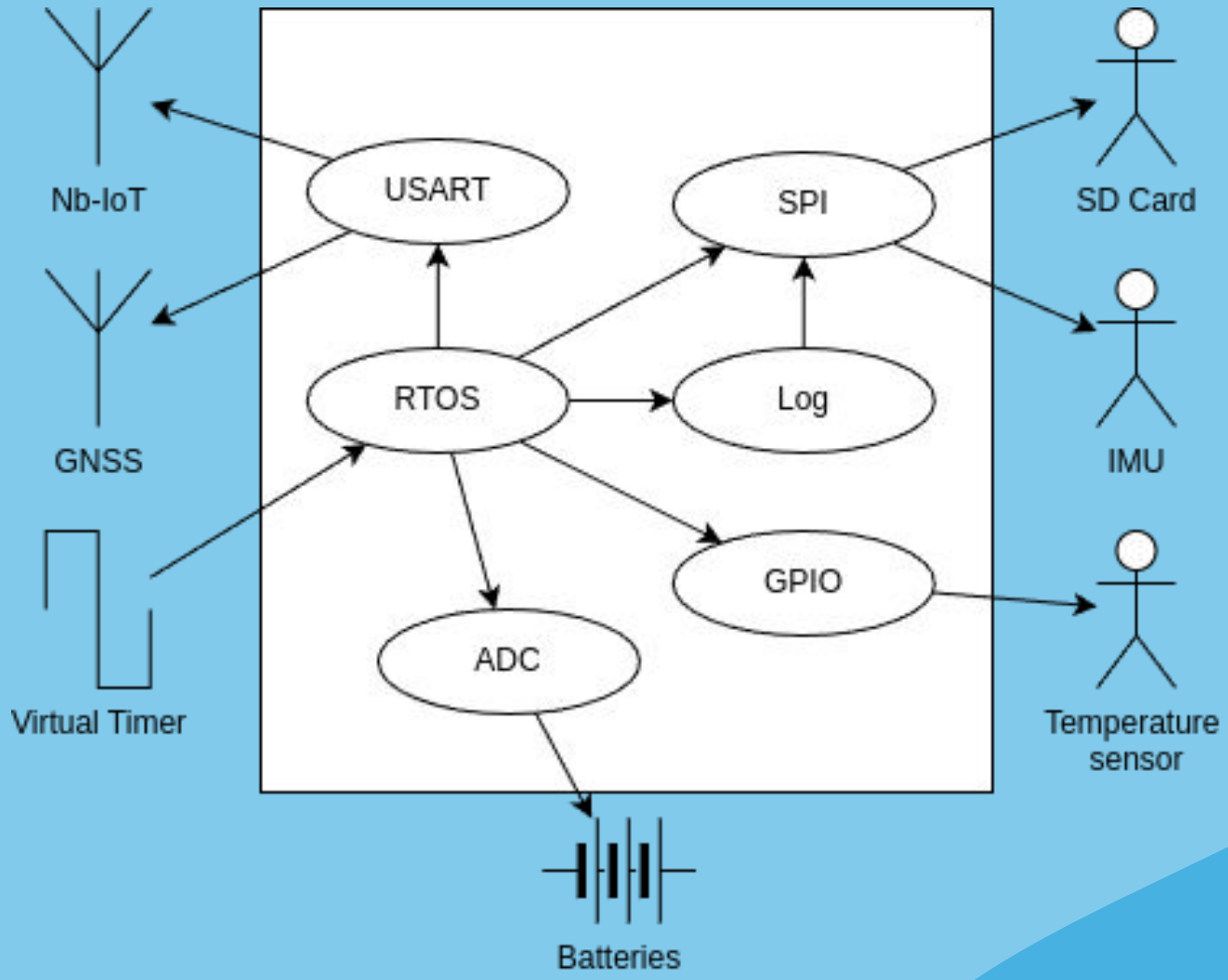
System Architecture



System Architecture



System Architecture



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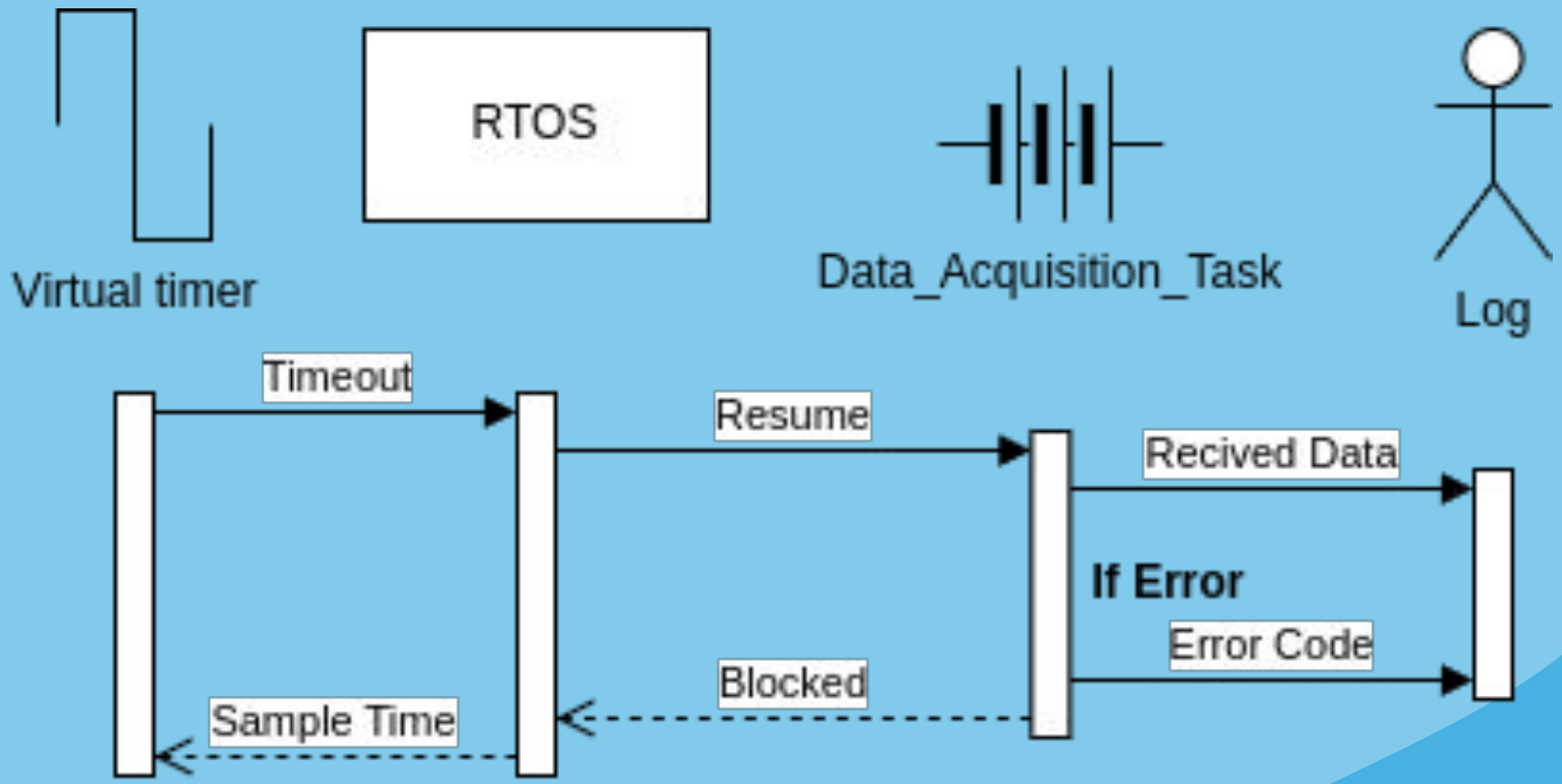

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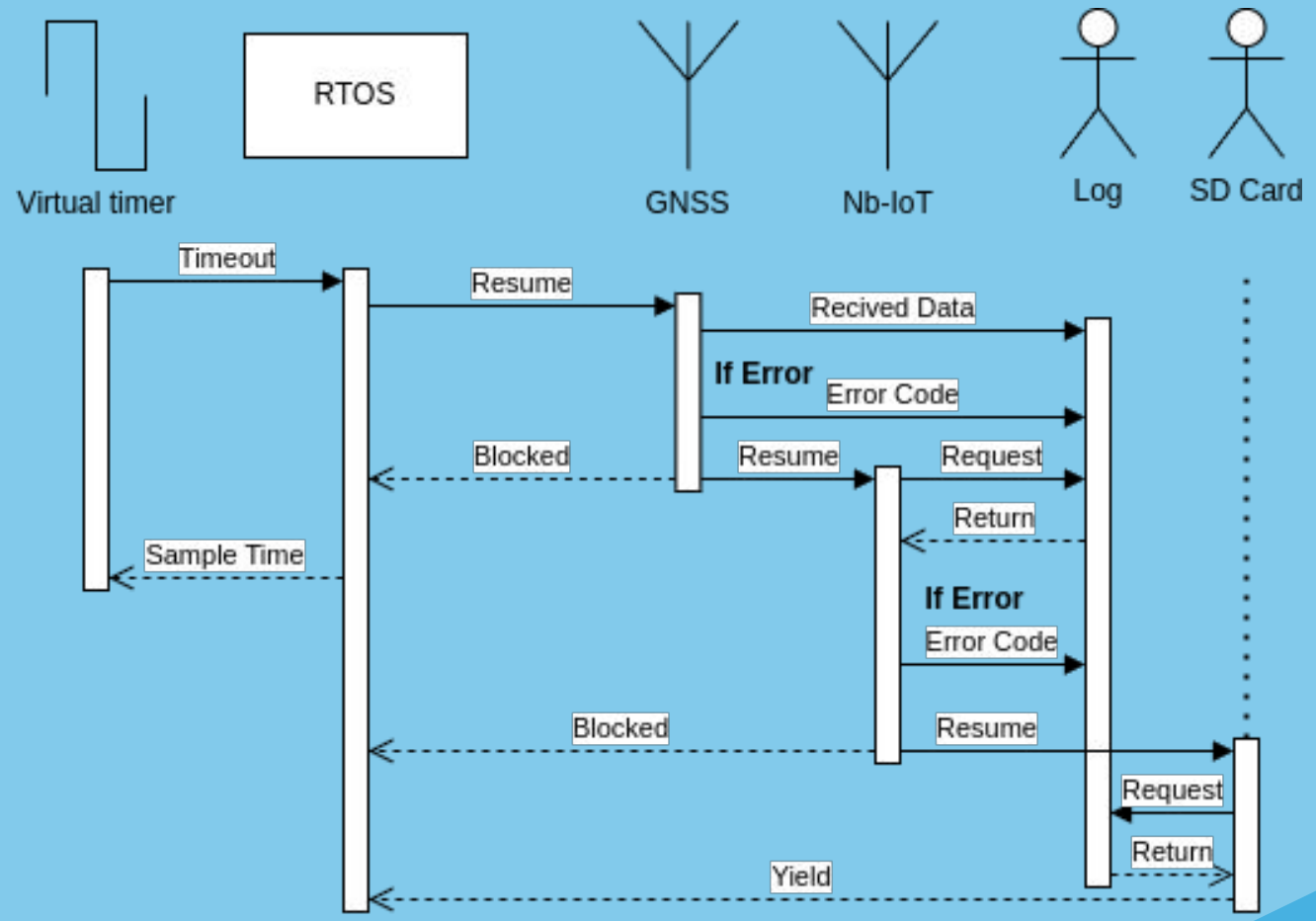

Design

- Microcontroller: STM32
- GNSS and Nb-IoT: ST87M01 evaluation kIT
- Sensors
  - IMU: ISM330BX
  - Temperature: DS18B20
- Batteries
  - Solar energy
    - Controller: AEM10941
    - Panel: SM111K06L
  - Batteries:

Design

Implementation

Thanks :D

Any questions?