



# Project: Solar Boat



# Project Solar Boat: Architecture



**client**

data

control actions



**server**

**WI-FI  
LTE  
NB-IoT  
HaLow  
LoRa**



# Project Solar Boat: Main Tasks

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## System design

- Hardware architecture
- Software architecture

## Data Acquisition (Boat)

- Simulation
- From sensors
- From webcam

## Communication (Boat – Server)

- Transmission & reception
  - ✓ Data
  - ✓ Control
- Performance Evaluation
  - ✓ Parameters selection
  - ✓ Parameters measurement
  - ✓ Benchmarking

## Data processing (Server)

- Data monitoring
- Control algorithms



# Project Solar Boat: Sprints

- Simulated data
- Use Wi-Fi
- Implement basic server
- Basic performance evaluation
- Get real data from sensors

Basic prototype

1

- Sensor data communication: try different IoT protocols (DDS, MQTT, Zenoh, COAP, self-design, ...)
- Get data from webcam
- Video streaming: try different solutions
- Performance evaluation

Data Communication

2

- Try different technologies: Commercial LTE, NB-IoT
- Performance evaluation
- Benchmarking
- Provide a basic control board (visualize streaming and sensor data)

Extend wireless communications (1)

3

- Try different technologies: Private LTE, LORA
- Performance evaluation
- Benchmarking
- Improve control board

Extend wireless communications (2)

4

- Try different technologies: Wi-Fi HaLow, BLE
- Performance evaluation
- Benchmarking
- Improve control board

Extend wireless communications (3)

5

- Define thresholds
- Define & raise alarms
- Send control actions (automatically & manually)
- Provide a full control board

Include control actions + Improve usability

6

- Final prototype
- Final demo
- Project presentation

Project evaluation

7



# Project Solar Boat: Raspberry Pi Info

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- RaspberryPi:
  - Setup:<https://docs.emlid.com/navio2/configuring-raspberry-pi>
  - Programming:Python + C

# Project Solar Boat: Scrum

