

IoT Labs: Projects Proposal

1. Global Outcomes

- Analyze the constraints of an LPWAN based on LoRaWAN
- Deploy an end-to-end IoT service over LoRaWAN
- Design the different components of an end-to-end IoT chain
 - Physical interface of an IoT device
 - Control and actuation
 - Data storage, visualization, and analytics

2. Requirements and Constraints

- Use the ESIB LoRaWAN platform
- Provide working code and proof of concepts
- Provide technical documentation

3. [CO] Connecting the Platform

- Describe and analyze the basic steps for sending and receiving data over LoRaWAN: [IoT Labs: Exploring LoRaWAN](#)

4. [PO] Projects Proposal

4.1 LoRaGreen: Smart Classroom

- Design and implement an end-to-end IoT service
 - Detect, transmit, store, and visualize
 - Classroom occupancy
 - Classroom lighting and temperature
- Analyze and correlate occupancy and lighting

4.2 LoRaMarathon: Live GPS Tracking

- Design and implement an end-to-end IoT service
 - Detect, transmit, store, and visualize
 - GPS position of device
 - RSSI level
- Track device on a dynamic map

4.3 LoRaBot: Device Configuration via Messenger

- Design and implement an end-to-end IoT service
 - Tune radio parameters (SF, transmit period, sleep, etc.)
- Use a messenger robot to interact with device

4.4 LoRaPark: Parking Counters

- Detect, transmit, store, and visualize
 - Car entrance and exit of parking
- Make data available on a messenger robot

5. Available Resources

- Devices
 - Arduino Mega with LoRa Dragino Shields
 - Raspberry Pi with LoRa and GPS shield ([GPS shield](#), [LoRa on Raspberry Pi](#))
- Sensors: Temperature, light, Infrared ([PIR](#)), moisture
- Scripts
 - MQTT python examples
- Visualisation
 - [emoncms](#)

6. Assessment and Grading

- Assessment
 - 1 Common outcome
 - 1 Personal outcome
- Technical tutorial on Wiki
- Oral presentation of achievements
 - Accomplished
 - Exceeded

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Last update: **2021/08/28 09:54**

