LoRa

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Problem Domain

- LoRa(Long Range) has a low bandwidth capacity, which allows for long range, but small payloads. Cannot send large files effectively.

Proposed Solution

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- Understand the **limitations** of **LoRa** in **multiple** different **network settings**.
- Create a **highly distributed** system of **LoRa transmitters** and **Receivers**

Architecture

System Overview

Key Components:

- **ESP32 Micro Controller**: **Brains** and main component running software
- **LoRa Tx/Rx**: Transmission and reception devices

Sprint Structure - Sprint 1

Goals

- Simple **LoRa P2P network**
- Understand LoRa's **Spreading Factor** and **Bandwidth**

Tasks

1. Understand how to make a **simple LoRa network** with **complete payload reception** and **transmission**
2. Push it to it's limits - **understand** the **limitations** of the devices (Bandwidth, range)
3. Create **evaluation matrix** for **combinations** of **Spreading factor and bandwidth**.

Sprint Structure - Sprint 2

Goals

- LoRa **Mesh network** creation
- **Parelleization** of **Transmission and reception**

Tasks

1. Create a more **complex network** of **LoRa devices**
2. Understand **LoRa mesh limitations**.
3. **Spreading Factor** and **Bandwidth evaluation** (For Mesh)
4. **Distribute transmission** and **reception** to begin parallelization of Tx and Rx

Learning with AI

AI Integration

1. **Serialization** and **Parallelization** in **wired connections**.
2. Learning C/C++ with AI for **effective** programming of micro-controllers

Questions?

Thank you for your attention!