

# **Tracking player in a game-field**

**Internet of Things Project**

**Elias El Yandouzi & Lucas Chaloyard**





# Gather all the game

**Project's motivation**

# Ultra-wide band

**Enable precise localisation**

# Bluetooth Low Energy

**Much less accurate**

# Let's have a closer look

Technology	Ultra-wide band	Bluetooth low energy
Location accuracy	< 20 cm	< 5 m
Range	Up to 100m	Up to 200m
Frequencies	2.4 GHz	3.1 - 10.6 GHz

# A point about schedule

From thinking to demonstration

3-ish months project

November

January





# A point about schedule

## From thinking to demonstration

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- Thinking and design

# A point about schedule

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- Thinking and design
- Research and implementation

# A point about schedule

## From thinking to demonstration

3-ish months project

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- Thinking and design
  - Research and implementation
  - Test and debug

The Qorvo logo is written in a bold, black, lowercase sans-serif font. A small trademark symbol (TM) is located at the end of the word.The LoRaWAN logo features the word "LoRa" in black and "WAN" in blue. To the left of the text is a blue icon consisting of four concentric, slightly curved lines representing radio waves. A registered trademark symbol (®) is at the end.

# Thinking and design

**Portable Devices**

**Localisation using triangulation**

**Web application to visualise  
data**



# Research and implementation

Make embedded cards  
communicate

Triangulation using RSSI

Push to and fetch from server





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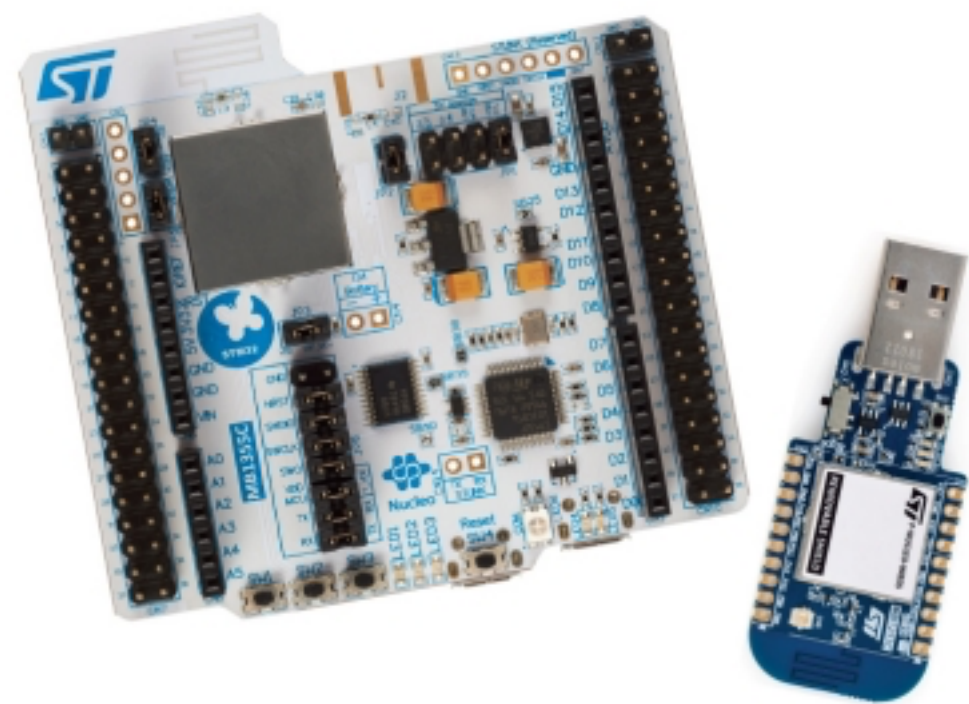
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# Provided equipment

## Embedded cards



Tags and anchors - BLE only

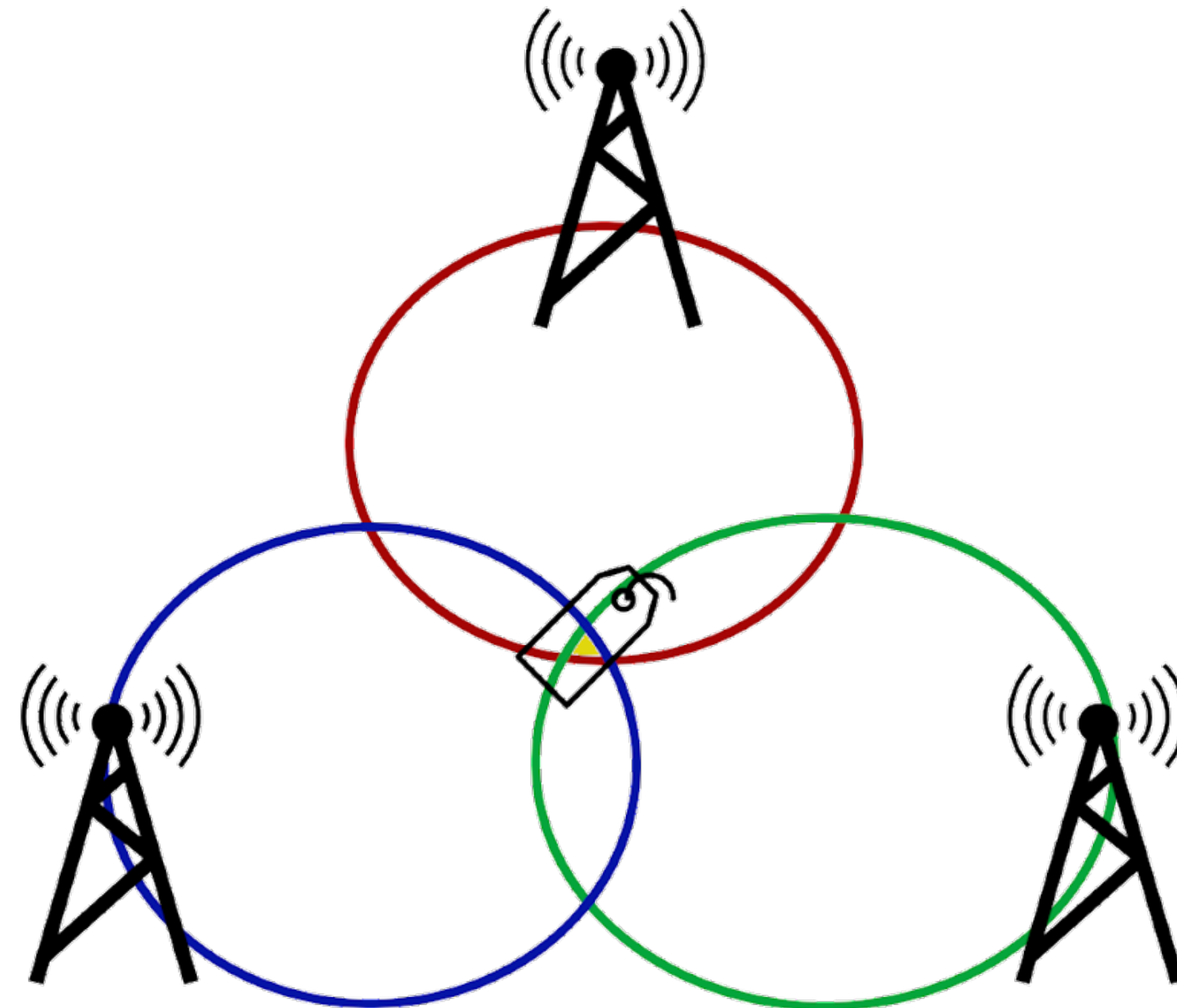


Gateway - BLE and LoRa



# A focus on locating tag

Position estimation using triangulation



# RSSI? What do you mean?

## Received Signal Strength Indication

$$d = 10^{\frac{RSSI(d_0) - RSSI(d)}{10 \times n}}$$

Estimating the distance

$$n = \frac{RSSI(d_0) - RSSI(d)}{10 \times \log\left(\frac{d}{d_0}\right)}$$

Auxiliary formulae