LoRaWAN based IoT cloud systems for SAW droplet control

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Background

- Surface Acoustic Waves (SAW) to manipulate droplets with application to biosensing
- Internet of Things (IoT) connectivity to SAW droplet control

Objectives

- Automated liquid surface analysis and control using SAW
- Secure data transfer and storage
- Visualisation and classification of samples
- Data mining and AI to classify measurements
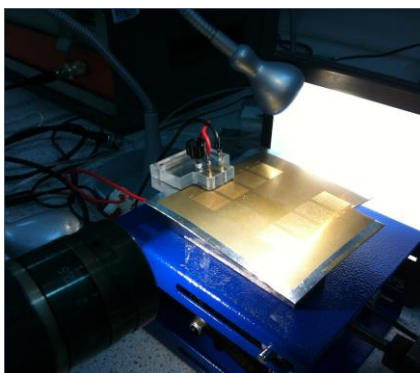
Methodology

IoT platform using open source electronics

- Gateways collect data
- Data transmission to databases/data center in secure cloud
- User interface
- Accessible by other client devices with mobile APPs.

Functions

- Generate time series from measurements
- Data processing
- To help with prediction and classification of new samples

Liquid surface control with SAW

LoRaWAN capabilities:

- long-range coverage
- low-power consumption
- low operation cost
- It is one of the Low-Power Wide Area (LPWAN) communication protocols.

Temperature & Humidity

Light Intensity

LoRa Node

Moisture
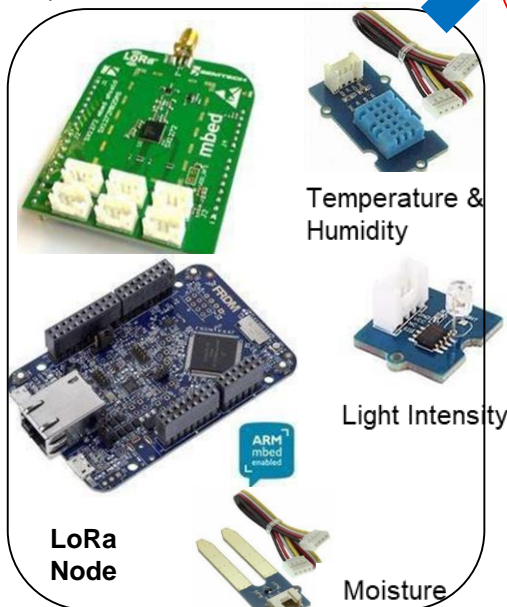
Inputs

- Data arrays, images and videos
- Raw data for processing
- Sensing environment (temperature, humidity…)

In the future work:

- Feature selection
- Pattern recognition
- Auto classification for new samples
- Embedded at the Edge

IoT platform

Gateway

IoT Server/Network Service

THE THINGS NETWORK

AllThingsTalk

AllThingsTalk

API

Digital Health

Acoutofluidics

Personal medicine

Big Data

Artificial Intelligence