



I-ADVANCED INTERNET OF THINGS NETWORKING LAB
6000FTIIOT

Project Proposal: RF Survey Toolkit

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November 13, 2017

1 Problem Statement

A major concern in wireless networks is the coverage and link quality between devices. While LPWAN technologies aim to improve this, they can still struggle with large distances and busy metropolitan areas. With RF signal propagation being such a complicated issue, it is nearly impossible to decide if a certain technology will properly work when trying to calculate or simulate this without on site testing.

2 Goals & Approach

The goal of this project is to make a device which is able to test the wireless coverage and link quality of several wireless networks. This will be done by making an RF survey toolkit. This device will have LPWAN connectivity, and will periodically send messages and test the reliability and quality of the link. The user has to move this device in the environment that is to be tested. After this testing, the data which is logged can be requested by a smartphone over a BLE link. A sketch of this device is shown in Figure 1.

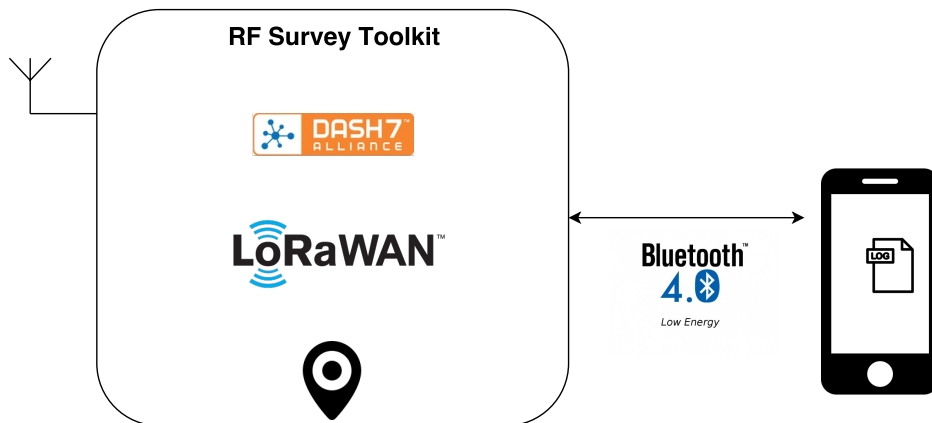


Figure 1: RF Survey Toolkit Sketch

The hardware used for this project is a nucleo development board, combined with a B-L072Z-LRWAN1 discovery board used for wireless communication. Software development will be done using the mbed platform. An android application will be written in Android Studio, which is able to receive data from the Survey Toolkit.

This project will combine the embedded hardware and software knowledge from the Ambient Intelligence course with the IoT Communication protocol knowledge from

the IoT Communication protocol course. The experience of working with the nucleo boards for Ambient Intelligence and my master's thesis and the LoraWAN discovery board for my summer job at the university will definitely come in handy.

2.1 Proposed Schedule

Week	Task
Week 7	Write project proposal
Week 8	Get familiar with hardware & mbed platform, prepare presentation
Week 9	Start testing wireless technologies
Week 10	Finalize RF Survey Mbed code
Week 11	Create an android application, prepare final presentation
Week 12	Start writing the final report
Christmas Break	Finalize the final report

Table 1: Proposed timing schedule.

3 Possible Applications

This device can be used in the future to test the usability of different wireless technologies in certain areas. This allows developers to make an advised choice of wireless technology before starting the development of the product. The device can also be expanded with new wireless technologies, allowing these to be tested without the need to create an entire new toolkit.