

Localization using SDR in ORBIT - Week 3

Rahul Hingorani, Vineet Shenoy, Karan Rajput

Introductions (again)



Rahul



Vineet



Karan

Introductions (again)



Rahul



Vineet



Karan

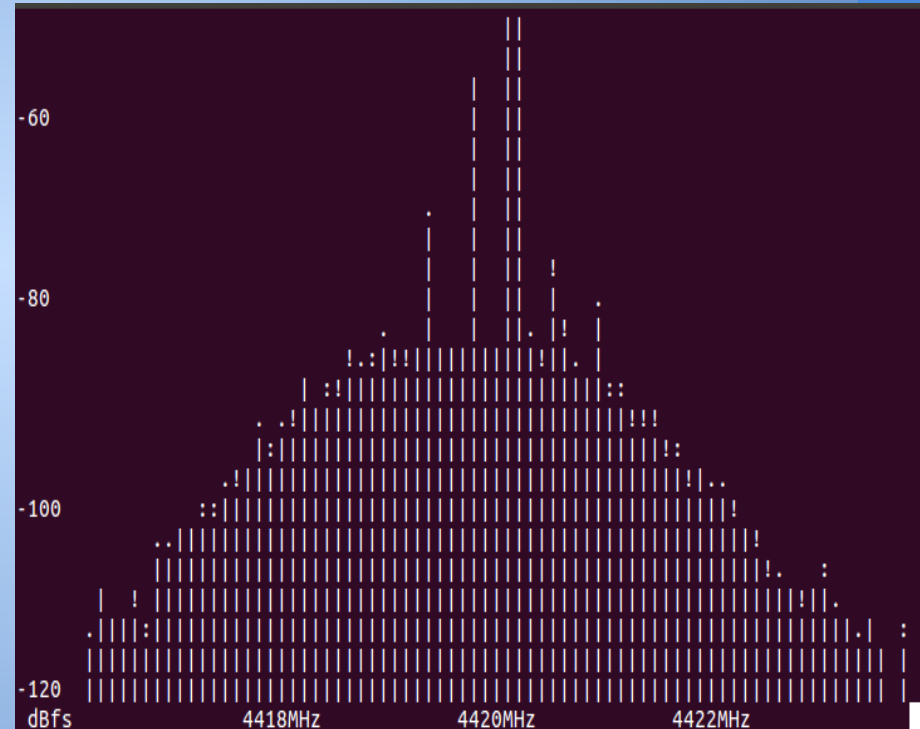
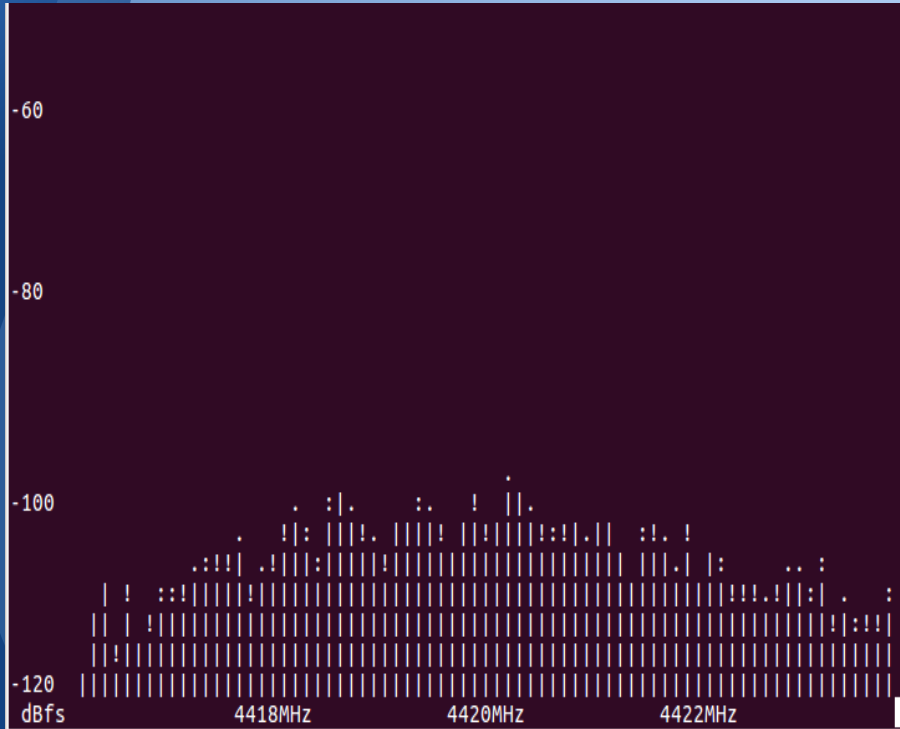
Project Overview

- Problem: GPS localization signal weaker indoors
 - No accurate, cost-efficient solution to indoor localization
- Studying ways to track the location of a transmitter to centimeter level accuracy

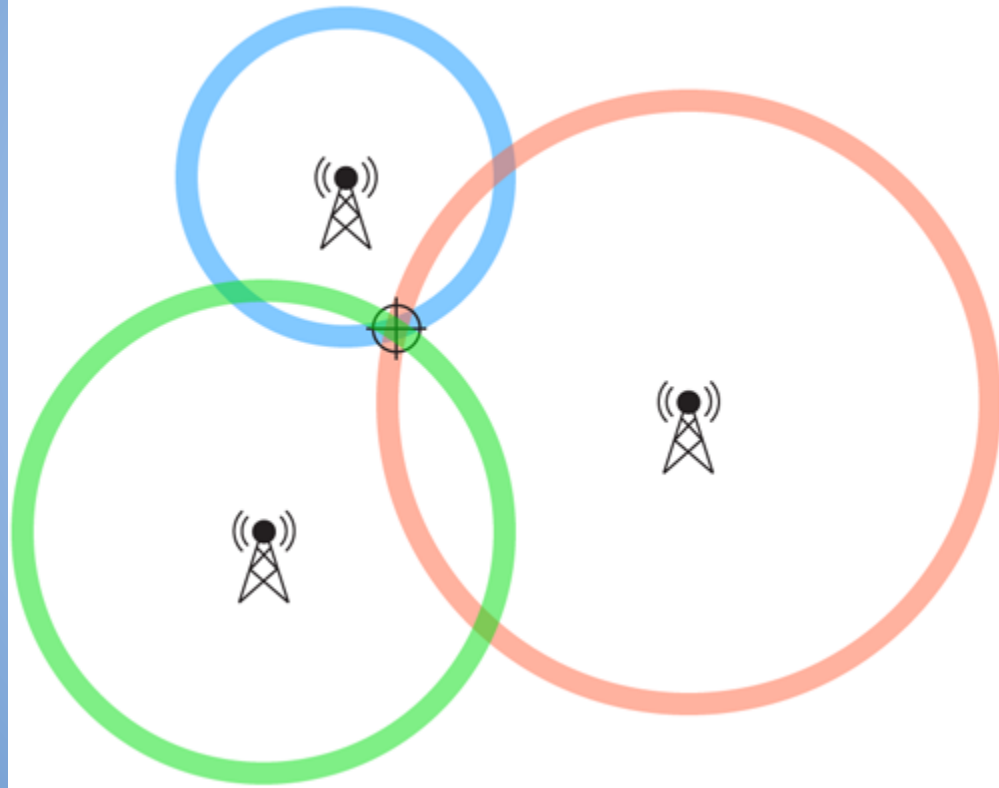
Learning About Devices

- Universal Software Radio Peripheral (USRP) - Software-defined radio (SDR) that can transmit and receive signals
 - Already installed in ORBIT nodes
- GNU Radio - Software that handles all the signal processing in SDRs

Transmitting/Receiving Signals



Range-Based Triangulation



Current Week's Accomplishments

- Attended digital signal processing tutorial
- Consolidated on an overall approach → range based triangulation
- Went through ORBIT tutorials to learn how to transmit and receive a signal and familiarize ourselves with USRPs and GNURadio

Next Week's Plans

- Work on obtaining I/Q samples for a transmitter
 - Goal: Three access points
- Learn how to calculate the power of the signal from the I/Q samples to help quantify the distance away the transmitter is from each access point
- Continue conducting research on indoor localization methods and algorithms