TREASURE HUNT - RF EDITION

PROJECT FOR ADVANCED TOPICS IN COMPUTER NETWORKS

TEAM B

DALLAS DIMITRIS 2412

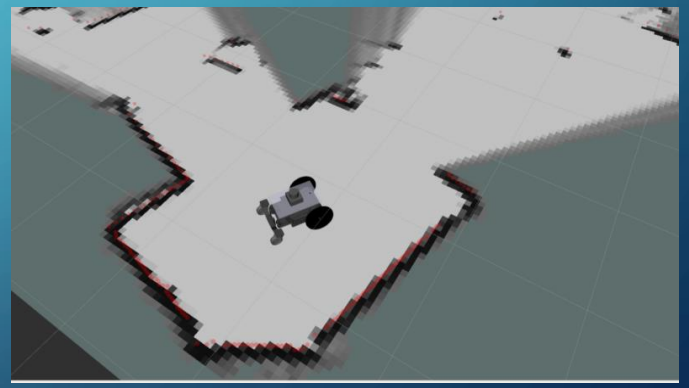
MAROULIS MANOS 2465

INTRODUCTION

- Find the Transmitter in the room based on RSSI
- Present a spectrum heatmap based on the recorded data.
- Equipment
  - 2x Adalm-Pluto SDR
  - 2x Raspberry Pi
  - Unmanned ground Rover
  - RP-LiDAR A1-M8
  - Handmade directional antenna

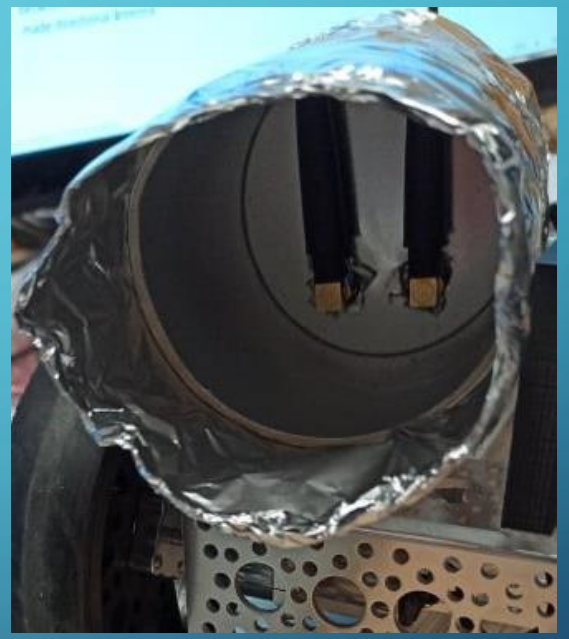
TOOLS

- What is ROS
- Mapping procedure
  - RP-LiDAR A1-M8, range finder sensor
  - SLAM algorithm
- Coordinates and goal
- Recovery behavior
- What is SDR and RSSI
  - AD9364 RF chip, 70MHz -6GHz
- Python APIs for libiio



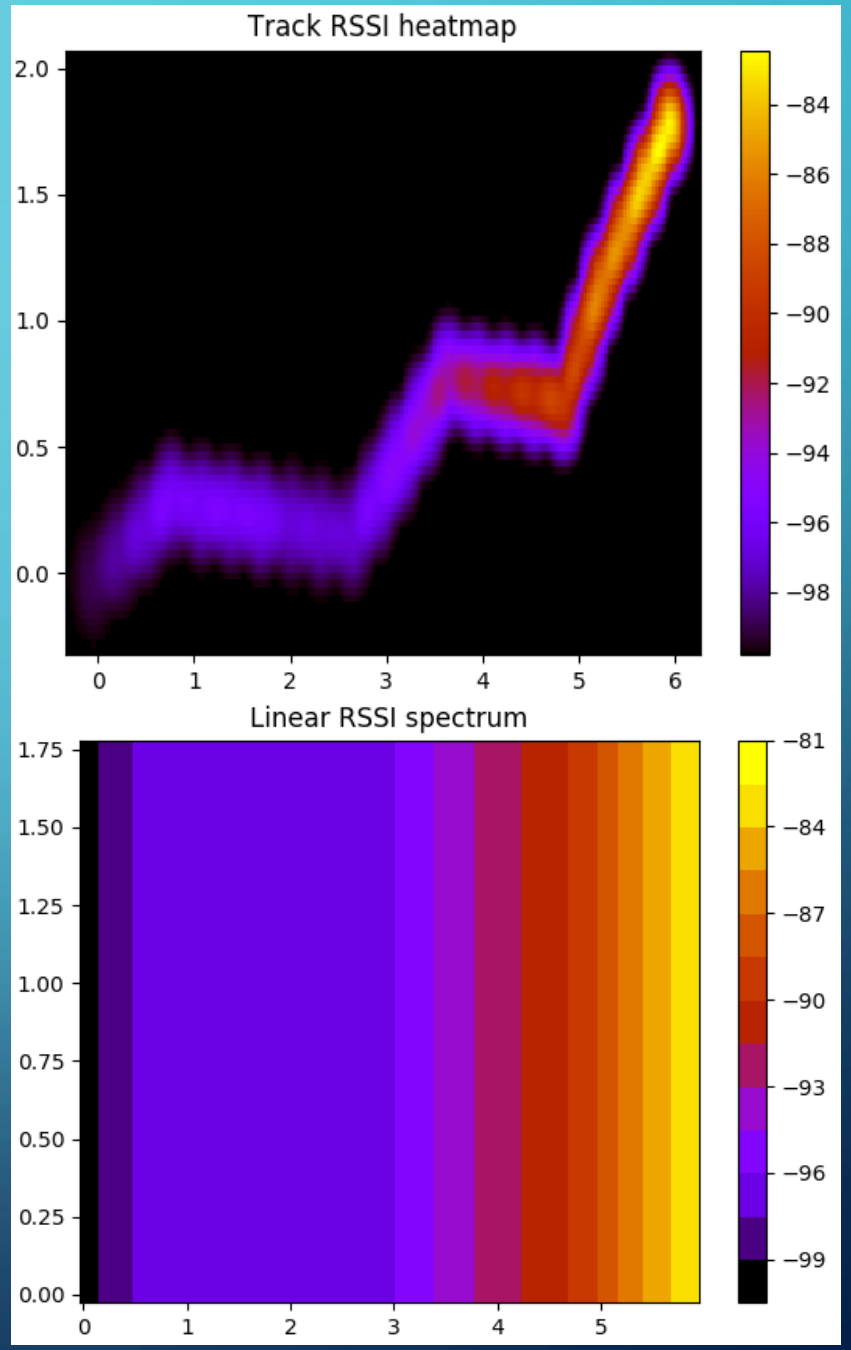
IMPLEMENTATION

- TX-RX properties
  - Transmitting IQ with TX buffer
  - No self-reception
- Stabilizing Measurements
  - Clearing bias
- Directional Antenna
- Robot Algorithm walkthrough
- Custom recovery



IMPLEMENTATION

- Dataset
  - "Virtual" scatter data points
  - Fill in the gaps
- Vehicle Route Heatmap
  - Kernel Density Estimation
- Linear Spectrum



THANK YOU FOR YOUR TIME