

INDI-ROMI JONES

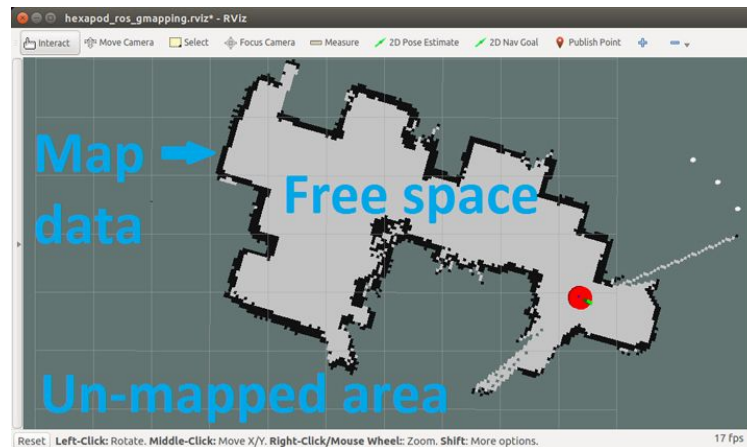
Collaborative Robot Exploration and Path Planning Using
LiDAR, SLAM, A*, FSM's, and BLE

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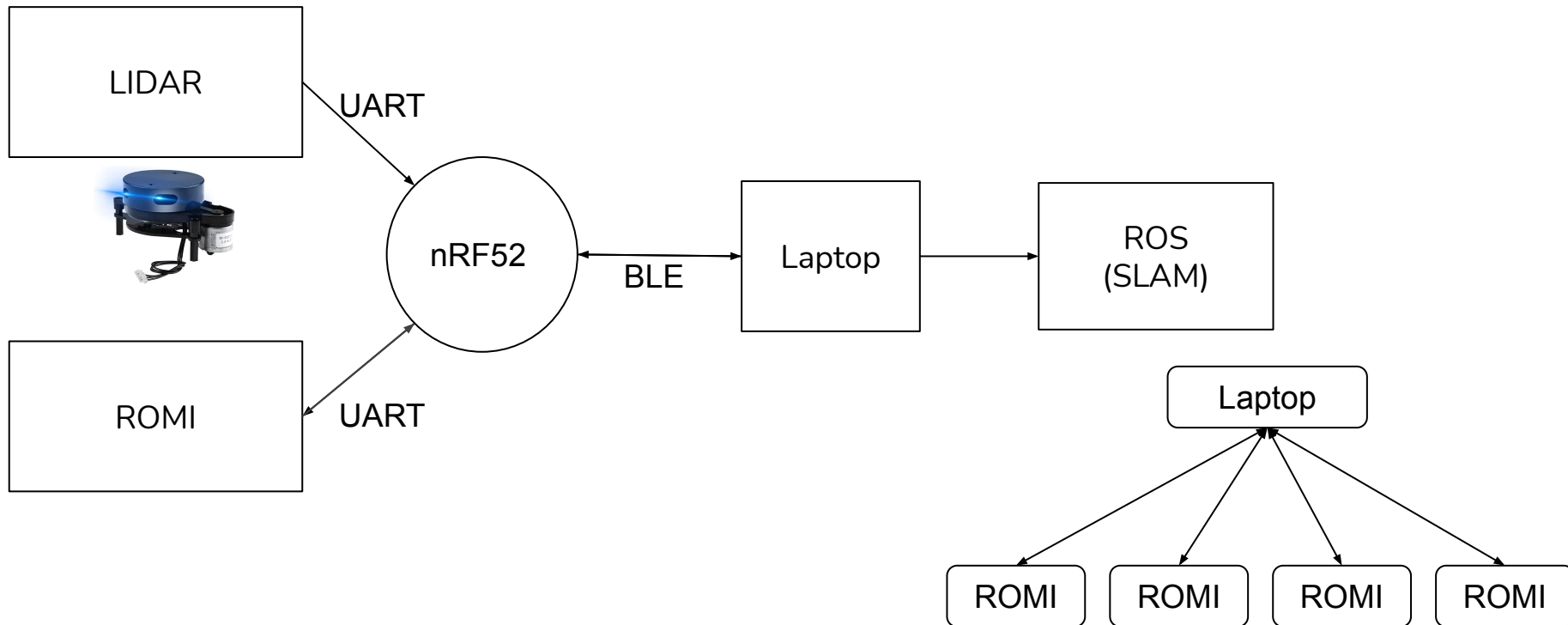
Project Overview and Goals

Multiple Romi robots collaboratively explore and map a physical maze by using lidar sensors, wheel encoders, and gyroscopes to generate a map of their surroundings and localize themselves within the map.



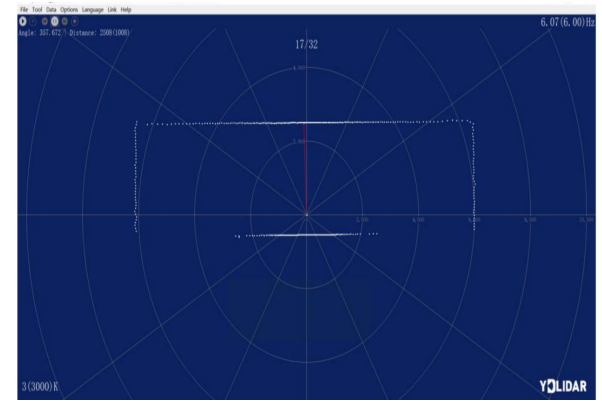


Architecture





Progress so far



- Tested the YDLiDAR X2 Point Cloud Viewer, a point cloud data visualization software LidarViewer for X2 real-time scanning.
- Built a modified version of the romi's used in lab by mounting the Buckler under the provided platform to mount the lidar on top of the romi.
- Successfully communicated with nRF52 using BLE



Resources needed and risks

Collaborative SLAM Library

The lidar cannot detect objects that are closer than 3cm from the wheels. Also it's possible that the LiDAR sensors we ordered break.

May need to do signal processing on LiDAR sensors.

We can't communicate simultaneously with multiple peripherals using UART. This means we might not be able to move the robot and collect and send scan data simultaneously.



Schedule of remaining time

November 16: Get a single robot to read data from LiDAR sensor

November 19: Get sending LiDAR data over BLE working
between a Romi and a laptop

November 19: Complete Maze Wall Build

November 24: Get a single robot to map a simple space

November 26: Get a single robot to path plan and execute plan
using a map to move to objective coordinates

November 30: Milestone 2

December 5: Get 2 robots to update the same map

December 15: Final Presentation and Demo

December 17: Project Report Due