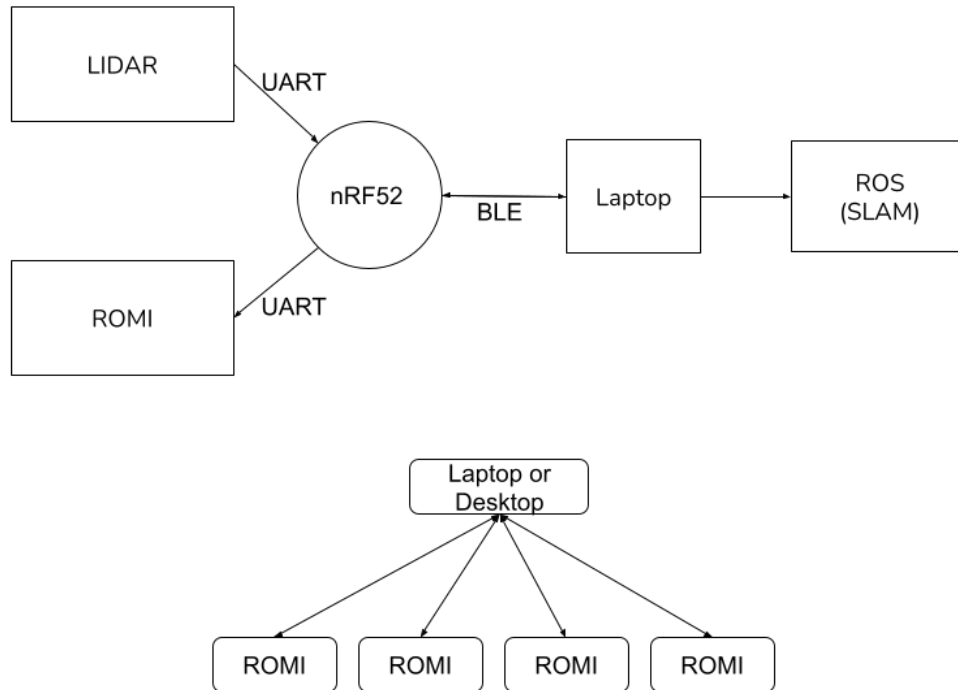


Project Title: **Indi-Romi Jones: Collaborative Maze Exploration**

Team: *Bassem Halim, William Catzin, Mark Lindblad*

EECS 149/249A Milestone 1 Report, Fall, 2021

Architecture



Progress So Far

- Tested the YDLiDAR X2 using a provided data visualization software
- Built a modified version of the romi's used in the lab by mounting the Buckler under the provided platform to mount the lidar on top of the romi.
- Successfully communicated with nRF52 using BLE

Project Repository: <https://github.com/MarkLindblad/indi-romi-jones>

Modification of Goals and Project Scope We have changed our project goal to be collaborative maze exploration to find an exit and then to path plan to that exit, rather than trying to retrieve objects from the maze. After discussing with GSI's, we realized that we underestimated the difficulty in creating a robotic system for moving objects. To do so, we would have to create a way to identify the presence of an object, identify its position relative to the robot, and then manipulate a claw to pick up the object.

List of needed resources (code, parts, expertise, etc.)

- At least two Romi robots and lidar sensors.
- Some material to build the maze (cardboard, poster board, etc.)
- ROS workspace with dependencies and packages to use SLAM library (gmapping)
- YDLIDAR X2 ROS SDK

- nrf Serial library

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

Member Task Assignments

	Bassem	William	Mark
Setup Robot Hardware	Owner	Member	Member
Bluetooth	Member	Member	Owner
Build Maze	Owner	Member	Member
ROS	Member	Owner	Member
SLAM	Member	Owner	Member
Exit Detection	Member	Member	Owner
Path Planning	Member	Member	Owner
Exploration Planner (Determine Which Areas to Explore)	Member	Member	Owner
Integrate next direction determination	Owner	Member	Member

Identification of Major Risks

- We might not be able to move the robot and collect and send scan data simultaneously.
- Both the ROMI and the LIDAR use UART which can only communicate with a single peripheral at a time.
- The LIDAR cannot detect objects that are closer than 3cm from the wheels.