Project Pitch (Team 1)
SLAM

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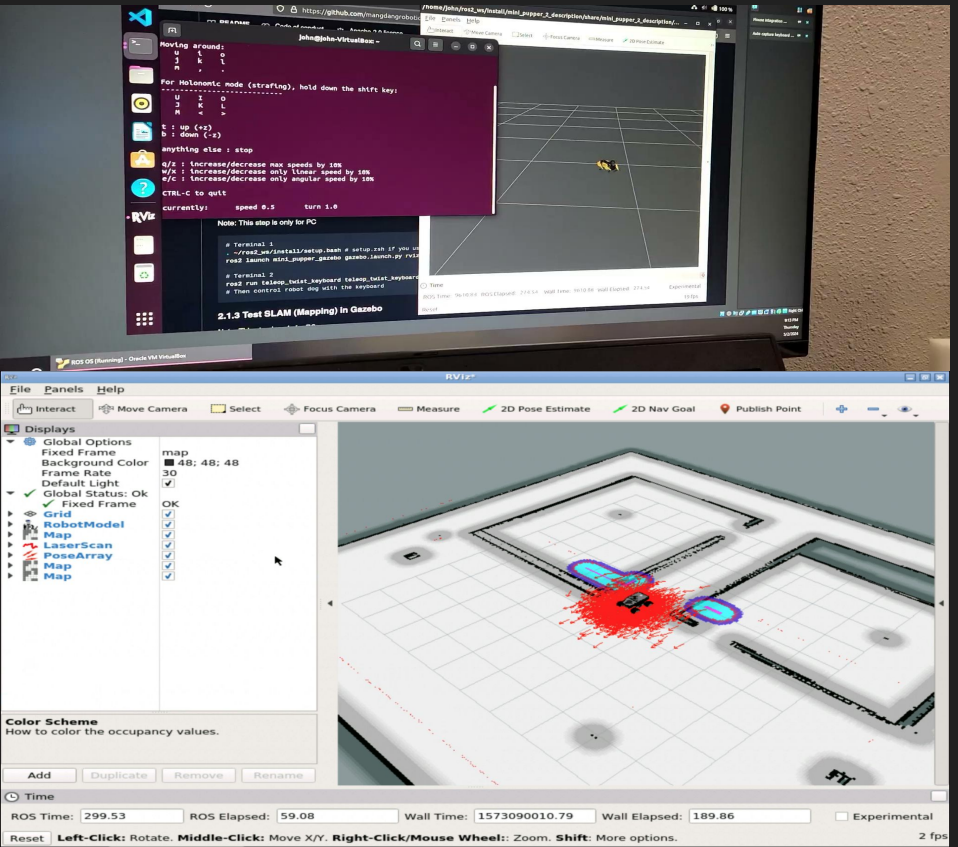
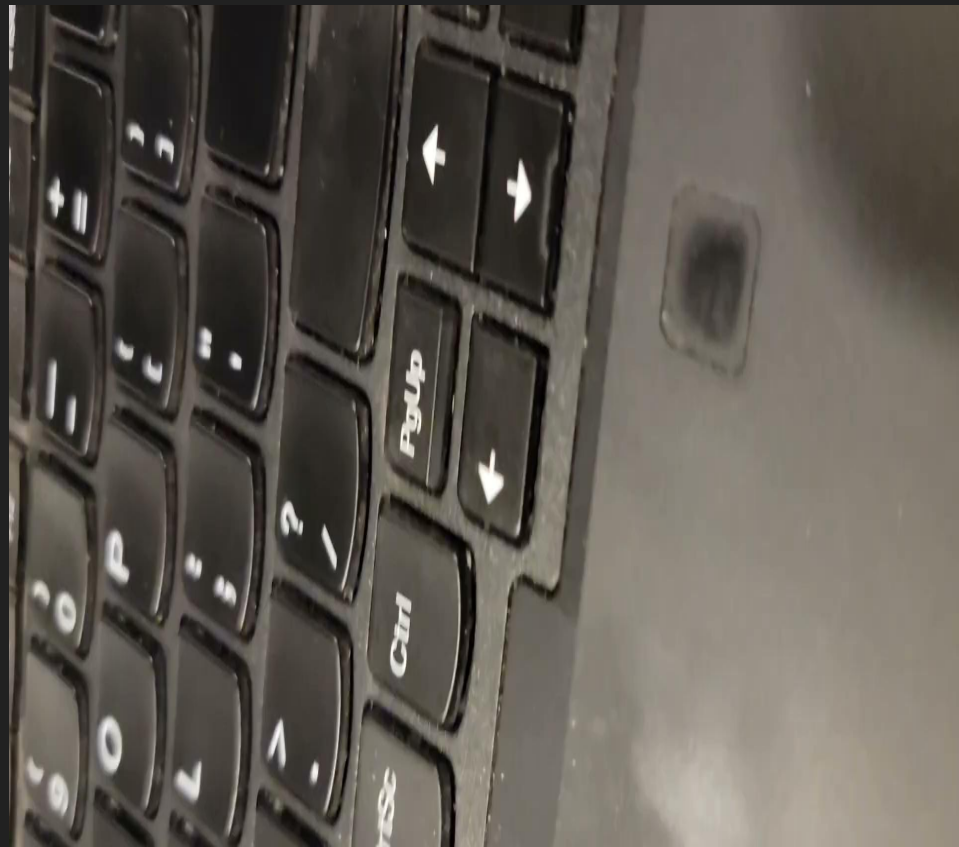
Central Goal

- Our central goal is to map a room by incorporating SLAM.
- The reason we want to do this is because mapping and localization is an extremely important aspect of larger goals in robotics. Orienting the robot to obstacles in the room would allow it to better navigate and achieve other goals.

Central Goal - SLAM Mapping





Robot for Task - MINI Pupper

- Misty Robot had inconsistencies with usage
- Additional setup is required
- Theoretically higher degree of control on the Pupper

Approach - Robotics Concepts

- Practical Interaction with ROS
- Closed Loop Control (Can check Input and Output)
- SLAM (Superior Pathfinding)

Approach - Hardware Interaction

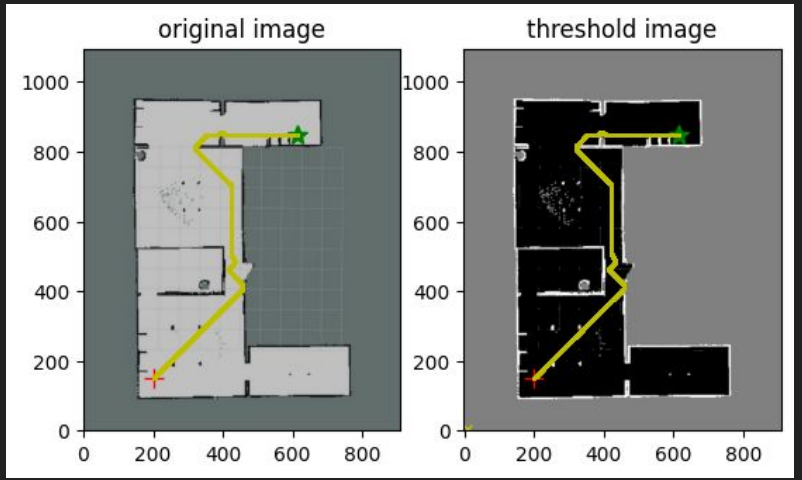
- LiDAR sensor
- Servos (~Kinematics, Movement, Collision, Stability)
- LCD

Approach - Software Interaction

- ROS Visualize Bot View using RViz
- Superior movement with twist and subscriber/publisher for closed loop commands
- ROS Functions - OccupancyGrid, MapMetaData, LaserScan, Odometry

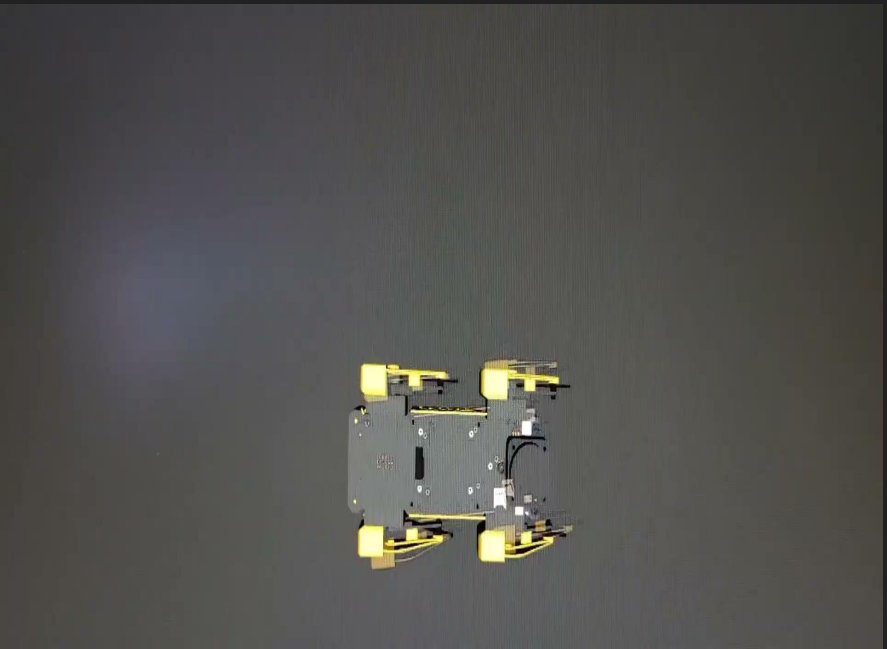
Approach - System Evaluability

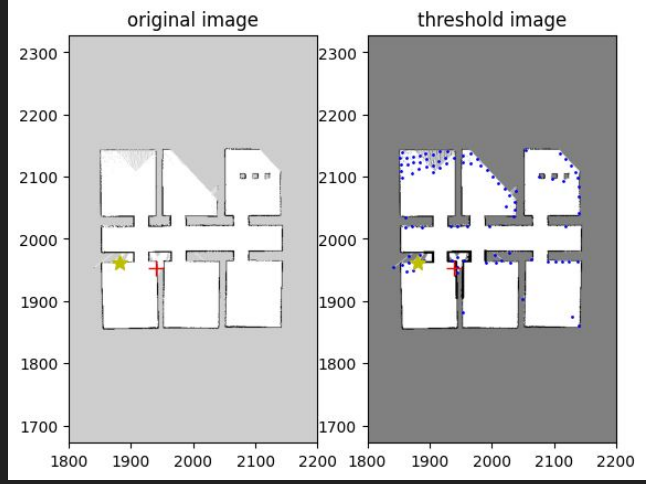
- Pathfinding without ROS
- ROS Simulation Explores
- RViz Map Reflects Real Life
- Reasonable Bot Movement

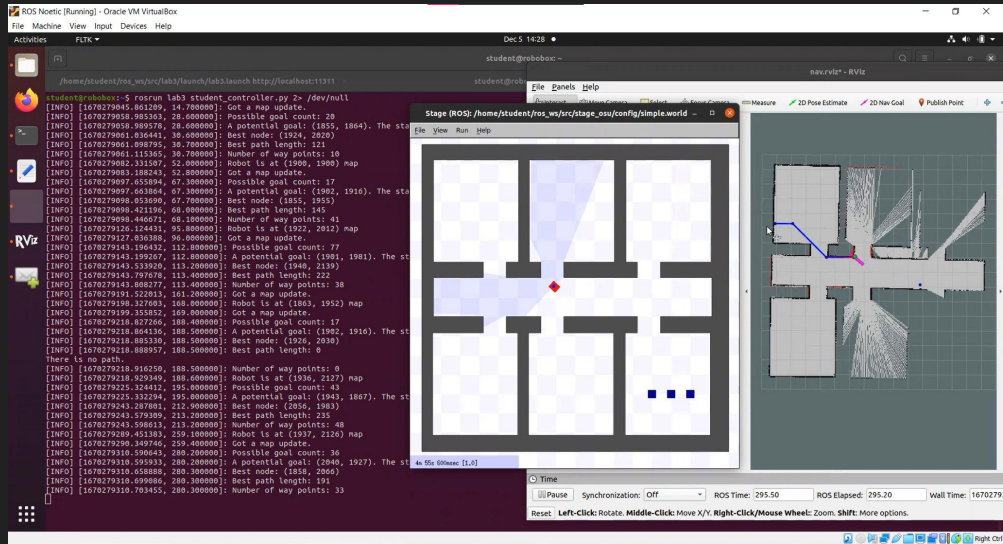


Relevant Insights

- Mangdang has a [github setup process] for ROS2.
- ROB 456 Simulated SLAM Project for Reference.







Mid Project Success Criteria

- Simulation Working
- Lidar Integrated
- RViz Actual Room SLAM images produced

End Project Success Criteria

- Actively Explored a Real Room
- Produced Reasonably Full and Accurate Map