

Robot Waiter at Red Dot Bar

The Team



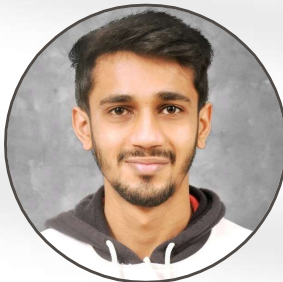
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Telecommunication



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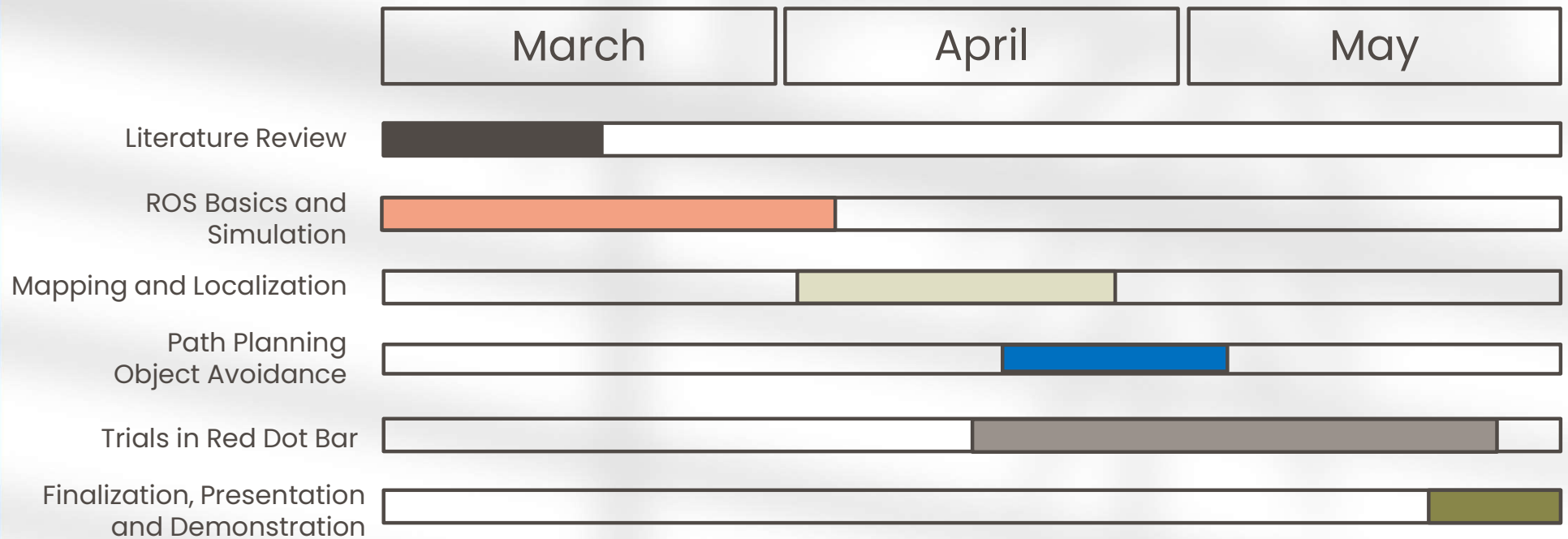


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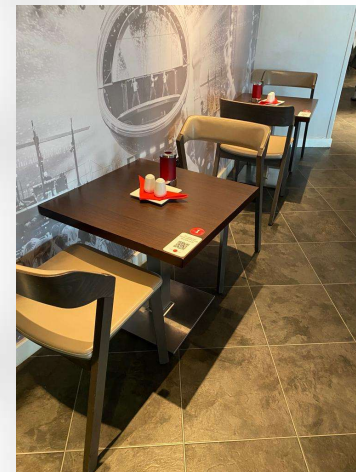
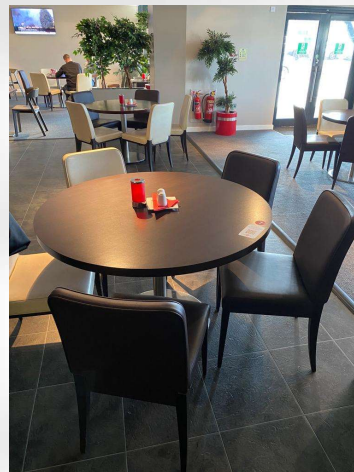
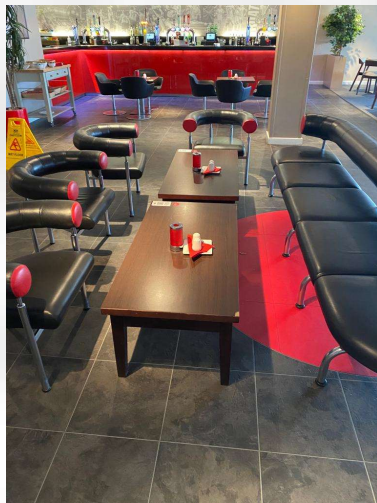
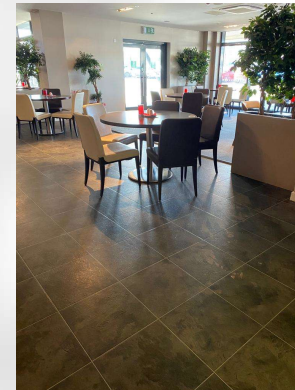
Project overview

- This Project discusses the use of a Robot in a restaurant environment
- The robot will be used as a waiter to deliver food and drinks to customers in the Red Dot Bar
- The robot will be able to navigate across the restaurant floor autonomously to deliver orders to the right customers while avoiding any obstacles in the path

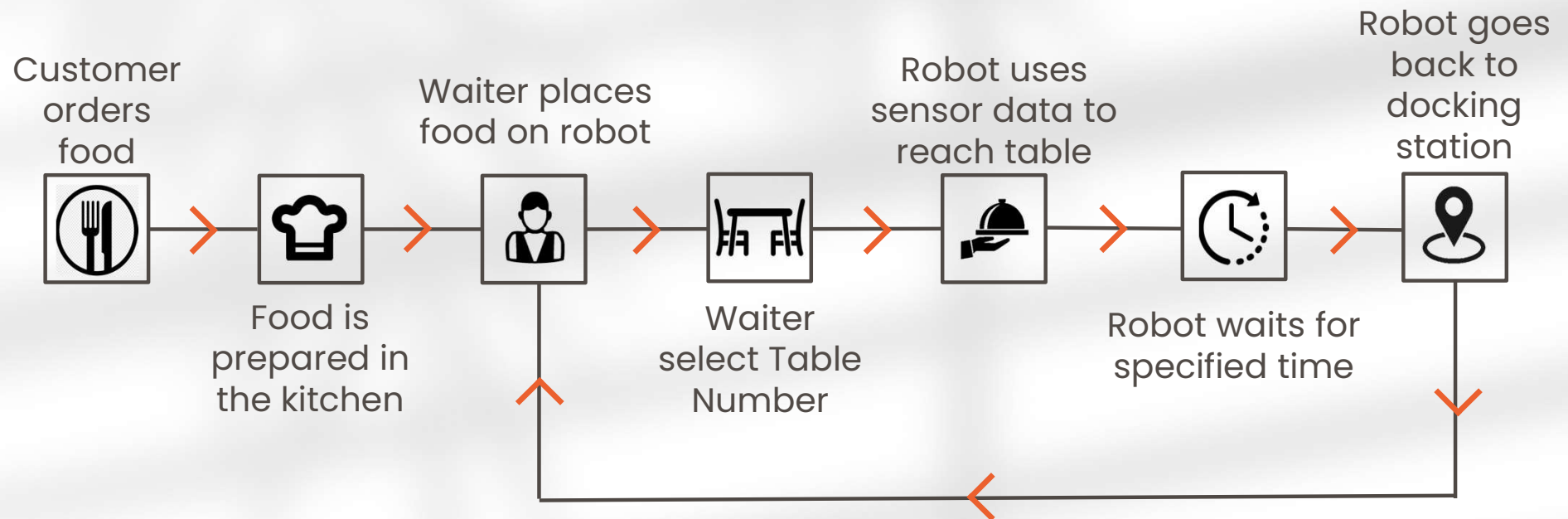
Project schedule



Environment

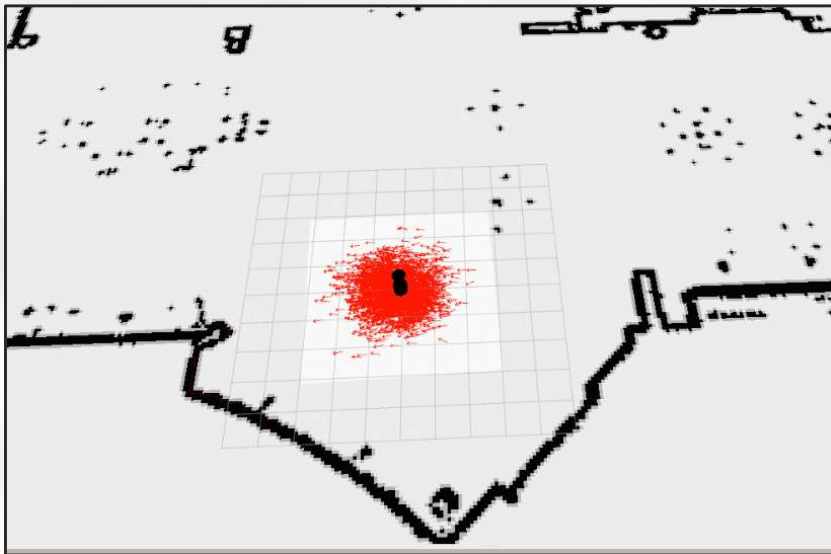


System Architecture



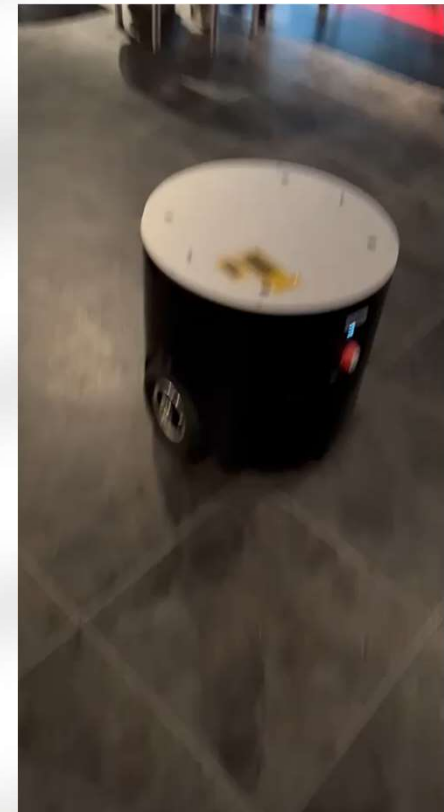
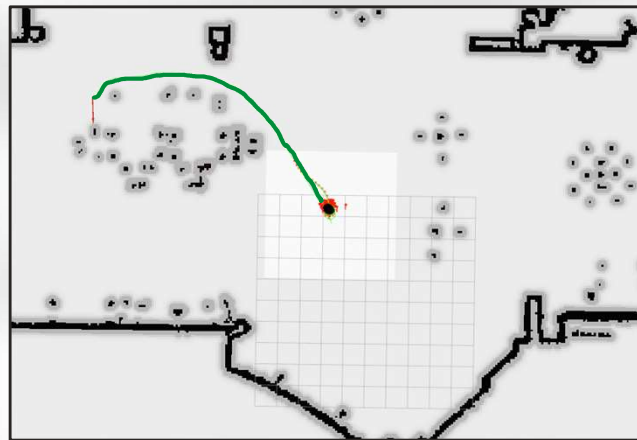
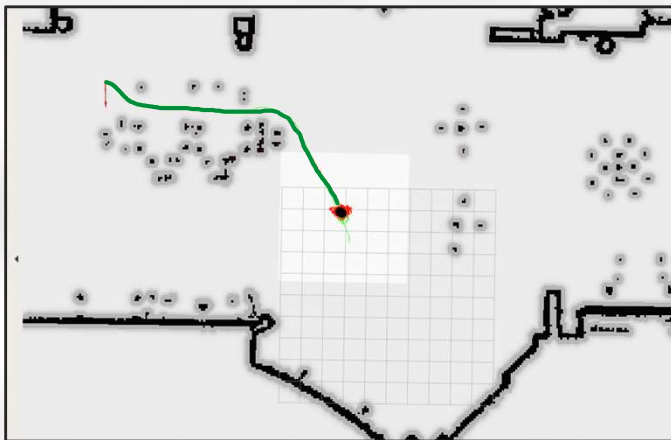
Localization

- Ability of the robot to detect where it is in a given environment
- Failure in localization may result in poor path planning



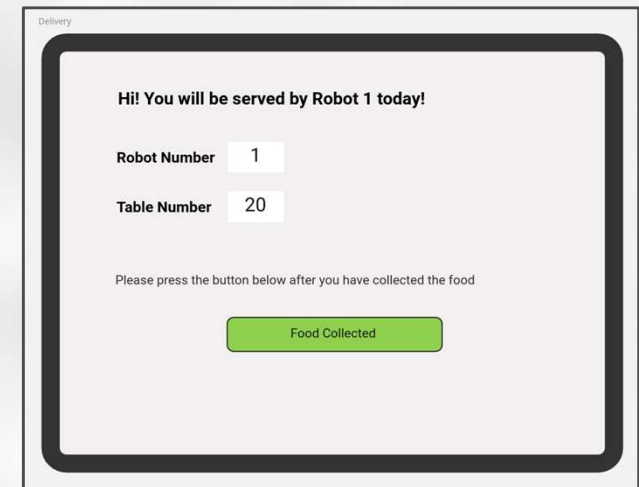
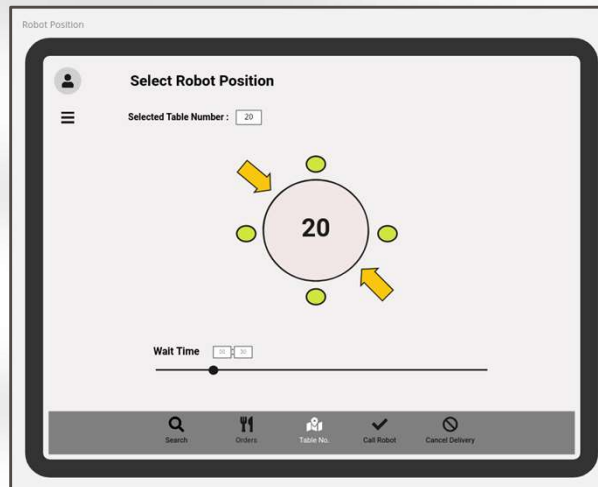
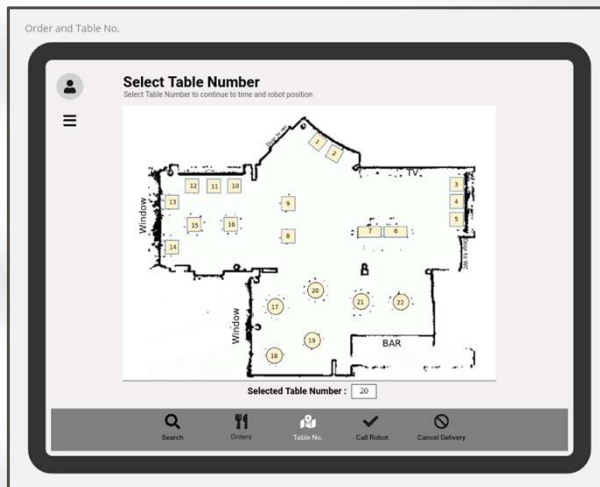
Path Planning & Object Avoidance

- Going from current position to selected destination
- Ability of the robot to avoid any obstacles in the path to the destination



Human-Robot Interaction

- ✓ Easy communication with the robot
- ✓ Easy to Use for waiters as well as customers
- ✓ Reduces human interference



Challenges

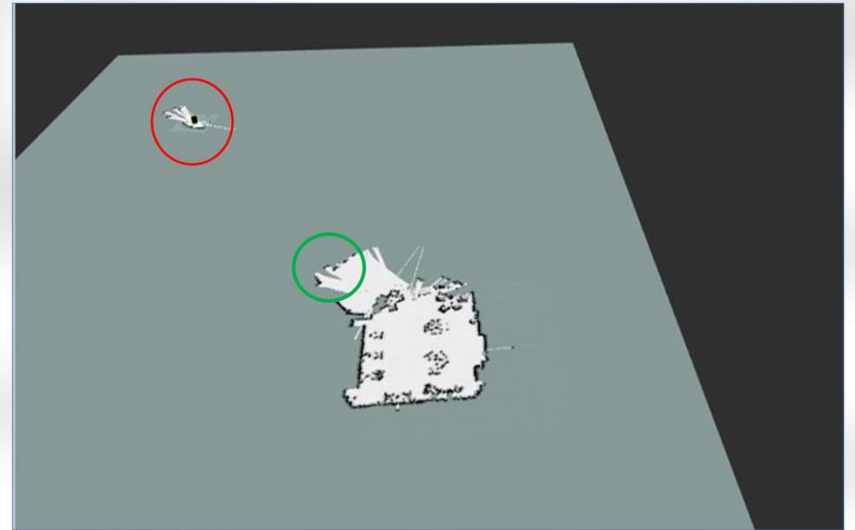
- Uneven Terrain



- Lower plane of LIDAR Scan



- Wheel Odometry Sensor Drifting



Solutions

- ✓ **Uneven Terrain:** Adding a bigger Castor wheel to accommodate for uneven terrains (Future)
- ✓ **Object Avoidance:** Combining depth camera and LIDAR data for better understanding of the environment and to avoid obstacles of varying heights
- ✓ **Localization:** Combining multiple sensor data and tuning of parameters to achieve a better localization (stop the robot from getting lost)

Achievements

- ✓ Successful localization in the red dot bar environment
- ✓ Robot goes from the docking station to specified table
- ✓ Robot can calculate the shortest path required
- ✓ Robot can avoid people or objects in its path and re-calculate the path to its goal
- ✓ Easy to give instructions to the robot



Thank
You!