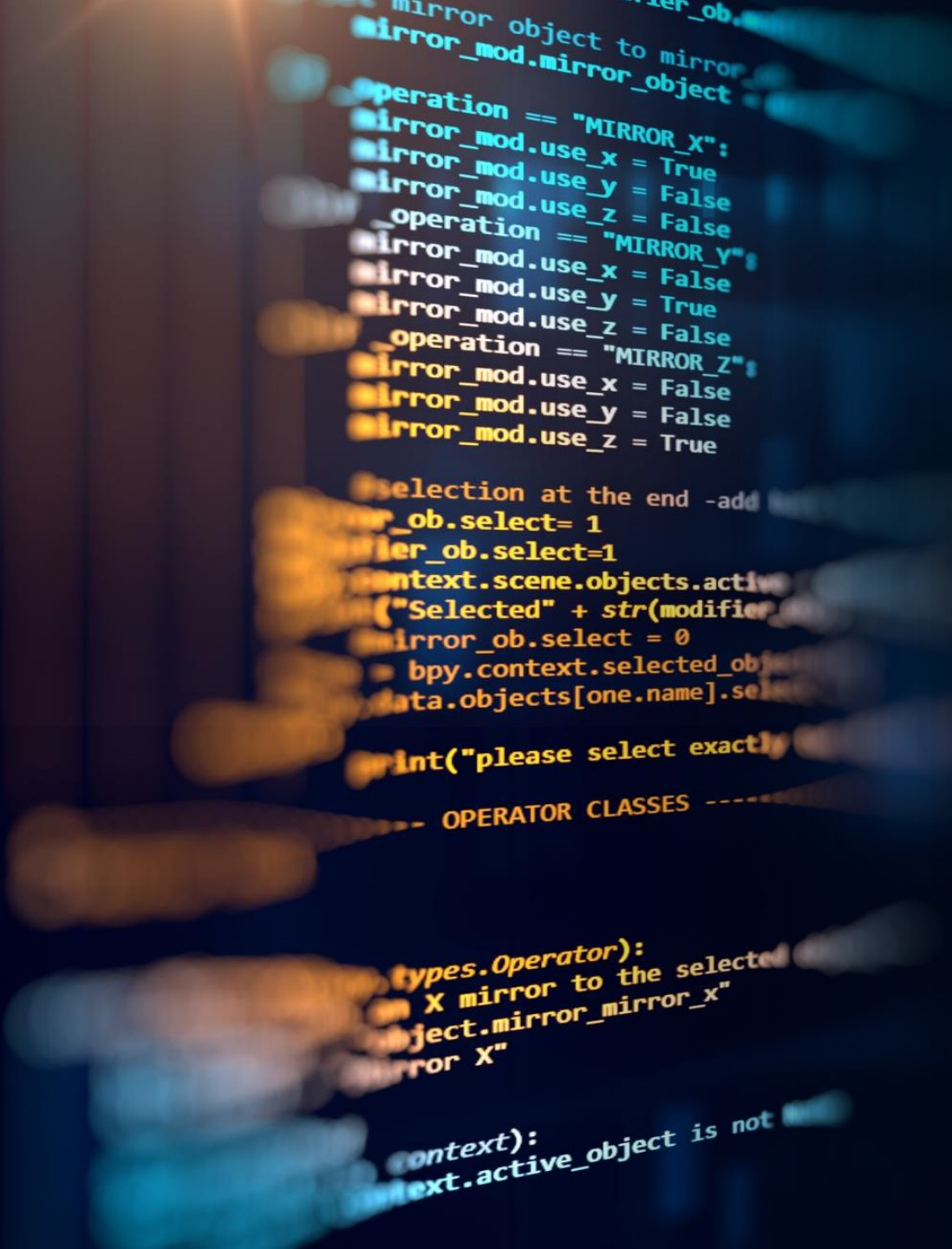
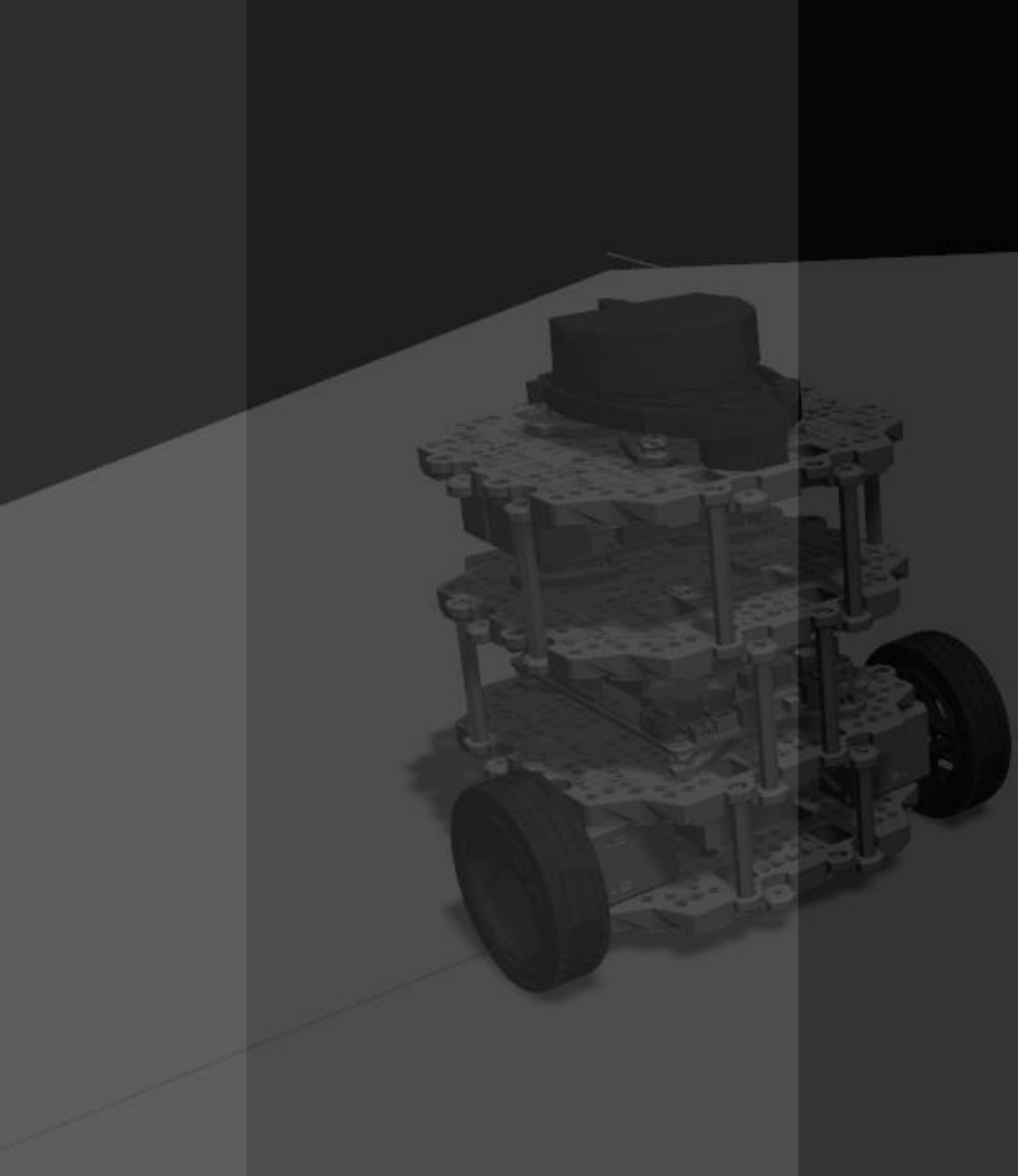


Advanced Software Development for Autonomous Mobile Robots

Final Project - Presentation



Team Introduction

Team Name

Potterheads

Members

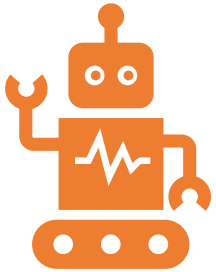
Adithya Sabarish Saravanan (32979)

Arulious Jora Antony Raj Sathish (33048)

Turtlebot

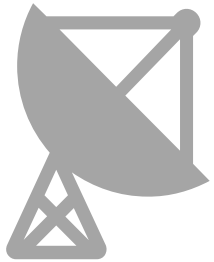
Harry_potter

Introduction



Problem Statement

To navigate Harry_potter to a given goal point in a predefined environment collecting the rewards while avoiding obstacles at the same time.



Resources

Move base navigation stack as the server.

Goal publisher.

Obstacle avoidance.

A Navigation client to control Harry_potter.

Algorithm – Client node

Receive

- Receive the goal from goal publisher; Sort goals based on rewards; Choose the first goal.

Send

- Send the goal to the move base server; Monitor the state of that goal.

Repeat

- If the goal is reached, repeat step1; Continue until all goals are reached.

Special cases – Case 1:

After 15 seconds, if Harry_potter stops or if move base responds that it cannot reach the goal

Cancel the goal for move base.

1

Navigate Harry to the 10th way point (0.25m) on the path planned by move base

- The planned path is obtained from move base as waypoints using the ROS service Getplan().

2

Resend the goal to move base.

Special cases- Case 2:

For goals with very high rewards I.e., if the path to reach the goal is very narrow

Cancel the goal for move base.

1

Get the plan from move base

2

Using the plan and obstacle avoidance algorithm, make Harry_potter follow the waypoints to reach the goal.

Special cases - Case 3:

If there is a timeout of 120s

Abort the goal; Move Harry_potter **to** the **origin using move base.**

1

The **next goal** is updated to **move base.**

2

The aborted goals are stored and re-attempted at the end.

Obstacle avoidance

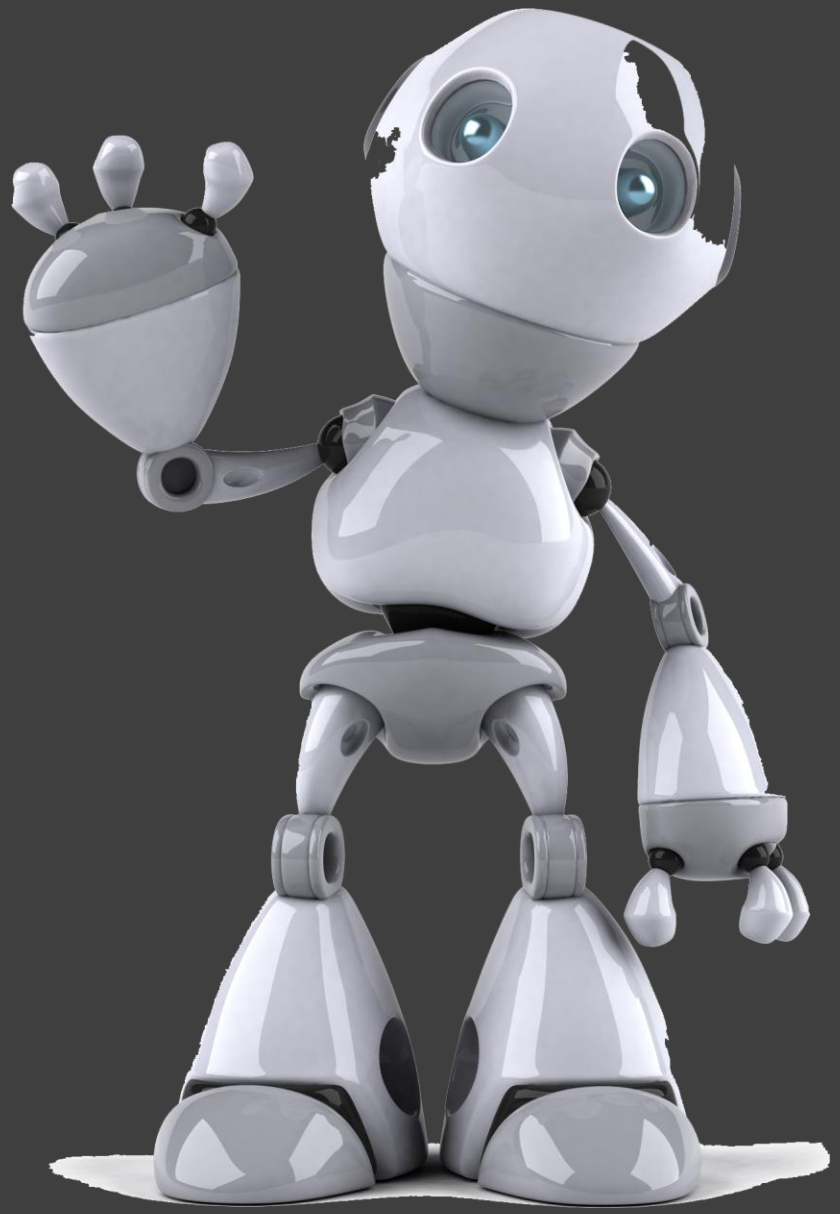
Turn

- If an obstacle is observed in the front 36 degree region
  - turn Harry_potter by 36 degrees to the left or to the right; whichever side has no obstacle in the 36 degree span.
  - Rotate Harry_potter until there is no obstacle in the front

1

Move

- Move one meter in the same direction as long as there are no obstacles in its path.
- No obstacle => Free space > 0.2 m



Thank You