

Lab05 Report

1) What are the names of everyone in your lab group?

Lara Vochteloo
Blake Peery
Drake Morley

2) Why is sensor noise problematic when mapping?

Sensor noise may give robot the impression the obstacles are somewhere when they are not. This leads to the robot creating an inaccurate map and thus not finding the shortest/ any path

3) How did you choose the value with which you increment the map entry? What happens if the value is too small, what happens if it is too large?

We chose the value provided in the specs, 0.005 (NOTE IF WE TUNE). If the value is too small, the threshold may not be overcome meaning an obstacle could truly be there but be undetected. Vice versa for too big an increment, some sensor noise could end up being included as obstacles. It is important to find the correct threshold.

4) How did you choose the value to threshold your map? What happens if the value is too small, what happens if it is too large?

The threshold value was chosen as 0.5 (NOTE IF WE TUNE). Too big and too small threshold is the same as increment but opposite effects. The threshold and increment need to be tuned together and consistent.

5) As Tiago is traveling along the path that the planner provided, suppose it detects an object in its way. How could you modify your solution to plan around/gracefully handle this unforeseen object in the robot's path?

When an unknown object is detected the robot could have a function that stops the robot, takes its current location, adds the new sensor information for the object detected to the current map and then re-enters the path planning function using the current location as start and the same final location.

6) Could we use an algorithm like RRT to generate a viable path instead of Dijkstra's algorithm/A*? If yes, how would the path look different? If no, why not?

RRT may find a feasible path more quickly than A* but the path found will not necessarily be the shortest/ optimal path.

7) Roughly how much time did you spend programming this lab?

Approximately 6 hours