**LAB CHALLENGE 3 REFLECTION**

**Acksaren Ravinjan**

**SDR520**

1. **What is autonomous navigation in mobile robotics?**

Autonomous navigation in mobile robotics is essentially where an autonomous vehicle can figure out its precise location and follow a path of its own and without the help of human interaction or interference.

1. **What parameters does the robot navigation algorithm consider when planning a path?**

When planning a path, the robot will need to know or have a sense of it own of the environment it is placed in. By analyzing the arena and gathering data from within a certain arena is very important and the data within that arena is crucial. Tracking objects and knowing the state and localization are all very important parameters. All this allows the robot to navigate and help its way around choosing its path.

1. **What is a cost map (in the context of autonomous navigation)?**

A cost map is a grid that has specific data and cost for that specific area, for instance if a robot is close to an obstacle that square will be considered of higher cost. Cost maps are allowed robots to find a path that is the most efficient and at the same time avoiding any obstacles that it needs too.

1. **What is inflation radius (in the context of autonomous navigation)?**

Inflation radius helps with navigation in autonomous robots by helping the robot detect so called buffer zones when an object is going to come into contact of the robot. This overall would help a robot avoid obstacles through the inflated radius and avoiding the collision of hitting obstacles and finding the shortest path possible.

1. **Which navigation parameters did you tune using the document in the link below?**

http://emanual.robotis.com/docs/en/platform/turtlebot3/navigation/#tuning-guide And briefly explain them.

Overall, I reduced the inflation radius and figured out that the buffer zone was also reduced. I determined this was allowing the robot to go closer to the obstacles but thought it was not a good idea. What I did later was that keep an inflation radius around the perimeter of the robot’s radius. Also, by increasing the cost scale factor I figured out that it reduced the cost value. By reducing the inflation radius and increasing the cost factor it allows the robot to go closer to the obstacles.