Home Service Robot

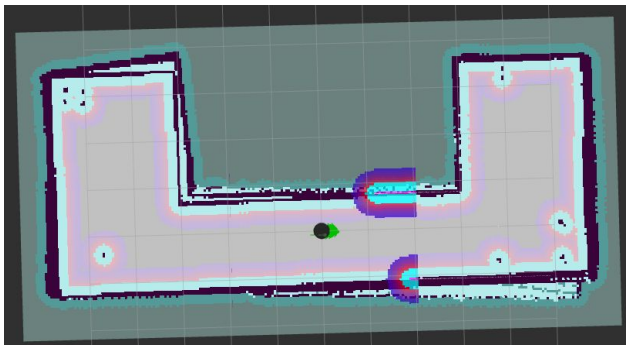
This includes a brief write-up explaining the packages used for this project, covering localization, mapping and navigation.

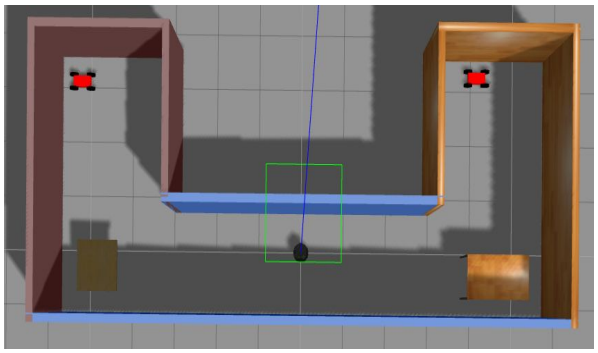
Mapping

gmapping Package provides SLAM based on laser sensory data and odometry values. By using this package, we can create a 2D occupancy grid map that can be used for navigating the robot.
The map will be updated as the robot moves and collects sensory information using its laser range finder sensor.

Localization

Adaptive Monte Carlo Localization (**AMCL**) Package is a probabilistic localization system for a robot moving in 2D. It implements the adaptive Monte Carlo localization approach, which uses a particle filter to track the pose of a robot against a known map. It adjusts the number of particles among time dynamically, as the robot navigates in a known map.





Navigation

By using the ROS Navigation Stack package, a path for the robot can be created avoiding obstacles. The algorithm used in the package is **Dijkstra's algorithm**, which is Uniform Cost Search.