

# Assignment 5

The objective of this assignment is for you to expand your familiarity with Turtlebot 2 robot, develop the navigational capabilities and observe the robot moving in the real world. This assignment is also a team assignment.

## **1. Following a wall at a fixed distance (team) [50%].**

Implement a new node that will control the Turtlebot 2 and guide it next to a wall detected by the kinect sensor at a fixed distance. Ensure that the robot can start from different locations and navigate to the correct distance. Save your runs using a bag file.

## **2. Particle filter propagation (Individual) 50%**

Using the odometry study from assignment 4, and the motion commands of question 1 (bag file) implement a particle filter propagation model and plot the particle cloud as the robot moves.

## **3. Bonus question 20%**

Augment question 1 to have the robot rotate by 360 degrees at regular intervals use the grid\_mapper node from Assignment 4 to map part of the Swearingen building.

## **Evaluation:**

I will arrange with every team to see a demo of the navigation and mapping behaviours. In addition write a report discussing your findings, problems encountered, and the distribution of work among the team members.