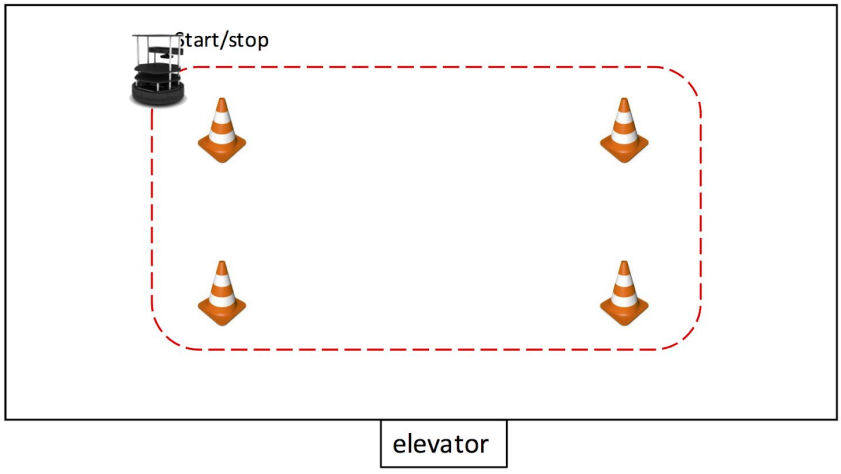
CMPUT 412: Experimental Mobile Robotics
Winter 2018
Competition #3
Date: March 15, 2018
Race with GMapping and AMCL

Objectives: Study the use of robot mapping and localization algorithms in the application of road following

Procedure

In this competition, your robot will use GMapping in ROS to build the map of an environment and race along a loop within the environment by using AMCL to localize the robot. Moving along the loop can be done with either ROS packages or your own motion control algorithm. The location of the race will be in the open area on the north end of the second floor of CSC building (illustrated in the figure below). Four pylons will be placed at fixed locations to mark the four corners of the loop. The only constraint is that when turning the corners, the robot must be on outside the pylons as indicated by the dashed line. The robot will start from a fixed location and each race will require the robot to complete the loop two times. At the end of the race, the robot should come to a full stop.



You should build the map with GMapping prior to the competition as accurately as possible, and load and use the map during the competition. Your robot will have three chances to run the race, and the best time of the three runs will be used in ranking among the teams.

Marking Scheme

For teams that are able to complete the race (two laps at least once), the team with the best time will receive 100% of the marks, and that with the 2nd best time 95%, etc. For teams that are not able to complete the race, you will receive reduced marks proportional to the amount of race that your robot is able to complete (e.g., 1/4 x 100 x 90% marks for a third place finisher able to run half a loop).