VG 100 Introduction to Engineering (Summer 2017)

Project 1: Maze Robot

Project description

The goal of this project is to help students get familiar with necessary components for building a robot, including microcontrollers, motors, and sensors. Students are required to build a wheeled mobile robot equipped with a range sensor and a camera. The robot should possess the following functions:

1. Move forward and backward
2. Turn left and right
3. Adjust motion speed
4. Detect and avoid walls or other obstacles in the environment
5. Recognize signs (arrows) on the wall
6. Move through a maze by following arrows on the wall

Schedule and Location

This project will take 4 weeks and the final competition will be held in Week 5.

Session 1: Wednesday, 16:00-17:40

Session 2: Tuesday, 12:10-13:50

Lab: JI General Engr. Lab 1 (4F)

Final Test: June 13, Tuesday, all teams

Game Day: June 14, Wednesday, all teams

Competition Rules

- Before the competition, each team should assemble, program and finish the test of its robot.
- Prior to the competition, each team should place its robot at a designated location and get it ready for the competition. No team is allowed to retrieve its robot for adjustment until the competition ends.
- Each team has totally 3 trials to let the robot go through the maze and each robot will be given 5 minutes to clear the maze in every trial.
- Between trials, each team gets 5 minutes to adjust its robot if the previous trial fails. Exceeding the 5-minute time limit will cause the loss of one trial, which however will buy the team another 5 minutes for adjustment.

- Due to any reason, if the robot fails to go through the maze, its travel distance within the maze will be noted as the basis for grading.
- During the competition, only one designated team is allowed to try its robot on the maze. Any team violating this rule will get a deduction of 20 points in its grade.
- During the running of the robot, touching or helping it in any way is not allowed and will result in the immediate failure of that trial.

Grading Policies

- This project counts 20% towards the final grade of this course.
- This project will be graded on the scale of 0-100 points with 50 points for basic functions (1)-(5) of the robot and the other 50 points for going through the maze.
- In case that the robot fails to go through the maze for any reason, the grade will be based on its travel distance in the maze.
- The time that each robot takes to go through the maze will be recorded. It will be used only to rank every team.