

CS 491/691X – Topics: Introduction to Robotics

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Lab 7 – Handout

During the first 15-20 minutes of the lab you will have time to test and refine your “line following” programs. After that time we start the contest. Make sure that you have the robots ready to run, as we have only 5-6 minutes during which each team could compete with their robot.

After the contest, you will also start to prepare for the next lab, the Harvesting Contest (handout for lab 8 will be provided).

Line following

For the contest in this lab you will use the optosensors provided with your kit and your line following programs to follow a black line on the floor. You will use the pad in your Lego Kit, which has a black line contour on a white background.

Contest rules

- a) Your robot will start away from the line to be followed, facing it at a random angle. The robot should detect when it reaches the line, then it should start following it, continuing for at least one full turn. There is no need to detect when one full turn has been completed. We will stop the robot once it achieves the task.
- b) Each time your robot goes completely off the line, you will get one negative point.
- c) If you get 3 negative points during the contest, you will have to do it again until you finish the contest with less than 3 negative points.
- d) The winner is the one who finishes the contest faster and with less negative points. The time has 50% of your total score (i.e. if you finish the contest the fastest, you will get 50% of the total score). The slowest robot will receive 20% of the points, and everything in between will be scaled in this interval. The other half of the score is determined according to your negative points (i.e. you will lose 15% with each negative point). For example if you finish the fastest with 1 negative point, your total score will be $50 + (50 - 15) = 85$.
- e) The gear reduction of your robot has to be no more than 1-1. You are not allowed to use another gear train on your robot. You can only improve your speed by your program (software not hardware). For example the way you manage to follow the line affects your speed.