CS 5000: Theory of Computation

Assignment 3: Designing & Programming a Finite Automaton for the Junun Robot to Following Lines and Running Away from Obstacles

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Learning Objectives

1. FA in Robotics
2. Line Following Automaton

Problem 1 (5 points)

This assignment has only one problem. It will give you some experience with using JAL to program FA-like controls for Junun robot. Design and implement a finite automaton (as a JAL if-then-else-if procedure) for the Junun robot to engage in the following behavior. The robot starts with its middle floor IR sensor on a black line. The robot starts following the line. If the robot senses an obstacle in front with its two front IR sensors, the robot turns around, and starts following the line in the opposite direction. You may assume that an obstacle will be a solid object (e.g., a small carboard box) that will cover the line completely and will be tall enough to be sensed by the front IR sensors.

Take a look at the article saved in Paper_FECS_2015.pdf in your Box folder to get into the big picture. I will also upload JAL_README.pdf in your Box folder. This file will give you a startup on JAL. Another file is follow_line.jal. This is the JAL source code you can play with and modify in implementing your solution.

Sai Kiran Reka, a TA for this class, will be available in the lab (Old Main 405) Tue, Wed, and Thursday from 3:00 to 6:00pm to help you with questions. His email is saikiran.ky379@gmail.com.

Happy Hacking!