Vehicles Lab

Checkpoint: In lab the week of February 15, 1999
Due: In lab the week of February 22, 1999

For this assignment, you will implement two Braitenberg vehicles on your robot using Rex. These vehicles are

1. Love: vehicle 3a
2. Instincts: vehicle 4a

They are both described in Braitenberg, but to summarize, "love" should approach a lamp and stop a reasonable distance away from it and "instincts" should approach the lamp and orbit it at some reasonable distance.

This assignment is the first where the processor boards will be attached to the moving robot. Please take care of them and make sure that they are securely attached to the chassis, that don't rattle or fall off, and that they are protected from collisions with walls and chairs. You will also be using two light sensors for this assignment. It is up to you where you place them on the robot and how you use their outputs to generate the required behaviors. Bear in mind the following general points:

- The sensors are unlikely to have the same ranges of output values and response curves.
- The position and orientation of the sensors can change the behavior of the robot dramatically, even with no code changes.
- The sensors are somewhat flaky; readings are likely to fluctuate a little, even with the same light intensity.
- Before you start coding the behaviors, you should consider writing some code that simply reads and displays the sensor values. Then you can see what sort of range and response curve each of the sensors has. This knowledge is likely to save you a **lot** of time later on.

See the how-to handout for details on how to use Rex with a real robot and how to download your Rex-made machine onto your robot. The grading will be based on the overall performance of the robot and on the lab reports.

What to turn in

Your will have to demo your robot during your lab section. Bear in mind that you will have to show two programs, love and instincts. You should also turn in a single hard copy of the code that you wrote (commented appropriately) and a pointer to the electronic version.

Everyone should also write up a lab report (one per person), describing the expected and observed behavior of the robot, something about the design of the control code, and an analysis of the behavior. This analysis should include things like which conditions the robot will work under (and which will cause it to fail), rationale for choosing any thresholds you have set, and what effect changing these might have, how your implementation differs from Braitenberg's description, etc.

You have two weeks to finish this lab. However, at the end of the first week you are required to demonstrate your progress to your TA in your lab section. Although there's no official handin for this milestone, you should try to get at least the first behavior working by this time.