CMSC 143: Introduction to Object-Oriented Programming with Robots

Assignment 6: Robo-Cockroach
Due April 23, 2010

In this assignment, we will create an autonomous robot creature; we'll turn the scribbler into a robot cockroach. Your goal is to create a robot program that will run as long as possible without any intervention – to make the robot autonomous. You can add as many levels of behavior as you like, but at the very least your cockroach should:

1. Scurry about randomly looking for food.
2. Avoid running into things.
3. Run away from light.

You might add one or more of these behaviors:

1. Locate its nest (something bright green) and head home when it it gets tired (batteries run low).
2. Allow a user to drive the cockroach with the gamepad.
3. Interact with other cockroaches.

Learning Objectives

◦ Program Robot Behaviors ◦ Design Object-Oriented Programs

Deliverables

`cmsc143_cockroach_LASTNAME_FIRSTNAME.py` – Your cockroach program.

Your program should be designed and implemented in a modular object-oriented fashion. Each robot behavior should be implemented as a separate class. That way we should be able to add and remove each level of behavior easily (i.e. you should not create one loop with a bunch of if-statements). You should develop your program one behavior at a time. After each level is completed, you should write a paragraph (as a multi-line comment) describing how it works and how well it works. For example, the main part of your program might looks like:

```
behaviors = [AvoidObstacles(), AvoidLight(), Wander()]

while True:
  for b in behaviors:
     if b.active():
        move(b.t() , b.r())
        break
```