

Homework 6 - due 10/22/2003

15-491: CMRoboBits

October 20, 2003

1 Introduction

This lab will combine some of the skills that you have learned in previous labs to have the Aibo first locate the charging station and then to actually have it charge itself. This means that you will have to draw on your vision knowledge to create a new behavior, which can accomplish the task of locating the charging station from any starting orientation, approach the station, and finally rest on the charging station so that the contacts line up.

2 Procedure

We are providing a solution for the vision for the charging station tower and bullseye. To access the output of the vision in behaviors, subscribe to the FeatureSet. From the feature set access the field `vision_info->charging_tower` for access to information about the tower and `vision_info->charging_bullseye` for information about the bullseye. If you update the code, you will get these solutions. You will get conflicts for whichever one of these you implemented. Here are the possible ways to resolve the conflicts, in rough order of ease:

- Before you update, move Vision.cc to a file with a different name. This will avoid the conflicts
- After you update, move Vision.cc to a file with a different name and rerun update. This will result in the moved file having CVS conflict markers.
- After you update, resolve the conflicts in Vision.cc. The alternate version will be marked with:

```
<<<<<<<< Vision.cc
=====
>>>>>>>> 1.147
```

The lines between the Vision.cc part and the ===== part are your lines. The lines after the ===== before the line with the version number is the provided version. The simplest way to resolve this is just to delete your lines and the <<<<, =====, and >>>> lines

Create a new behavior called FindStation in dogs/agent/Behaviors. You can make use of any work you have done for previous homeworks. Specifically, if you chose the climb onto charging station task in homework 3, this could be very useful for this homework. In addition, the vision homework that you just completed might also come in handy. The new behavior that you create should act in the following way:

- Search out the location of the charging station

- Walk to the charging station
- Get up on the charging station

Important things to consider: We will be putting a two minute time limit on each test run, so make sure your program does not take too long from difficult configurations. If you decide to have a searching state and a walking state, be careful about the transitions between them.

3 Handin

What to handin:

- a memory stick image
 - mount /memstick
 - cp -r /memstick /afs/andrew/course/15/491/dropbox/groupXX/
 - umount /memstick
- a difference of your files from the repository
 - cd ~/dogs/agent
 - cvs diff -U 10 -N >hw6_diff.txt
 - cp hw6_diff.txt /afs/andrew/course/15/491/dropbox/groupXX/

4 Grading

We will evaluate your homework based on the successful completion of 5 runs of the robot from random starting configurations of our choosing. Grading will be based on the sum of the performances for all five runs. We will make sure to include at least one starting configuration where that charging station is not in view of the Aibo at all, so make sure to account for this case. The grading for each individual run is as follows:

Robot is seated on charging station so that contacts line up:	20 pts
Robot is over station, but not seated properly:	10 pts
Robot touches charging station:	5 pts

At the end of the time limit, we will stop the Aibo and grade you based on its current position. You may assume that there will be no other obstacles on the carpet. Only the robot and the charging station will be on the carpet. You may also assume that there is sufficient space for the robot to walk around the charging station. We will test with the charging station near the middle of the carpet.