

Assignment #3

Penalty Shooting

Due: Start of Lab, Week 13 (1pm, 26 October 2005)

This goal of this assignment is build upon previous assignments to make a robot achieve a more complex task. In particular, in this assignment you will write a behaviour for a single role in a RoboCup soccer team - the penalty shooter.

Students will perform this assignment in small groups of 2 or 3. You are requested to work closely together on the project, developing the code together (rather than using the “divide and conquer” technique of splitting the project into parts, developing the parts separately, and then recombining). Please work in different groups to the groups from Assignments 1 and 2. If you have a problem forming groups, please talk to the lecturer in charge as soon as possible.

0.1 Use of others’ software

You may use the same code as in the previous two assignments. You may also build on the solution to assignment 2 from any group.

You already have access to the source code of a complete soccer playing robot, including behaviours to complete most of this assignment. For this assignment you are free to use any base-station code, any C++ code on the robot (accessed through the VisionLink module) and the basic python behaviour files on the robot listed here:

```
PyLib/*
PyCode/Behaviour.py
PyCode/Constant.py
PyCode/Debug.py
PyCode/Global.py
PyCode/hMath.py
PyCode/Action.py
PyCode/Indicator.py
```

Note that parts of other files may be called by those files, and in particular `Global.frameReset()` calls `HelpTrack.determineBallSource()`. You should not add further references to other files, and you should look at the above code path to check that it does what you want if you use the global ball location variables.

You are *encouraged* to read the other python files, but please, no direct copying. You are also encouraged to build upon your code from assignments 1 and 2. You are encouraged to look at other RoboCup teams’ approaches (please acknowledge any borrowed ideas in your report), although again, no direct copying of code.

0.2 Deliverables

Part 1 of this assignment requires you to develop behaviours on the robot. These behaviours will be handed in as follows: Before the start of the lab when the assignment is due, each group should have checked into the Subversion repository (<https://roborouter.cse.unsw.edu.au/svn/comp3431/branches/>) a branch containing their code. This branch should use Subversion correctly so that the `svn diff` command returns a reasonably sized output. Each group should also have a checked out working copy of their code with no local modifications on one of the lab machines. The code in that working copy should be compiled and ready for installation on a memory stick. The compiled code should have been tested on the robot before the class starts.

During the lab we will make memory sticks from those working copies. The solutions will be compared and graded. Your behaviour should have its own python module usable by the `spip` script. The name of the python modules should be included in the report.

The report in part 2 should be an electronic file checked in to the same branch as your code. It should be in an easily readable format, *e.g.* plain text, html, PDF or postscript.

1 Penalty Shooter (7 marks - graded in lab)

In this part of the assignment your team will develop code to make a RoboCup legged league penalty shooter. It should follow the 2005 robocup rules available here: <http://www.tzi.de/4legged/pub/Website/Downloads/Rules2005.pdf>.

Rules summary: You will have a red robot shooting into the blue goal. The ball will be placed 1 metre from the centre line towards the blue goal. The robot will be placed 20cm behind the ball. There will be a goal keeper robot defending that goal.

Specific differences from robocup rules: The goalie robot will be standing still. If the ball goes out, it will be replaced near the initial position (as opposed to failing the penalty shot). If the attacking robot goes inside the goal box it will be placed back at the centre of the field (as opposed to failing the penalty shot). There will be a 2 minute time limit (as opposed to a 1 minute time limit).

Scoring a goal in one minute without ball or robot needing to be replaced will get full marks for this section. Scoring a goal in two minutes will get at least 5 marks.

2 Report (8 marks)

Describe the approach you used in the penalty shooter. Describe the strengths and weaknesses of that approach. Describe any testing or empirical comparison of different approaches you performed.