

Coursework 3: Games AI

Joanna J. Bryson

Swen Gaudl

March 14, 2013

1 Introduction

All of your courseworks are designed primarily to give you experience in developing intelligent control and/or cognitive systems. However, the course is also intended to give you experience and feedback in writing about research. To this end, you will be writing research reports of at least one full page of text but *not much more than two full pages of text* using exactly this format. Three is 50% more than two — too much. Submissions should be in the format specified for Coursework 1.

2 Approach

There are three different ways to do Coursework 3. There are two high-level options, then two assessment options for one of them.

2.1 Option 1

Do the other option on CW2 than you've already done.

2.2 Option 2

You will learn to build character Game AI using UT2004 and Gamebots2004. The software for this is installed only in EB 0.8, and you are expected to use the computers there. *If you want to use your own computer, you are solely responsible for trying to get that working, you will not get help from any of the teaching staff.* You will be able to explore the possibilities of UT2004, Gamebots2004 and BEHAVIOR ORIENTED DESIGN (BOD), utilizing the (ADVANCED BOD EDITOR (ABODE) in a practice scenario / tutorial on **Thursday, 21 March** where you receive a short introduction into the ABODE and Gamebots2004. You also have Friday the 22nd to familiarize yourself with the environment.

You will then participate in an experiment where you try to build a complex AI with multiple goals in a scenario given to you in-lab on **Thursday, 11 April**. *This will be a 3-hour laboratory session* running from 4:15–7:15. You will be allowed to choose between using BOD with pyPOSH, and writing your own bot in Python, or you may use any approach that you choose such as straight Java. The only limitations are that your bot is not allowed to use full information of the map or the opponents and that your resulting bot can be run on any of the available PCs in the lab without a complicated set-up. You will submit the resulting successful bot to your tutor at 7:15pm, after the experiment. The suggestion is that you explore the experimental environment on the 21st and the 22nd, then take a week to choose an approach and/or to write any other scaffolding software you think might help you *before* the assessment on the 11th.

2.2.1 Assessment A

You will get 60 points for completing the game AI in 3 hours that solves the scenario presented on the 11th with a successful agent. After submitting your agent at the end of the lab, it will compete against all other agents in a one-on-one ladder match (2-out-of-3 wins) run on the 12th. This ladder match will be run by the tutor, but you are free to watch if you like. The results of the competition will be presented on moodle so name your bot wisely. The top three bots will receive 10 additional points¹. It really is a competition.

For the remaining 30 points you will write a *less than one page, text only no figures* assessment of your outcome, the task, and the approaches. You should make 10 observations (please bullet point or enumerate them), and you will get 0, 1 or 2 points for each one. This is very like how your final exam will get marked, so this gives you practice on writing an essay aimed at making clear points. Points should all be supported somehow, either by:

- logical arguments,
- drawing from your experience, and / or
- drawing from literature or lecture

Obviously to fit ten on one page, each point should only be one or two sentences long.

2.2.2 Assessment B

If after the competition you do not want to be assessed on the basis of your performance, you are free to complete a scenario from the competition using any method, and then write up a report similar to how you have for the first two courseworks. You may use the code you have already written or start over, it is totally up to you. Please don't leave the assessment though until you have tried for three hours to complete, so that we can at least see which approach you chose and how it went for you.

3 Results

For Option 1, see Coursework 2. For Option 2-B, your results' quantitative metric will be defined by the scenario. It is quite possible though you may spend most of your space describing qualitative outcomes as a result of various approaches you have taken to the problem.

4 Discussion and Conclusions

Except for Option 2-A, these are per the instructions in Coursework 1.

¹Note that five students have previous experience with BOD from working on dissertations projects, so their scores will be averaged separately and if their mean is different than the class mean, a handicap will be applied.