3547 TERM PROJECT

The Project

The 3547 Term Project is your opportunity to showcase what you've learned in the course. Your objective is to design and train an intelligent agent using at least one of the following techniques for an application of your choosing:

- Tree or graph search
- Constraint satisfaction solving
- Genetic algorithms
- First order logic
- Semantic web
- Bayesian networks
- Reinforcement Learning

You may use libraries that support these techniques (i.e. you do not need to code everything from scratch). Feel free to use the Go playing agent code and repurpose it for another task. You can use any programming language you prefer. You may combine Deep Learning with the above but the agent may not rely solely on Deep Learning.

Some examples of projects that would be appropriate:

- An agent that:
    - learns to play Hexapawn perfectly on a 4 x 4 board
    - solves WumpusWorld near optimally
    - plays checkers or backgammon better than random legal move choice
    - solves Sudokus
    - generates or solves crossword puzzles
    - recommends an investment mix for a client based on a set of rules
- An "Artificial Life" arena with lifeforms that evolve using a genetic algorithm or two kinds of agents using different techniques battle with each other
- Modifying or extending the Go bot from the text in a non-trivial way

Topic Approval

Prior instructor approval of your choice of project is not required for any of the suggestions above. If you would like to undertake a significantly different project or present a research topic please submit your idea to the instructor via email for feedback and approval by Week 7 (and preferably earlier).

Group Submissions

You can submit either an individual or team project with up to three team members. Only one submission is required per team. The team members' names must be clearly marked on the submission.

Deliverables

There are two deliverables: a report and a presentation/demo. The report will be in the form of a writeup on your work and will include all of your code.

Requirements & Due Dates

Your project is due the second-last class of the term. The last two meetings of the term are reserved for presentations. If you have a preferred date to present please send an email to the instructor(s) with your preference. Otherwise a date will be assigned two weeks in advance of the first presentations.

The presentation should be five PowerPoint slides long (excluding title slide) and ideally include a demo of your agent if practical. You will only have five minutes to present (10 minutes for team submissions), which will go by quickly, so please rehearse and time your presentation in advance.

The presentation is due via upload to Quercus the day before you present so we won't lose time in class (for example, waiting for USB drivers to install).

Marking Scheme

Marks will be allocated as follows for a total out of 40:

- Difficulty/Novelty – 10 marks
    - How challenging a project was it?
    - Is this an interesting and different project?
- Report readability – 10 marks
    - Spelling
    - Explanation of use of technical terms
    - Formatting
    - Easy to follow
- Correctness and thoroughness – 20 marks
    - Explanation of the project objectives
    - Explanation of the specific techniques used and how they fit together
    - Explanation of engineering trade-offs made in designing the agent
    - Analysis of the performance of the agent