

CS 4701: Practicum in Artificial Intelligence
Spring 2017
Course Project Proposal

There will be a single programming project for CS 4701. The goal is to exercise knowledge you acquire from your AI courses (CS 4700 or others in our curriculum) through the development of a large-scale system. The major effort of the project should involve AI, as opposed to user-interface design, client-server software, etc. – beware, it is very easy to get sucked into programming effort that is not central to the goal of 4701.

Students should work in teams of 2. I strongly discourage groups of any other size, but if you think you have a compelling reason for wanting a different team size please check with me.

Your project will have the following milestones/assignments:

1. Saturday, March 18, 4:00pm: Teammate Selection

Submit your team composition in Gradescope. To do so, you will need to explicitly submit a file that should contain you and your teammate's name and NetID, one per line. Only one member of the team should submit this, and as part of the submission that student should click on the link to add group members. If you have not managed to find a partner by then please send me an email (haym.hirsh@cornell.edu) instead. There is no grade assigned to this other than simply following through on these instructions.

2. Friday, March 24, 12:00pm: Project proposals

You should submit your proposed project for the course. This proposal is intended to be short and to the point. It will be graded Satisfactory/Unsatisfactory. You may be asked to prepare a revision. Your proposal should have the following components:

- Title of your project
- Team member names with Cornell NetIDs
- A clear and concise description of what you plan to do (3-4 paragraphs)
 - o Make sure to include the general area(s) of AI you are exploring in your project (for example, Machine Learning)
 - o Also include the plan for evaluating your system – what questions you will ask about your system and how you will answer them (for example, how well your game playing program performs against human players selected according to a specific plan that you give)
- A timeline for your implementation *and* evaluation

3. Friday, April 21, 12:00pm: Status Reports

Provide an update on your work on the project. This will be graded Satisfactory/Unsatisfactory. You should include what you wrote in your original proposal and frame your status report in light of that. Please include the following information:

- Give an updated timeline that specifies what's been done, and what (if anything) you are changing in the timeline given what you've learned about the project thus far.
- Specify what changes you have needed to make to the project, such as its scope, how you are evaluating it, etc.

4. Monday, May 15, 11:35am: Final Project Report: GROUP

Your final submission should be a roughly 10-page paper. It should include the following:

- Say what you were hoping to do, and what you accomplished.
- Explain what AI ideas and methods were brought to bear in your system.
- Specify what questions you asked and how you evaluated them.

I encourage you to get feedback on your report from others before you submit it, so that my eyes are not the first to see it.

5. Monday, May 15, 11:35am: Final Project Report: INDIVIDUAL

Please separately submit a short (1-2 page) personal report on the project. It should include:

- Your contributions to the project
- Personal lessons learned

This will be graded Satisfactory/Unsatisfactory.

Aim high in your project: It is better to be mediocre on something ambitious than perform perfectly on something easy. Your project will be evaluated in terms of the effort put into it, the clarity of your writing and the project's ideas, and how well you evaluated the questions you posed about it.

Your project can be connected to something else you are currently doing. The only requirements are that (1) the work for the project must be disjoint from what you are doing elsewhere, and (2) all parties involved in the project are aware of its use in this fashion. It will be extremely important that you are clear what is distinct in this project compared to the work you would be doing otherwise.

You are given free reign to pick your project, but the following are examples of possible project topics:

- Game playing programs:
 - Backgammon
 - Blackjack
 - Checkers
 - Othello
 - Hearts
- Machine Learning:
 - Character Recognition
 - Forecast Financial Markets
 - Playing a Game
 - Learn Endgame Rules from Examples
 - Make Predictions by Mining Social Media
- Genetic Algorithms:
 - Genetic Programming
 - Learning Natural Language Grammars
 - Using genetic programming for the automatic generation of computer programs
- A theorem-proving system for some (small) subset of mathematics
- A program that generates automatic crossword puzzles, starting from a dictionary and an empty board
- A system that plays a game (such as Tetris)
- A system that plays the repeated prisoner's dilemma (see for example <http://serendip.brynmawr.edu/playground/pd.html>)