

# CCIS 4100 final project

## *guidelines, expectations/grading criteria and due dates*

### **Overview**

The aim of the project is to allow you to pick one topic in AI to pursue in more depth, and then actually build something cool related to it. The project should be interesting (primarily to you!) but modest enough in scope that you can complete it in the allotted time.

*Thoughts on coming up with a project idea.* You might start by picking an application you'd like to work on and then work backwards to figure out what methods/approaches might be suitable to solve it (or a special case/scaled back variant thereof). Alternatively, perhaps you are interested in some particular technique/approach and want to pick an application that will let you explore that further.

A few potential examples off the top of my head:

- A bot to play poker or some other card game; could set this up so that two bots play against each other in a mini-max framework.
- A scheduling program for some particular application of interest to you, using CSPs to satisfy constraints.
- A model to classify Tweets by topics or perform sentiment analysis.
- A reinforcement learning agent for an old-school video game (possibly building on the PacMan stuff you've already used, or maybe using the new, shiny and nifty-seeming [OpenAI Gym](#)).
- Using A\* to solve a practical search problem of interest to you.

Need more inspiration? Here are some previous projects from the Stanford AI class: <https://web.stanford.edu/class/cs221/sample-projects/>. Links to datasets, tools and similar info also available on the UCI AI course page: <http://www.ics.uci.edu/~smyth/courses/cs175/>.

One last thought on this: there are lots of fun projects that one could conceivably come up with relevant to what we have covered thus far (e.g., reinforcement learning projects, or game playing via minimax, etc.), but arguably a bit easier to conceive of concrete projects with suitable scope that use things we'll be covering in the next sections. In particular, projects involving *machine learning* may be particularly attractive; this is just something to keep in mind! You might read ahead a bit and talk to me about ideas to get an early start!

### ***Deliverables and details***

There will be four deliverables, with the total grading breakdown on the project will be as follows:

- (1) A brief **project proposal**. I will provide feedback on this and make sure what you propose is reasonable and in-scope. Due 4/04. **10%**
- (2) A **final write-up** describing the project aims/task you attempted to tackle (and the motivation behind why this is important; this can recycle material from the proposal), how you approached (what methods), and your results. Due 4/18. **60%**

- (3) Source **code** (and data, if any) you wrote for the project. Due 4/18. **20%**  
(4) A 2-minute **final presentation** in class. Due 4/18. **10%**

Details on these are provided below.

**Project proposal** is due Friday, 4/04. This should not exceed 1 page. It should contain a brief overview of what you're planning to do and how. Grading will be based on whether the proposal concerns a well-formulated, interesting (or at least practically useful!) problem and whether the high-level approach proposed sounds at least potentially feasible. The key to a good proposal is that it specifies, concretely, an **interesting** project that can **reasonably be completed** in the allotted time using a **specific AI approach**. There is plenty of time to float ideas by me before then – do this!

**Final write-up** Due 4/18. **Maximum 8 pages** (this is a maximum, not a minimum!). This should describe the entire project, from idea to execution to results. I suggest including (at least some subset of) the following sections, but this is not strictly required:

1. Abstract
2. Introduction and motivation
3. Problem statement
4. Approach/methods
5. Experimental setup
6. Results
7. Conclusions/Discussion

The reader should be able to appreciate what problem you aimed to solve, why you wanted to solve it and what AI method(s) you attempted to use to do so. You should assume the reader is unfamiliar with the AI technique you used, and explain it as you would to a smart colleague (i.e., fellow CS major who has not yet taken AI). You should report and discuss the empirical results (e.g., performance of your Pong playing agent, or whatever is appropriate in your case). You should conclude by discussing potential ways of improving upon your work.

In addition to assessing the clarity of the writing and presentation, grading criteria will reflect the interestingness of the project generally (unfortunately an admittedly subjective assessment, but I am happy to discuss!), the suitability of the approach selected and applied, and the execution of the approach. In some sense the grade will reflect how well the paper demonstrates that you were able to successfully apply an AI technology to your task, and/or that you attempted to innovate and adapt an algorithm meet the demands of your particular problem.

**Source code** All source code developed and used for your project. Grading criteria here will depend on the nature of the project, but largely reflect your successful implementation (or at least successful refinement of an implementation) of an AI technique, as applied to your project. Tangential coding effort (e.g., data massaging or code needed to interface with an old-school video game, or whatever) will also be taken into consideration, where appropriate!

**Final presentation** On the final day of class, you will perform a 2-minute “lightning presentation” showing off your project. This should serve as an “elevator pitch” for your work. Grading will be based primarily on clarity of presentation.