15-780: Graduate Artificial Intelligence
Course Projects

Important Due Dates

Unlike problem sets (where hard copies are turned in during class), all project update should be submitted as *attached PDFs* using Piazza. For these post, select the post type of "Note," post to "Individual Student(s)/Instructors()" (and type "Instructors" in the text field that comes up), and then attach the writeup *as a PDF* (do *not* submit Word files) to the post. Remember that you cannot use late days for the final project report.

- **2/26** – Initial project proposal (due by 1:30pm)
- **4/2** - Project milestone report (due by 1:30pm)
- **4/29** - Two slides for class presentation (due by midnight)
- **5/6** - Poster presentation (1-4pm, Gates 6th floor commons)
- **5/10** - Final project report (due by midnight)

Description

A major component of 15-780 is a course project that allows students to study an area or application of artificial intelligence in depth. Projects are to be done in groups of one or two, though in the case of group work each student is also required to submit a short writeup detailing which portions each member worked on.

The content of the course project is quite open ended: students are welcome and encouraged to tackle problems from their own research, or from other topics, using the techniques and methods taught in 15-780. Of course, students are also welcome to dive into a core algorithmic technique from the field of AI itself. Good projects will 1) discuss related work and the relevant literature on the topic of interest (all projects must cite at least four external sources), and 2) demonstrate that the student(s) looked at and considered different possible approaches, implemented and evaluated algorithms for the problem, and were able to

As with any research project, there is some chance that great ideas and a great deal of time investment ultimately don't produce results that improve upon the existing state-of-the-art. Although it is always exciting when students can push forward research in their field as part of these projects, this is not a requirement for receiving at A on the course project. Rather, in grading the projects, we will consider several factors

- Do the student(s) search out and understand existing work in the area? Do they situation their work within the context of the existing state of the art?
- Do the student(s) try out several approaches, demonstrating an effort to tackle the problem in different ways, and/or develop several different components to the system that integrate together?
- Are the ideas presented in the paper fully explained, implemented, and then evaluated?
- (For group projects only) Do both students in a group of two contribute equally to the project?

If you have questions or concerns about a potential course project topic, you should talk with one of the instructors during office hours as soon as possible. We are more than happy to discuss potential projects or point out relevant related work.

Proposal

The initial project proposal, due 2/26, must include 1) a list of the students participating in the project and project title, 2) a short (500 word max) written description of the project, and 3) at least two references to academic papers or books that you will be building upon in the project. The goal of the proposal is not to actually carry out the final work (though starting early is always a good idea), but to lay out a plan for the project so that we can make sure it is the right size and scope for the class. As mentioned above, these proposals should be submitted on Piazza by the start of class on 2/26.

The proposals are worth 10% of the total project grade, but you will receive full credit as long as you make an effort to address all the elements above. Since certain proposals may need revisions after first submission, the goal here is to make sure that you submit something we can give feedback about.

Milestone report

The milestone report, due 4/2, should describe the progress made on the project so far in a maximum of two pages. Since this date is roughly halfway between the proposal and the final project deadline, we expect you to be approximately halfway done with the project, and the report should reflect this. For instance, a good milestone report would describe what data and algorithms you are using for the project, include some initial results from the methods, and indicate directions that you want to explore for the remainder of the semester.

The milestone is worth 10% of the total project grade, but again you will receive full credit as long as you make a reasonable effort to accomplish the above; the goal is to give you an idea of the most difficult portions of the project, and allow us to give feedback.

Class and poster presentations

As part of the project, each team will present their work both during the final day of class, 4/30 (a very brief presentation meant to just highlight the work to all the students in the course), and in a poster session held during the normal class exam period from 1-4pm on 5/6.

For the final presentation, we ask that you submit **two slides** in PDF format to the instructors by midnight on 4/29. The slides should contain 1) the title of your project and your names; 2) a brief description of the problem you are investigating (could be a visual description to accompany what you will say, and/or a few bullet points); and 3) a brief description of the approach you take

to solve the problem (again, could be entirely visual, or a few bullet points). You will be able to talk for a maximum of **two minutes** about your project (and to ensure that everyone get the full amount of time to speak, we will be very strict with this limit), so please rehearse your presentation before class. For group projects, you may have one of the members give the whole presentation, or both may give the presentation.

The final poster session will take place in the Gates building 6th floor common area, from 1-4pm on Tuesday 5/6. For this presentation, you must preare a poster highlighting your work on the project. This will be a chance to highlight your work in a bit more detail than the presentation both to other members of the class and to the rest of the CMU AI community (who will all be invited to the event). You can print your posters using the SCS services (they will be notified that posters for this class are an acceptable use of the resources), with more information available here: `http://www.cs.cmu.edu/~help/printing/poster_printing.html`. The posters should be a maximum side of 30 in (height) x 36 in (width).

The poster and class presentation will be together worth 25% of the final project grade.

Final report

The final report, due *midnight* on 5/10, will be a five page writeup of the work you carried out for the project. Though we do need to limit the actual report to five pages, students may include additional materials in an appendix, such as describing approaches that did not work out, including code (if desired, this is not a project requirement), and including additional results. However, we make no promise to do anything more than skim any material in the appendix, so please do not use this simply as additional writing space; your five page written report should function as a standalone document.

For group projects, along with the final report we require that each student in the group submit a private message to the instructors on Piazza, detailing which portions of the assignment he or she worked on.