Project – 300 points total

Check the webpage (and Eagle) for due dates.

1. Proposal (50 points): Two page problem introduction (with references). Turn in a hard copy in class and submit a copy via eagle.
2. Elevator Speech – Progress report (30 points): a five minute verbal presentation of your proposal.
3. Report (200 points): If your paper is theoretical in nature, the write-up should be no longer than 10 pages. The format follows the ACM proceedings guidelines and consists of balanced double columns, 9 pt text, 1" (2.54cm) margins top and bottom, and 0.75" (1.9cm) margins left and right. Each column is 3.33" (8.45cm) wide with a separation of 0.33" (0.83cm).

If there are experimental results or a software artifact, the report will consist of two parts. The code and the write up. The write-up will consist of the introduction to the problem, a description of your experiment, and the results. The write-up should be no longer than five pages. Submit a copy via eagle.

4. Presentation (20 points) You will present your results during the final examination period. Plan on about a ten minute time period (and about 6 power point slides) with five minutes for questions. You may want to demonstrate your program, if appropriate. See the presentation grading guide so you know how it will be graded.

Introduction to Project

As we study various subjects in class, find an area (listed in the course topics) in which you think you could add to the current research. Selecting the area is probably the most important part of the project. If you can find something you have some ideas about, the rest will be much easier.

The goal of the project is to try to do something novel, rather than merely a survey of existing work. Projects may be theoretical, experimental (based on simulations), experimental (based on real-world data), a useful software artifact, or any combination thereof. Creativity is encouraged.

Proposal (Due October 22)

The research proposal should be written well enough to be used as the problem statement your final paper. In your project proposal, you should explain the topic of your project, what types of results you hope to obtain, and what some of the technical issues are that you will need to address. Something related to your own research is definitely OK as long as it also has something to do with the course material. An intermediate project


**progress report** is also required. This report should explain what results you have obtained already, what (if any) difficulties you encountered, and what you plan to do to complete your project. Ideally, at this point, you should already have some good results, so that you can spend the rest of your time on answering questions generated by your results, as well as preparing your writeup and presentation.

Read at least two to three important papers in the area you have selected so you become familiar with what has been done. (You will likely read MANY more papers in deciding what to pursue.)

**Elevator Speech – Intermediate Progress Report (Due November 19)**

This is an oral, 5 minute presentation of what you have accomplished so far. No powerpoints or visuals are used for this. Two points need to be clear:
- How your research project is related to game theory.
- What you have accomplished so far. Merely giving an overview of the topic is insufficient.

**Report (Due December 15th)**

You will write up your experiment in a form containing the following:

- A description of the problem and its importance.
- The experimental design
- The results of your experiment
- Future work

Clearly identify the original parts of the research project. While it is not expected that you will have completed a research project, you should have some original ideas. You should have explored the ideas well enough (through reading and implementation) that you are reasonably certain they are worth pursuing. I am hopeful that a few of you will actually use this mock paper as a springboard to an actual research project.

**Presentation (Due December 13th)**

The presentation will be given during the final examination period. Presentation guidelines can be found on the class webpage.

**How to Do Research**

1. Be efficient. There will be lots of articles to pick from. Read the abstract and conclusion first to determine if the paper is one you want to read.
2. Plan on reading most things only once. Really good material will require you to go back and reread it (perhaps several times), but lots of things can be
summarized fairly well with one reading. If you have a paper copy of the article, highlighting key phrases is helpful. If you have an electronic copy of the paper, creating a file of notes for each paper (giving complete reference, basic ideas, and your reaction to them) can save a lot of time. Summarize as you read. Write down the strengths and weaknesses of each paper after you read it. Also, jot down ideas that you have for improving upon the work.

3. What makes a good topic? I would go for something that is interesting to you. Other criteria are: understandable (something you have the background to read), easy to find material, lends itself to implementation, something you have your own ideas about.

4. Have a plan. Ask yourself, “How would I demonstrate to others that my ideas are valid? If I could show these results, why would anyone care?” Pick an area that is important for some reason. Tweak what has already been done to create something original. Design tests to validate your ideas.

Project Report and Presentation

1. Prepare a six slide powerpoint presentation to highlight your work.
2. Turn in your report (both hardcopy and electronic).
3. Organize your report using subheadings. Include the following sections: Introduction, Experimental Design, Results, Future Work.
4. Have a major point to your paper. Just like a good mystery leaves clues throughout the book, your paper should constantly gives clues as to where you are going and why the topic is important to the goals of the paper. Don't just present a concept or a result and assume the reader understands the importance. Clearly state what you believe to be true.
5. Present the concepts in a logical manner so that it might be comprehended by someone who has not studied the papers for two months.
6. Have at least two important references with recent publication dates. Not everything you find in print has the same value. You need articles that appear in peer-reviewed publications (of the type found on IEEE or ACM digital libraries) rather than articles in trade magazines.

While brilliant, well-read researchers could possibly independently think great thoughts and count it as research, students in a university class do not have that luxury. The research topic will be judged by showing the problem is important and interesting to those doing research in the field. This is done by citing recent research papers published in prestigious conferences.

7. Give credit for ideas by referencing the work. See a major CS journal for an illustration of how this is done.
8. Use common terminology. Don't make up new terms for common ideas. If the various papers are inconsistent in terminology, you must decide which terminology you will use throughout the paper. The reader is more concerned that
you are consistent within your paper than that you use the notation used by the original author.

How to Find Articles

1. The ACM digital library is an excellent, searchable source of peer-reviewed articles. USU libraries has paid for the service so that you can access it without paying. Here is the link to ACM digital library from the USU library website. USU students have free access to the ACM digital library.

2. The IEEE digital library is also an excellent, searchable source of peer-reviewed articles (free to USU students). Anyone can use the search facilities without paying the fees - and then look up the articles from the paper copies in the library. Here is the link to IEEE digital library.

3. If you know the names of the key researchers in the area, you can do a google search to locate their homepages. Often their recent publications are listed. If they don't have links to the copies of the paper, you can email them and ask for a copy. (Obviously you would only do this for journals not carried by the library.)

4. Once you find one article you like, look for more references at the end of that article.