

# COMPSCI 271 - Final Project

Due date: Dec. 3

## 1 Project Scope

For this project you will evaluate a machine learning technique theoretically, or on some benchmark or real world data. Acceptable projects include the following:

1. Proving a new theorem about an existing learning method (ambitious).
2. Proposing a modification to an existing learning method and evaluating this modification against the standard method on several benchmark data sets.
3. Developing a hypothesis about how different learning methods compare and evaluating this hypothesis using these learning methods on many different benchmark data sets.
4. Proposing an application of machine learning to an interesting problem that you care about, selecting a method, doing your best to make it work, and discussing the results.

This is only a partial list. Other ideas are also possible if you clear them with me first.

## 2 Project Proposal

You should turn in a proposal for your project to me (email is fine) *no later than October 1*. This should be a less than one page description of what you plan to do. You are, of course, free to turn in a proposal earlier. I understand that you won't know a lot of machine learning techniques yet, so your proposal should focus on the general problem you hope to solve and it is OK to have only a vague idea of which techniques might be useful at this point.

I will give feedback on your proposal after Fall break.

## 3 Project Milestone I

No later than *October 20* you should turn in an approximately one page description of the progress you have made since your proposal. This is your opportunity to document your initial efforts and identify areas where you think you might need help.

You should identify *at least 3 papers* that you expect to be citing in your final write up. This will help me suggest related papers that you might have missed.

This will not be graded, but if you miss this opportunity I will be less sympathetic about last minute problems that arise. (NB: They almost always do.)

## 4 Project Milestone II

No later than *November 19* you should turn in an approximately one page description of the progress you have made since Milestone I. You should aim to have most issues in your project ironed out by now. This means that you should be finishing up any coding you need to do and you should be collecting your preliminary results.

Why so early? Things always go wrong. This is your last opportunity to get help on saving a project that is in trouble. Again, this will not be graded, but it's an opportunity you should not miss.

## 5 Project Write Up

By *December 3*, turn in a document describing your efforts and a link to any code you've produced. As a rough guideline, you should aim for a writeup of 10-15 single column, double spaced pages. However, I won't be counting pages and this is only a very rough guideline. You shouldn't pad your writeup with worthless text to reach this size. If you can describe what you've done clearly and concisely in much less space than this, that's great. I'll expect your writeup to address (at least) the following issues:

1. What problem does your project address? If you have chosen an application area, please remember that I may not be an expert in the application you have chosen, so be sure to describe the application area clearly.
2. What methods did you use to address the problem?
3. What is the reason you picked the methods you picked? Can you justify theoretically or empirically that this was the best choice?
4. How did the machine learning techniques that you applied perform?
5. How did you validate your results, i.e., what were the training and test sets?
6. What difficulties did you encounter and how did you try to overcome them?
7. What would be the next step if you were to extend this project?
8. What did you learn from this?

Remember to include a complete bibliography.

Note that it is not a requirement for a good project to have successful experimental results. Sometimes things don't work out as you planned. Your grade will be based upon your scholarly and insightful application of the things you have learned in class.