Course Project

Due June 15, 2006

By the end of the course, you will have learned a good deal about graphical models and algorithms for their manipulation. The goal of the project is for you to demonstrate and solidify your understanding. There are two primary types of projects:[1]

- Demonstration of the application of graphical models to a graduate-level problem.
- Implementation of an algorithm either only marginally discussed in class, or not covered in class

The former is more straight-forward and will probably serve you better and be easier. I encourage your look at your current research (if it is outside the traditional boundaries of AI, that's even better) and use this project as an opportunity to see how graphical models could solve a subproblem of your own research.

Many of the algorithms discussed in class are straight-forward to describe, but difficult to implement efficiently. If you are selecting the first option above, you may employ software available on the web. *Genie & Smile* is a software suite available from `http://genie.sis.pitt.edu/` that implements Bayesian network inference and comes with a Windows graphical interface (which is useful for getting a feel for the algorithms, although the base library is better for automating tasks). Intel is developing a Bayesian network library as well. It contains more algorithms, but is less friendly and some of it currently still being developed. It can be found as part of their OpenCV package at `http://www.intel.com/technology/computing/opencv/index.htm`. Finally, Kevin Murphy wrote a Bayesian network toolbox in Matlab (`http://bnt.sourceforge.net/`). It might be the simplest approach, although it does not have a graphic interface. There may be others available, but these are the three of which I'm aware.

The second option (of implementing an algorithm only marginally discussed in the course) is perhaps a little more difficult and will require testing of some form. It will require a little more "reading ahead" to determine what algorithms will be covered and what interests you.

Proposal: You should submit a 1-2 paragraph description of your intended project by May 4th (the Thursday of the 5th week of classes). Before that time, you should meet with me one-on-one to go over your idea. That will give me a chance to iron out and potential problems. By the 5th week of the course you should have some idea of what is possible and feasible and what is not. However, I am happy to help you iterate toward and interesting and doable project.

Final Project: By June 15th, you need to turn in your final project. On average, I would expect a 3-to-4 page write up of your results. Each project may be a little different, and we can work together to figure out what an appropriate write-up would be before the proposal.

Groups: Groups of 2 are fine for this project. If given an extraordinary reason, I might allow a group of 3 students. If two students wish to work on the same project, I will expect the problem to take twice the effort and be twice as difficult. One example would be if two student joined forces in implementing an algorithm and applying it to a interesting problem domain.

[1] If you can think of something that doesn't fit into these categories, you may discuss it with me to see if it would be acceptable.