Syllabus for Psychology D59:
Computational Models of Memory and Attention

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Classes are Fridays (10 am until noon) in room R3230.

General Course Overview

The purpose of this course is to introduce you to the way in which computers have been used to build explicit cognitive models of the processes and representations underlying human memory and attention. We will discuss several memory and attention phenomenon, then focus on computational models of those phenomenon and the debates and discussion arising from those models. My hope is that the course will not only expose you to the practice of computational modeling, but also to the interactive nature of scientific research.

Readings

There is no textbook for this course, but there will be substantial reading of journal articles. The articles will be placed on reserve at the library well in advance of the classes relevant to them.

Class Format

Classes will be partially seminar style, and partially lecture style. Specifically, one person from the class will be expected to present one of the articles each week. The presentations should take between 30 minutes to an hour. After the presentation, I will lecture a bit to try to tie in that day's reading(s) to the bigger picture I am trying to communicate.

Evaluation

Your mark in this course will be comprised of a number of different things as outlined below:

Presentations (20%). Depending on the size of the class, each student will be required to do 2 or 3 presentations throughout the course of the term. A good presentation not only describes the work, but also highlights relevant issues for discussion. The presenter may wish to state what they see as the critical issues and express their opinions on them as a way to provoke discussion. My hope is that the presentations, and the class in general, are interactive. Thus, presentations will be marked on the basis of being clear, correct, and "interesting". We will figure out the precise dates of your presentations during the second class (i.e., Friday, September 19th).

Thought Papers (25%). Students who are not presenting on a given week are required to hand in a "thought paper" on the readings which should be a one page discussion of ideas or thoughts the student had while reading. These are not supposed to be summaries, but instead are supposed to show signs of original thought. Thought papers are due at the beginning of the class each week.

Short Project (10%). Fairly early in the term there will be a short programming assignment in which you have to program, from scratch, a very simple neural network model. The purpose of the assignment is to demonstrate how a simple model can produce complex behaviour. This project is due on Friday, September 26th.

Long Project (25%). Due on the last day of the term will be a larger project that can take one of a number of forms. It can either be a unique investigation of a simple computational model that you have coded from scratch (embedded in a proper APA manuscript), or it can be a similar investigation of a more complex model using some higher level simulation package. In either case, the goal of the project is to give you hands on experience with models and a chance to employ some creative thinking. This project will be due on Friday, November 28th.

2 Exams (10% each). At the end of each of the memory and attention sections there will be an exam consisting of 5 short answer questions that are aimed at assessing your conceptual knowledge of the issues described in the class. Both exams will be "in class".

Your results from one of the exams, the short project, and part of your presentation and thought paper mark will be provided to you a week prior to the drop date so that you can make an informed decision at that time.