Simulation research is gradually taking hold within sociology, and with reason: simulations can model processes that are theorized by sociologists – related to emergence, unintended consequences, nonlinearity, and complexity – but that are difficult to study using traditional quantitative methods. At the same time, there is little consensus, least of all within sociology, regarding the epistemological and methodological nature of simulations, which, after all, are a far cry from the sorts of direct empirical research that sociologists rightly value. Thus one of the primary concerns in this class will be to determine what place simulations, along with other forms of mathematical modeling, have in sociological (and more generally, social-scientific) research. Readings will be drawn from a range of social sciences, on topics including disease transmission, network dynamics, organizations, and collective action. Additional readings will be drawn from the natural sciences for whatever guidance these can provide. Major themes to be discussed will include the criteria of internal and external validity, the desirability of model simplicity vs. complexity, the role of parameters, the place of initial conditions, and the potential of simulation research to contribute to prediction, explanation, and theoretical development.

**Course info**
Semester: Fall 2004
Instructor: David Gibson
Time: Thur., 12-2 p.m.
Location: 601 WJH
Web page: www.courses.fas.harvard.edu/~soc273/
Office hours: Wed. 1-3 or by appointment, in 564 WJH

**Texts at Coop**

Other readings can be found under “Readings” on the course web site—open “reading links” for links to pdf files. Others are “to be distributed”; the mechanism for this will be explained in class. The books are also on reserve in the WJH library. If you have difficulty accessing the articles (as non-Harvard students might), contact the instructor.

**Requirements**
Attendance and Participation (20%)
Performance as discussion leader (5%)
End-of-semester presentation (5%)
Final paper (50%)
Memos (20%)

**Attendance and participation**: Students are expected to attend class, and to participate in class discussions. Intelligent participation requires that you keep up with the reading, and that you read one another's memos (see below).

**Discussion leader**: One student will serve as discussion leader each week. This person will be responsible for starting the discussion with a short (approx. 15-30 minute) presentation of main ideas, findings, and questions raised by these.
Final paper: You will write a final paper of approximately 20-25 pages in length, based on your own small-scale simulation (or other sort of computational) project. The simulation need not be sophisticated, and you are free to program it in whatever language or software package you want. An additional Friday meeting will be scheduled during which Cheri Minton and I will talk about simulation basics and language/package options. These are due on January 14th.

Memos: Each student will submit, by 3:00 p.m. of the day before class, a one-page memo reflecting on some aspect of the assigned readings. The memos will be posted onto the class web page (under “Memos”), and you will be expected to read one another’s memos in advance of class. These memos are not to exceed one page, with one-inch margins and 12-point font, though they may be single-spaced. (Longer memos will be submitted to Word’s Autosummarizer for condensing, and thereby rendered both unrecognizable and indecipherable). They should contain your best idea about one or more of the readings, and should be written as clearly as possible. I will grade the memos on a check, check-minus, check-plus basis. Most memos will receive a check, representing an A-/B+ (90%) grade. You only get a check-plus if your idea is so good I wish I’d had it, and is well-written to boot.

A note on readings: Simulations are complex, but generally not in the sense of involving complex math. (More mathematical will be some of our non-simulation readings.) If you come across some math that you can decipher, it’s often worth trying to, but if this is a futile (or even especially time-consuming) effort, skip it and keep reading. Our discussions will rarely revolve around such details anyhow.

Schedule

A. INTRODUCTION

Sept. 23. Introduction to the course
  * syllabus
  * scheduling of discussion leaders
  * point of departure: statistical models
  * recurring issues

Sept. 30. An overview and a case-study
  Joshua Epstein and Robert Axtell, Growing Artificial Societies.

Oct. 7. Cooperation


Oct. 21. Network evolution (and a paper on simulation methodology)


Suggested:


Oct. 21, 2:00-3:30: Programming tutorial with Cheri Minton.

Oct. 28. Network diffusion and search


David Gibson, “Concurrency and Commitment.”

Recommended:

**Nov. 4. Organizations**


**Nov. 11. Veterans’ Day – read Gottman**

**Nov. 18. Excursus: non-linear modeling**


**Nov. 25th. Thanksgiving – work on your final projects!**

**Dec. 2. Social movements and collective action**


**Recommended:**


Dec 9. Macro-evolution/devolution


Dec. 16. Student presentations

Dec. 17. *(Friday—to be scheduled)* Student presentations, cont.

Final paper due on Jan. 14th.