Course Description

Social network analysis focuses on relationships between or among social entities. This course presents an introduction to advanced concepts, methods, and applications of social network analysis used in the social and behavioral sciences. The primary focus of these methods is the statistical analysis of relational data measured on populations of social actors. The first week focuses on methods to adapt standard regression techniques for social networks. This includes the network autocorrelation model, the quadratic assignment procedure, and the broader class of baseline models. The second and third weeks are devoted to introducing and working with the Exponential Random Graph model (ERGM). Extensions to bipartite graphs, multiplex networks, and valued networks will also be covered. A comparison of the current software (statnet for R and PNet) will be covered, as well as how to write your own terms. The final week will be devoted to longitudinal models focusing on temporal ERGMs and the Actor Oriented model.

Finally, while students are not required to bring their own data or projects, this is very much encouraged. I will ask about ongoing projects at the beginning of the course, and the last afternoon is reserved for students to present what kinds of ideas they’ve developed for their own research. There are three homework assignments that focus on the analysis of a network or set of networks. These can be data supplied by the student or I can provide additional data.

Computer Programs

The R statistical programming package is required to follow along with the course material. It is freely available at the website below. I suggest also downloading R Studio. This is not necessary, but helps to organize the R windows and is an easier interface. It is also free. In addition to the base packages you install with R, we will also use additional packages. If possible, please download them prior to the start of the class.

R (statistical programming language)

http://cran.r-project.org/

R Studio (a user interface that’s pretty nice and I will use in the workshop)

http://www.rstudio.com

And the statnet, network, ndtv, sna, MASS, numderiv, coda, nlme, and trust packages for R available from cran

Other Resources

These are some especially useful resources on social networks. I encourage you to explore them and to take advantage of what they have to offer.
The International Network for Social Network Analysis (INSNA) is the international and interdisciplinary professional association for people interested in social network research. Its website (http://www.insna.org) is a great source of information and resources on social networks, including links to many informative sites and to social network computer programs and data.

The listserv, SOCNET, is the main on-line forum for discussion of current topics on social networks. Information on how to join is available through the INSNA site (see above) or at: http://www.insna.org/pubs/socnet.html

*Social Networks* – the flagship journal of the discipline.

*Connections* is INSNA’s newsletter/informal journal. It is available through the INSNA website or directly at: http://www.insna.org/pubs/connections/index.html

*Journal of Social Structure* is an online journal with many articles of interest to social network researchers. http://www.cmu.edu/joss/

Steve Borgatti’s web page is a nice source of introductory material and handouts on various topics on social networks. http://www.analytictech.com/networks/

Bob Hanneman at UCR has a useful online textbook on social network analysis that includes information about how to use UCINET

http://www.faculty.ucr.edu/~hanneman/nettext/

Data examples from Wasserman and Faust are available at:
http://vlado.fmf.uni-lj.si/pub/networks/data/WaFa/default.htm

Carter Butts’s R routines for social network analysis
http://erzuli.ss.uci.edu/R.stuff/

Miscellaneous social network data and information about Pajek from the Pajek sites
http://vlado.fmf.uni-lj.si/pub/networks/data/esna/default.htm
http://vlado.fmf.uni-lj.si/pub/networks/data/

data with the Siena package
http://www.stats.ox.ac.uk/~snijders/siena/siena_datasets.htm

valued network data from Tore Opsahl’s site
http://toreopsahl.com/datasets/
Readings

I will prepare a google drive file with all of the readings and they will be available on a thumb drive during the first day of class. The schedule will roughly follow one reading per day.

Week 1

Week 2

Week 3

Week 4
Assignments

Three assignments will be due by the beginning of class on July 25th, Aug 1st, and Aug 8th. The first two will be to use methods from the previous week to analyze a dataset of your choice. The final paper can be either to attempt some of the more advanced methods covered (longitudinal, multiplex, etc.) or to revise one of the earlier two assignments. Students who do not have their own data to analyze should speak with me and we will find a dataset of interest.