Network Analysis: A First Course
(Four day workshop)
May 29 - June 1, 2012

Instructors: Hank Green, Rand Corporation
hankgreen@gmail.com
Stanley Wasserman, Indiana University Bloomington
stanwass@indiana.edu

Lab Assistant: Ann McCranie, Indiana University Bloomington
amccranie@gmail.com

Course Description
Social network analysis focuses on relationships between social entities. It is used widely in the social and behavioral sciences, as well as in political science, economics, organizational science, and industrial engineering. The social network perspective, which will be taught in this workshop, has been developed over the last sixty years by researchers in psychology, sociology, and anthropology. The social network paradigm is gaining recognition and standing in the general social and behavioral science communities as the theoretical basis for examining social structures. This basis has been clearly defined by many theorists, and the paradigm convincingly applied to important substantive problems. However, the paradigm requires a new and different set of concepts and analytic tools, beyond those provided by standard quantitative (particularly, statistical) methods.

This workshop, which has been taught in this format since the mid-1980’s, focuses on precisely those concepts and tools. This four day workshop will present an introduction to various concepts, methods, and applications of social network analysis drawn from the social, and behavioral sciences. The primary focus of these methods is the analysis of relational data measured on groups of social actors. Topics to be discussed include an introduction to graph theory and the use of directed graphs to study structural theories of actor interrelations; structural and locational properties of actors, such as centrality, prestige, and prominence; subgroups and cliques; equivalence of actors, including structural equivalence, blockmodels, and an introduction to role algebras; an introduction to local analyses, including dyadic and triad analysis; and a brief introduction statistical global analyses, using models such as $p_1$, $p^*$, and their relatives. Brief introductions will be given to common networks software packages: UCI net, Pajek, STOCNET, and pnet (if time permits). This is a workshop designed for people more interested in learning methodology than theory (we sort of assume that you already have some knowledge of network theory). It assumes a familiarity with matrix algebra and statistics. And lastly, because this workshop is the first of a two-workshop package, we will be able to continue the first workshop material during the second workshop.

Schedule
The workshop will meet for about seven hours each day with a 75 minute break for lunch at University of Michigan, according to the following schedule:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>Lecture (Green and Wasserman)</td>
</tr>
<tr>
<td>Early afternoon</td>
<td>Computing and Data Analysis (McCranie)</td>
</tr>
<tr>
<td>Late afternoon</td>
<td>Questions and Discussion (Green, McCranie, and Wasserman)</td>
</tr>
</tbody>
</table>
On Thursday evening we will organize an outing to a local pub for socializing. And usually, ICPSR holds a reception for us on the first afternoon after class.

**If you would like to schedule time to talk to the instructors about your own data or projects, please talk to us early in the week.**

**Course texts**

There are two particularly helpful texts for this class. The Wasserman & Faust text will be primary.


Additionally, you may find the following texts helpful:


**Topics to be taught** from Wasserman and Faust include:

Chapter 1: Introduction
Chapter 2: Social Network Data: Collection and Applications
Chapter 3: Notation for Social Network Data
Chapter 4: Graphs and Matrices
Chapter 5: Centrality, Prestige, Prominence, and Related Concepts
Chapter 7: Cohesive Subgroups
Chapter 9: Structural Equivalence
Chapter 10: Blockmodels
Chapter 13: Dyads
Chapter 15: Statistical Analysis of Single Relational Networks

These chapters will be augmented with readings from Carrington, Scott, and Wasserman, especially Chapters 8-10.

**Please review chapters 1-4 of Wasserman and Faust before you arrive in Ann Arbor.** We will zip through this intro/beginning material, and it would be good if you had a headstart. **If you have**
more time, you can read the first four chapters of Kadushin’s new book.

Computer Programs
We will be using a number of different social network analysis computer programs. All of these are available in the computer labs. All but UCINET are freely available on the web.

- UCINET, available in computer labs and for purchase from Analytic Technologies: [http://www.analytictech.com](http://www.analytictech.com)
- Pajek: [http://pajek.imfm.si/doku.php?id=download](http://pajek.imfm.si/doku.php?id=download)
- Netdraw, comes with the UCINET package or individually at: [http://www.analytictech.com](http://www.analytictech.com)
- Statnet Package in R: [http://csde.washington.edu/statnet/](http://csde.washington.edu/statnet/)
- Network Workbench: [http://nwb.slis.indiana.edu/download.html](http://nwb.slis.indiana.edu/download.html)

Other Resources
These are some particularly useful resources on social networks available online.
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://insna.org](http://insna.org)) is a wonderful 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](http://www.insna.org/pubs/socnet.html)

*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](http://www.insna.org/pubs/connections/index.html)

*Journal of Social Structure* is a peer-reviews online journal with many articles of interest to social network researchers. [http://www.cmu.edu/joss/](http://www.cmu.edu/joss/)

Complexity and Social Networks Blog ([http://www.iq.harvard.edu/blog/netgov/](http://www.iq.harvard.edu/blog/netgov/)) is a new “on-line journal” devoted to network analysis.

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/](http://www.analytictech.com/networks/)

Data examples from Wasserman and Faust are available at the INSNA website.