Social network analysis focuses on relationships between and among 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 the theoretical and formal basis for the relational study of social structures in the social and behavioral sciences. The theoretical and methodological basis for this paradigm has been clearly defined, and it has been convincingly applied to a variety of substantive problems. However, a network approach requires a set of concepts and analytic tools, beyond those provided by standard quantitative (particularly, statistical) methods. These concepts and tools are the topics of this workshop.

This one-week workshop presents 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 matrices and graph theory and their use in studying structural properties 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 triadic analysis; and statistical global analyses, using models such as $p_1$, $p^*$, and their relatives. Prerequisites for this course are familiarity with matrix algebra. A background in linear models and categorical data analysis will be helpful, but is not required.

The course will meet for about seven hours each day, according to the following schedule:

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morning</td>
<td>Lecture</td>
</tr>
<tr>
<td>Early afternoon</td>
<td>Computing and Data Analysis</td>
</tr>
<tr>
<td>Late afternoon</td>
<td>Questions and Discussion</td>
</tr>
</tbody>
</table>

Course Texts


Recommended:

**Topics**  Topics to be taught and the relevant chapters from Wasserman and Faust are:

- 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

**Computer Programs**

We will be using a number of different social network analysis computer programs.

- UCINET from Analytic Technologies. A trial version is available for free.
  
  [http://www.analytictech.com/archive/ucinet.htm](http://www.analytictech.com/archive/ucinet.htm)

- NETDRAW from Analytic Technologies, comes with UCINET or separately from
  

- Pajek at:
  
  [http://pajek.imfm.si/doku.php?id=download](http://pajek.imfm.si/doku.php?id=download)

- StOCNET from
  
  [http://stat.gamma.rug.nl/stocnet/](http://stat.gamma.rug.nl/stocnet/)
Other Resources

These are some especially useful resources on social networks.

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 useful 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

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

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

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

Robert Hanneman and Mark Riddle’s 2005 one line textbook Introduction to Social Network Methods http://faculty.ucr.edu/~hanneman/nettext/ includes many illustrations using UCINET.

Data examples from Wasserman and Faust are available at the INSNA website. http://www.insna.org/software/public_data.html

Further Readings

1: Introduction to Social Networks and Network Applications

Wasserman and Faust, Chapters 1 and 2


Hawe, Penelope, Cynthia Webster and Alan Shiell 2004 “A glossary of terms for navigating the field of social network analysis” J Epidemiol Community Health 58: 971-975


2: Representing Networks: Graphs, Matrices, and Network Visualization

Wasserman and Faust, Chapters 3 and 4
Freeman, Linton “Visualizing Social Networks” Journal of Social Structure, available at: http://www.cmu.edu/joss/content/articles/volume1/Freeman.html


McGrath, Cathleen, Jim Blythe, and David Krackhardt “Seeing Groups in Graph Layouts” available at http://www.andrew.cmu.edu/user/cm3t/groups.html

3: Graph Theory for Network Analysis

Wasserman and Faust, Chapter 4


4: Centrality and Centralization

Wasserman and Faust, Chapter 5


5: Cohesive Subgroups and Two Mode Networks

Wasserman and Faust, Chapters 7 and 8


6: Equivalences and Blockmodels, Network Roles and Algebraic Models

Wasserman and Faust, Chapter 9, 10, and 11


7: Subgraphs: Dyads, and Triads

Wasserman and Faust, Chapters 6, 13 and 14


8: Multiple Relations, Testing Hypotheses about Social Networks


9: Statistical Models

Wasserman and Faust, Chapter 15
