

## 1. Introduction to the Analysis of Network Data via UCINET and NetDraw

### Stephen Borgatti

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Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm, Wednesday, March 11<sup>th</sup>, 9:00am - noon (Students \$50, all others \$100)

**1-** A beginner's tutorial on the concepts, methods and data analysis techniques of social network analysis. The course begins with a general introduction to the distinct goals and perspectives of network analysis, followed by a practical discussion of network data, covering issues of collection, validity, visualization, and mathematical/computer representation. We then take up the methods of detection and description of structural properties such as centrality, cohesion, subgroups, cores, roles, etc. Finally, we consider how to frame and test network hypotheses. An important element of this workshop is that all participants are given a demonstration version of UCINET 6 for Windows and the Netmap visualization software, which we use to provide hands-on experience analyzing real data using the techniques covered in the workshop. In order to participate fully in the workshop, participants should bring laptop computers so that they can run the analyses on their machines at the same time as they are being demonstrated by the instructors.

## 2. Pajek workshop: Analysis of Large Networks

### Vladimir Batagelj

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**2a - First part:** Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm, (Students \$30, all others \$50)

**2b - Second part:** Wednesday, March 11<sup>th</sup>, 9:00am - noon (Students \$30, all others \$50)

**2a+b:** both sessions (Students \$50, all others \$85)

Pajek is a program for Windows for analysis and visualization of large networks. It is free for noncommercial applications and can be downloaded from its [home page](#). To actively follow the workshop, **participants are expected to bring their laptops**. The workshop consists of two parts.

**2a - First part: (Tuesday afternoon) Introduction to Pajek.** In the first part we will give an introduction to the use of Pajek based on our textbook on social network analysis 'Exploratory Social Network Analysis with Pajek'. At the end some hints on converting excel/text file datasets into Pajek format (using Jurgen Pfeffer's program Text2Pajek) and on exporting networks to different output graphics formats will be given. **2b - Second part: (Wednesday morning) Advanced uses of Pajek.** In the second part we will present some efficient approaches (valued cores, triangular and short cycle connectivity, citation weights, pattern search, generalized blockmodeling, islands) to analysis and visualization of real-life large networks. We will also demonstrate some newest additions to Pajek: network

multiplication and kinship relations, (p,q)-cores and 4- rings weights in analysis of two-mode networks, matrix display of dense networks, linking network visualizations to Internet, and clustering of large datasets with relational constraint.

### **3. The Analysis of Longitudinal Social Network Data using SIENA**

**3a. Introduction to models for network dynamics and working with the *SIENA* program.**

**3b. Models for dynamics of networks and behavior; and other more advanced topics.**

This workshop has two parts: interested persons without previous experience are advised to follow **3a** and (if they wish) **3b**; those with previous experience can choose to follow **3b** only.

**Tom Snijders**

University of Oxford and University of Groningen

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**Christian Steglich**

University of Groningen

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**3a - First part:** Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm (Students \$30, all others \$50)

**3b - Second part:** Wednesday, March 11<sup>th</sup>, 9:00am - noon (Students \$30, all others \$50)

**3a+b:** both sessions (Students \$50, all others \$85)

This workshop is about statistical inference for longitudinal observations on social networks. Longitudinal social network data are understood here as two or more repeated observations of a directed graph on a given node set (usually between 30 and a few hundred nodes). The workshop teaches the statistical method to analyze such data, as described in Snijders (2005) and Snijders, Steglich & Schweinberger (2006), and implemented in the SIENA program. The statistical model used for the network evolution allows to include various network effects (reciprocity, transitivity, cycles, popularity, etc.), effects of individual covariates (covariates connected to the sender, the receiver, or the similarity between sender and receiver), and of dyadic covariates. One interpretation of this model is an actor-oriented model where the nodes are actors whose choices determine the network evolution. An important extension is to have, in addition to the network, one or more actor variables that evolve in mutual dependence with the network; an example is a friendship network of adolescents where drinking behavior is a relevant actor variable which influences, and is influenced by, the friendship network. This leads to models for the simultaneous dynamics of networks and behavior, which are a special option in SIENA.

Further information about this method, including references and a JAVA demo, can be found at the SIENA website (see below). The statistical analysis is based on Monte Carlo simulations of the network evolution model and therefore is a bit time-consuming. The computer program SIENA is included in the StOCNET package which runs under Windows. The workshop will demonstrate the basics of using StOCNET and SIENA.

Attention will be paid to the underlying statistical methodology, to examples, and to the use of the software.

The first session (**3a**, Tuesday afternoon) is intended for those without previous experience with this method, and will focus on the intuitive understanding of the model and operation of the software. The second session (**3b**, Wednesday morning) is intended for those with previous experience with the method and the software, and also for those who followed the first session. will present models for the simultaneous dynamics of networks and behavior and other more advanced topics such as model specification, structurally determined values, and models for nondirected relations.

Participants are requested to check the SIENA website in the week before the workshop to download the workshop materials. For optimal benefit, it is advisable to bring an own laptop with StOCNET already installed, such that some steps of data manipulation and analysis can be followed hands-on.

SIENA website: <http://stat.gamma.rug.nl/siena.html>

#### **4. The Practice of Exponential family Random Graph (ERG or $p^*$ ) modeling: A Practical introduction to Exponential family Random Graph Modeling in statnet: an R-based environment for statistical analysis and simulation of social networks**

**Martina Morris**

University of Washington

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[morrism@u.washington.edu](mailto:morrism@u.washington.edu)

**Steven M. Goodreau**

University of Washington

**Carter Butts**

UC Irvine

**Mark S. Handcock**

University of Washington

**4** - Wednesday, March 11<sup>th</sup> 8:30am - noon (Students \$30, all others \$50)

This workshop is a tutorial on exponential random graph models for social networks, emphasizing a hands-on approach to fitting these models to empirical data. This workshop will provide a hands-on tutorial to **statnet**, a statistical package for the visualization, analysis and simulation of social network data. The modeling capabilities of **statnet** include the class of exponential random graph (ERG) models. These models recognize the complex dependencies within relational data structures, and provide a very flexible framework for representing them. Examples include degree distributions and stars, attribute-based mixing patterns, triadic patterns that lead to clustering, shared partner distributions, the new specifications in Snijders et. Al. 2006, and other systematic network configurations. **statnet** has a coherent and flexible user interface and can handle relatively large networks (~3,000 is the largest network we have estimated models for), and it has very efficient algorithms for data manipulation and analysis. The package provides tools for both model estimation and model-based network simulation, with visualization, tools for inference and validation, and goodness of fit diagnostics. The package is written for the **R** statistical computing environment, so it runs on any computing platform that supports **R** (Windows, Unix/Linux, Mac), it is freely available through the Comprehensive **R** Archive Network (CRAN), and it has a seamless interface to SNA (an **R** package for traditional network analysis written by Carter Butts).

#### **5. Networks for Newbies**

**Barry Wellman**

University of Toronto, Canada

e-mail: [wellman@chass.utoronto.ca](mailto:wellman@chass.utoronto.ca)

**5** - Wednesday, March 11<sup>th</sup> 8:30am - noon (Students \$30, all others \$50)

This is a non-technical introduction to social network analysis. It describes the development for social network analysis, some key concepts, and some key substantive methods and findings. It is aimed at newcomers to the field, and those who have only seen social network analysis as a method.

## **6. Social Network Approaches for Behavior Change**

### **Tom Valente**

Professor & Director, Master of Public Health Program  
Department of Preventive Medicine  
School of Medicine  
University of Southern California  
e-mail: tvalente@usc.edu

**6** - Wednesday, March 11<sup>th</sup> 8:30am - noon (Students \$30, all others \$50)

This workshop will be conducted in 2 sections. Section 1 will review existing evidence for the utility of using social network data for behavior change in a variety of settings including health behaviors and organizational performance. We present a typology of such efforts. Section 2 will demonstrate existing software programs for implementing social network interventions. The workshop will be conducted by Tom Valente who has developing and implementing network based interventions for over 10 years.

## **7. Using (Excel) .NetMap for Social Network Analysis (Excel)**

### **Marc Smith**

Sociologist, Telligent Research  
e-mail: marc.smith@telligent.com

**7** - Wednesday, March 11<sup>th</sup> 8:30am - noon (Students \$30, all others \$50)

.NetMap is an add-in for Office 2007 that provides social network diagram and analysis tools in the context of a spreadsheet. Adding the directed graph chart type to Excel opens up many possibilities for easily manipulating networks and controlling their display properties. In this tutorial the steps needed to install and operate (Excel) .NetMap are reviewed. The (Excel) .NetMap add-in provides directed graph charting features within Excel, allowing users to create node-link diagrams with control over each node and edge color, size, transparency and shape. Since .NetMap builds within Excel, all of the controls and programmatic features of Office are available. Additional features of (Excel) .NetMap generate social networks from data sources like personal e-mail (drawing data from the Windows Desktop Search engine). Arbitrary edge lists (anything that can be pasted into Excel) can be visualized and analyzed in .NetMap. This session will provide a walk through the basic operation of .NetMap. Attendees are encouraged to bring an edge list of interest. Sample data sets will be provided. To download the Excel .NetMap Add-in and slides, go to the following Web site: <http://www.codeplex.com/netmap>.

## **8. ORA**

### **Terrill Frantz**

Carnegie Mellon University  
e-mail: Terrill L. Frantz terrill@cs.cmu.edu

Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm, Wednesday, March 11<sup>th</sup>, 9:00am - noon (Students \$50, all others \$100)

A lecture and hands-on workshop in which attendees learn about Dynamic Network Analysis (DNA) and the DNA toolkit \*ORA. Foundational concepts and techniques of Dynamic Network Analysis are presented including: assessing meta-network data, geo-spatial enabled network analysis, and change over time. Using \*ORA the attendees will learn how to import, export, visualize, and assess data. Attention will be focused on

spatio-temporal visualization, grouping technologies, and key entity identification. Participants will be presented with a thorough demonstration of software features used to create a sample organization and analyze it using traditional and advanced DNA techniques. Participants will be provided with a cd with an executable of the software, sample data, and a user's guide. Basic social network and dynamic network representations, statistics, analysis and visualization techniques are covered, both in concept and practical operation. This workshop will be fast-paced and involves advanced material, however novices to network analysis should be able to follow along, as the material is presented in an affable, but comprehensive manner.

\*ORA is a powerful network analysis tool, capable of handling large  $10^6$  networks, and supporting meta-network data, geo-spatial network data, and dynamic network data. Relatively unique features include trail and network visualization, fuzzy grouping algorithms, multi-mode network assessment, built in network simulators, and powerful visualizer with data entry and mark-up capabilities. The software presented in this tutorial is Windows operating system based. Versions in vista and linux also exist and Participants with such needs should pre-load the \*ORA software from the CASOS website – <http://www.casos.cs.cmu.edu/projects/ora/>. Participants should bring their own laptops to workshop

## **9. Dynamic Network Analysis (DNA) and AutoMap**

Jana Diesner

Carnegie Mellon University

Email: [diesner@cs.cmu.edu](mailto:diesner@cs.cmu.edu)

Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm, Wednesday, March 11<sup>th</sup>, 9:00am - noon (Students \$50, all others \$100)

**Description:** A lecture and hands-on workshop in which attendees learn about Dynamic Network Analysis (DNA) and the DNA toolkit AutoMap for extracting networks from unstructured texts. The collection and storage of unstructured, natural language text data has become fast, cheap, and easy. Examples for potentially large-scale corpora are answers to open questions in questionnaires, emails, wikis, blogs, chatlogs, news, political debates, mission statements, and annual reports, among others. The challenge is to efficiently and systematically extract network data from these unstructured texts. Such networks might connect diverse entities such as people, organizations, and events and the relations among them. Relational data extracted from texts can help us in answering questions like: Who communicates what with whom? How do trends emerge, spread and vanish in blogs and chats? What groups promote or suppress what ideas, and how successful are they in that?

The workshop attendees acquire methodological expertise in network text analysis as well as hands-on experience in using AutoMap. Participants in this workshop gain experience with text analysis by learning and using AutoMap. They are introduced to several techniques for natural language processing and information extraction that are often applied in this process, such as identification of central topics and terms in single documents or corpora, filtering techniques, stemming (translate words into their

morphemes), Parts of Speech Tagging (assign part of speech to every word), anaphora resolution (translate pronouns into the social entities that the pronoun refers to), Named Entity Extraction (identification of agents, organizations and places that are referred to by a name), and text coding according to user-defined ontologies or taxonomies. The participants are furthermore introduced to the network analysis of email data with AutoMap and the CEMAP sub-tool. We show how relational data extracted from texts can be loaded into \*ORA (a network analysis package) in order to analyze, assess, and visualize the extracted data. Throughout all phases of the workshop we discuss several empirical examples and real-world applications for the techniques covered.

AutoMap is a software package, developed by CASOS, that has been applied by multiple groups and across different domains and languages to extract concepts, semantic networks, and meta-network relational data from texts. AutoMap output is in DyNetML and can be easily assessed using \*ORA. Relatively unique features include user control over windowing, machine learning models for ontological classification, limited anaphora resolution, and bi-gram extraction. The software presented in this tutorial is Windows operating system based. Versions for vista, macs and linux also exist and participants with such needs should pre-load the AutoMap software from the CASOS website – <http://www.casos.cs.cmu.edu/projects/automap/>. Participants should bring their own laptops to workshop.

## **10. Network Genie: Online Social Network Survey Data Collection**

Bill Hansen & Eric Reese

Tanglewood Research Inc

Email: William B. Hansen, [billhansen@tanglewood.net](mailto:billhansen@tanglewood.net)

Eric Reese, [eric@tanglewood.net](mailto:eric@tanglewood.net)

Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm

(Students \$35, all others \$50)

**Description:** Network Genie (<https://secure.networkgenie.com>) is an online application that can be used to: (1) Design complete network, egocentric network and hybrid (snowball) network surveys using a wide variety of survey question formats; (2) Manage social network projects, including manage network lists and project team members who have privileges defined by a project coordinator; (3) Collect social network data using online forms; and (4) Download and export data to the social network analysis program of your choice. Workshop participants will learn to use all of Network Genie's features. Network Genie is a fee-for-service application. Participants will receive a complimentary coupon for 50 surveys valued at \$150 USD.

## **11. Mixed Methods Research Designs for Ego-centered Social Networks**

Betina Hollstein & Laura Bernardi

Universität zu Berlin Institut für Sozialwissenschaften Mikrosoziologie

Email: Betina Hollstein, [betina.hollstein@sowi.hu-berlin.de](mailto:betina.hollstein@sowi.hu-berlin.de)

Laura Bernardi, [Bernardi@demogr.mpg.de](mailto:Bernardi@demogr.mpg.de)

Tuesday, March 10<sup>th</sup>, 9:00am - 5:00pm (Full day)

(Students \$30, all others \$50)

**Description:** This workshop will be conducted in two parts. The first part we introduce social network qualitative research and the principles of mixed methods research designs; we will review data collection and sampling procedures, analytical approaches, and triangulation strategies pointing out advantages and challenges of this approach. Illustrations of the theoretical and methodological aspects are given by bringing a variety of examples from sociological and demographic studies.

The second part is devoted to the presentation of concrete procedure to apply mixed methods in network research both at the level of data collection and analysis. There will be four modules: a) introduction of different graphical instruments to collect network data for ego centered networks and their strong and weak points b) quantitative and qualitative dimensions of network relationships c) the analysis of ego networks in a mixed method perspective (type construction, generalization questions) d) participants will be asked to join in a specific exercise designed to practice social networks in a mixed methods perspective.

## **12. An Introduction to Analytic and Game Theoretic Tools for Network Modeling**

Mathew Jackson, Department of Economics, University of Stanford

Email: Mathew Jackson, [jacksonm@stanford.edu](mailto:jacksonm@stanford.edu)

Tuesday, March 10<sup>th</sup>, 1:00pm - 5:00pm

(Students \$30, all others \$50)

**Description:** In this workshop I will provide an introduction to a set of analytic tools for modeling both network formation and how network structure affects individual behavior. The workshop will begin with an introduction to some basic concepts from game theory and how they can be applied in network contexts. This includes the use of game theoretic equilibrium concepts for modeling network evolution and stability as well as game theoretic techniques for modeling peer effects in network contexts. The workshop will also provide an introduction to other interactive models of learning, contagion, and diffusion, including a look at the SIS model of disease diffusion and an introduction to Markov chains and some of their uses in network modeling. This workshop will draw material from a new graduate text and research reference: "Social and Economic Networks," Princeton University Press 2008. More information on the book is available at <http://www.stanford.edu/~jacksonm/> and the contents and first chapter are available at <http://www.stanford.edu/~jacksonm/netbook.pdf>.

### **13. Collecting Social Network Data**

Alexandra Marin

Department of Sociology, University of Toronto

Email: Alexandra Marin, [alexandra.marin@utoronto.ca](mailto:alexandra.marin@utoronto.ca)

Tuesday, March 10<sup>th</sup>, 8:30am - noon

(Students \$30, all others \$50)

**Description:** This workshop will describe methods of collecting network data, including methods for collecting whole network and ego network data. We will cover a number of methods of collecting network data and the uses and limits of data collected using different methods. In addition, we will discuss defining network boundaries, the reliability of data collected by various methods, factors affecting the data reliability, design of survey or interview instruments, and the problem of respondent burden. This workshop is intended primarily for researchers thinking about collecting their own social network data using survey or interview methods. It may also be of interest to researchers using such data who wish to better understand the strengths and limitations of these data.

### **14. Visualizing and Analyzing Scientific Literature with CiteSpace**

Chaomei Chen, Drexel University, College of Information Science and Technology

Email: Chaomei Chen, [chaomei.chen@cis.drexel.edu](mailto:chaomei.chen@cis.drexel.edu)

Tuesday, March 10<sup>th</sup>, 8:30am - noon

(Students \$30, all others \$50)

**Description:** CiteSpace is a freely available Java application for visualizing and analyzing patterns and trends in scientific literature. This workshop is organized in two parts. The first part will introduce basic concepts and methods for analyzing a variety of networks derived and extracted from scientific literature, including scientific collaboration networks of individuals, institutions, and countries, author co-citation networks, document co-citation networks, and other networks extracted from scientific publications. Step-by-step walkthroughs of the system will be given during the workshop. Participants are encouraged to bring their own laptops to take part in the series of analysis. The second part will introduce advanced features and focus on making sense of visualized results and interpreting findings. In-depth case studies will be presented through interactive sessions. Participants are encouraged to bring their own datasets in the ISI Export Format for a hands-on session. The workshop will conclude with an outline of additional applications and studies. For further information on CiteSpace, visit: <http://cluster.cis.drexel.edu/~cchen/citespace>

## **15. Social Network Analysis in Business**

Valdis Krebs, College of Information Science and Technology

Email: Valdis Krebs, [valdis@orgnet.com](mailto:valdis@orgnet.com)

Wednesday, March 11<sup>th</sup>, 8:30am - noon

(Students \$30, all others \$50)

**Description:** Aimed at internal/external consultants who want to add SNA/ONA to their tool kit -- also useful for students/professors who want to do some consulting on the side. We will go through the SNA/ONA process and also investigate some SNA data from real business organizations. Valdis will share stories and experiences based on the hundreds of projects he has been involved in. The focus will be "making SNA/ONA useful & practical for business leaders". Attendees will get the student version of InFlow [limited to 75 nodes/project].