Social Network Analysis

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Cologne Graduate School in Management, Economics and Social Sciences
Course: Number 1623
Location: Max-Planck-Institut für Gesellschaftsforschung, Paulstr. 3, 50676 Köln
Time: Mondays 14:00 - 15:30
Credit Points: 6
Type of Course: Fachübergreifende Theorien und Methoden
Course Language: English

The Seminar introduces into central topics of Social Networks, the formal representation of networks as mathematical graphs and the computational analysis and visualization. We use Pajek, a free program for the analysis of large networks. The course introduces into elementary networks metrics, centrality measures, concepts of dense areas like cliques and cores and structural equivalence (block modeling). Special topics are ego-networks and the analysis of two mode networks, concepts of network growth, diffusion processes in networks.

Requirements:
Oral presentation of one course text in the seminar
and own network project or oral exam.

Reading:

October 11  INTRODUCTION, OVERVIEW
actors, attributes, relations: symmetric; asymmetric, (di)- graphs
Scott: Chapters 1-2
Pajek Chapter 1: Looking for Social Structure

- Videolecture: On Social Networks with an overview of graph drawing with
demo of a system Pajek http://videolectures.net/cov05_batagelj_snogd/


October 18  BASIC NETWORK METRICS
density, degrees, paths, cycles, closeness, betweeness
Scott: Chapter 3-4
Pajek Chapter 2: Attributes and Relations


October 25  CLIQUES AND COMMUNITIES
cliques, cores, . . . , k-plexes, clusters, communities
Scott: Chapter 5-6
Pajek Chapter 3: Cohesive Subgroups


November 15  POSITIONS AND ROLES
Positions, Roles, Clusters, Blockmodelling, Structural Equivalence
Scott: Chapter 7
Pajek Chapter 12: Block Models


November 22  SOCIAL CAPITAL, STRUCTURAL HOLES


November 29  EGO NETWORKS


December 6 Asymmetries, Hierarchies, Power,


December 13 Growth of Personal Networks

Homophily, clustering, triads, transitivity

Pajek: Chapter 4: Sentiments and Friendship


December 20 Affiliation Networks: Two- and N-mode Graphs


January 10 Network Dynamics: Diffusion in Networks
Pajek Chapter 8: diffusion


January 17 NETWORK VISUALIZATION

mapping, layouts, attributes,


January 24 NETWORK DYNAMICS: GROWTH AND DECAY


January 31 VIRTUAL COMMUNITIES


General Literature


Free Programs

**Pajek**  Vlado Batagelj and Andrej Mrvar: a powerful free program especially designed to analyze very large networks.
http://pajek.imfm.si/doku.php?id=download


**Visone** is a free graph drawing program maintained by Ulrik Brandes to analyze and visualize social network data.
http://www.visone.info

**NetDraw** is a free Network Drawing Program which is available from Analytic Tech
http://www.analytictech.com

**NodeXL** a free program by Marc Smith which runs in Microsoft Excell 2007 as template with interactive features
http://www.codeplex.com/nodexl
Hansen, Derek , Ben Shneiderman, Marc Smith (2009) Analyzing Social Media Networks: Learning by Doing with NodeXL.

**Gephi** Gephi is an interactive visualization and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs.
http://gephi.org/

FREE TECHNICAL INTRODUCTIONS:

- Michael Schnegg und Hartmut Lang (2001): Netzwerkanalyse
  http://www.methoden-der-ethnographie.de/heft1/heft1.html

  http://faculty.ucr.edu/~hanneman/SOC157/NETTEXT.PDF