

LIST OF ALL WORKSHOPS

Half-day workshops (3 hours)	2
Visualization of social networks with NODEXL	2
Exponential Family Random Graph Modeling (ERGMS) Using statnet.....	3
Introduction to Modeling Temporal (Dynamic) ERGMs Using statnet	4
The Positional Approach to Social Network Analysis	5
Relational Events: Estimating Dynamic Network Actor (DyNAM) Models with the Goldfish Software.....	6
Visualizing Social Networks. How to Create Meaningful and Compelling Network Drawings.	7
Real-Time Twitter Mining and Network Analysis of Hashtags and Mentions with Apache Spark.....	8
Topic Modeling and Topic Networks with Python	9
Advanced RSiena users' workshop	10
Full-day workshops (6 hours)	11
Simplifying ego-centered network analysis in R with egonetR	11
Introduction to Social Network Analysis and UCINET: Application and Theory.....	12
Networks in Python: Introducing the NetworkX-package.....	13
Introduction to NetLogo and agent-based models of networks	14
Social Network Analysis for the Analysis of Multiple Groups.....	15
Analysing network dynamics and peer influence processes with RSiena	17
Introduction to Qualitative Structural Analysis (QSA)	19
Using R and igraph for Social Network Analysis	20

Half-day workshops (3 hours)

Visualization of social networks with NODEXL

Verena Texier-Ast (*Universität Münster*)

Over the past two decades, the term 'social networks' has become a central way for describing the social contacts that a person or organisation, company, institution and so on (ego) has with another (alteri). Making their underlying social relations visible contributes to a better and deeper understanding of their network structure. It becomes tangible.

Besides commercial or partially commercial programs such as e.g. UCINET, NodeXL, a free Excel-Plug-In-Software can be seen as a useful alternative in this respect. It is easy to adopt for existing users of Excel, as it has just one further tab in the header within Excel and lends itself easily to 'learning by doing'.

Aim of this three-hour workshop is to introduce the participants of the workshop to the mentioned freeware NodeXL. Particular attention will be paid to the individual application of the software in one owns research.

Course of the workshop:

- Introduction to the software NodeXL
- Discussion of the data to be visualized
- Supporting individual visualization of social networks with NodeXL
- Presentation of the social networks visualized by the participants
- Final evaluation of the software NodeXL (advantages/ disadvantages)

Requirements for participants:

- Participants must bring their own laptop with them to the course (Excel 2007 or higher must be installed)
- Good knowledge in the work with Excel
- Interest in the topic of visualization of social networks
- Download and installation of the software NodeXL (<https://nodexl.codeplex.com/>)
- Provision of a data set for visualization

Exponential Family Random Graph Modeling (ERGMs) Using statnet

Lorien Jasny (University of Exeter)

This workshop will provide an introductory tutorial on using exponential-family random graph models (ERGMs) for statistical modeling of social networks, using a hands-on approach to fitting these models to data. The ERGM framework allows for the specification, estimation, and simulation of models that incorporate the complex dependencies within networks, and provides a general and flexible means of representing them. The session will demonstrate ERG modeling using the statnet software in R.

Topics covered within this session include: an overview of the ERGM framework; defining and fitting models to empirical data; interpretation of model coefficients; goodness-of-fit and model adequacy checking; simulation of networks using ERG models; degeneracy assessment and avoidance; and modeling and simulation of complete networks from egocentrically sampled data. Familiarity with basic descriptive network concepts and statistical methods for network analysis within the R/statnet platform is recommended. Attendees are expected to have had some prior exposure to R, but extensive experience is not assumed. statnet is a collection of integrated packages for the R statistical computing environment that support the representation, manipulation, visualization, modeling, simulation, and analysis of network data. statnet is developed and maintained by a team of volunteer developers, and is released under the GNU Public License. statnet packages can be used with any computing platform that supports R (including Windows, Linux, and Mac). The software supports statistical analysis of large networks, temporal network analysis and valued ties, with utilities for missing and sampled data.

Introduction to Modeling Temporal (Dynamic) ERGMs Using statnet

Lorien Jasny (University of Exeter)

This workshop will provide an introduction to the estimation and simulation of dynamic networks using Temporal Exponential-Family Random Graph Models (TERGMs) in statnet. We will cover the statistical theory and methods for separable temporal ERG modeling, with a hands-on tutorial using the TERGM software package. TERGM can be used for both estimation from and simulation of dynamic network data, and it provides a wide range of fitting diagnostics. The topics covered will include estimation from network panel data, from a single cross-sectional network with link duration information, and from cross-sectional, egocentrically sampled network data. Simulating dynamic networks with both fixed and changing node sets will also be covered. We will demonstrate how the results of a dynamic network simulation can be visualized as an animated "network movie" using the ndTV package in statnet. An example of the type of "network movie" these tools can produce can be found at statnet.org/movies. This workshop will assume familiarity with R, and the network, SNA and ergm packages in statnet.

The "Exponential Family Random Graph Modeling (ERGMs) with statnet" workshop is recommended as preparation. statnet is a collection of integrated packages for the R statistical computing environment that support the representation, manipulation, visualization, modeling, simulation, and analysis of network data. statnet is developed and maintained by a team of volunteer developers, and is released under the GNU Public License. statnet packages can be used with any computing platform that supports R (including Windows, Linux, and Mac). The software supports statistical analysis of large networks, temporal network analysis and valued ties, with utilities for missing and sampled data.

The Positional Approach to Social Network Analysis

Ulrik Brandes (University of Konstanz), David Schoch (University of Konstanz)

The positional approach is a recent methodological innovation intended to narrow the gap between substantive theory and mathematical analysis of social networks. By breaking down current methods into meaningful and manageable decision steps it explicates hitherto tacit assumptions, suggests means to overcome them, and smoothly generalizes approaches to valued, multiplex, multilevel, and temporal data. It also facilitates the incorporation of more qualitative observations to yield more nuanced results.

This is achieved with the help of a simple conceptual change, namely the explicit definition of the position of an actor as the aggregate of direct and indirect relationships and attributes. Starting from this key concept, the network position, state-of-the-art methods of analysis turn out to be special cases of positional comparisons and evaluation. The characterization of actors by their positions can be thought of as a form of conjoint measurement, and exploits a richer array of non-quantitative mathematical tools.

Methodologically, this allows to separate the substantive argumentation of what defines a position from the formal analysis of the network it is embedded in. An important benefit of the genericity of the positional approach is that it unifies existing methods and at the same time suggests many new methods via alternative instantiations of their elements. Moreover, it facilitates basic research by identifying relevant problems without requiring domain-specific background knowledge.

The workshop is an introduction to the positional approach starting from first principles. It is centered around use cases that cover a broad range of social network application domains. We will discuss the relative utility of positional and current state-of-the-art approaches and identify how method selection can be better informed by substantive theory. If desired, participants can submit example data or research designs to be discussed in the workshop.

Skills required by the participant: Basic understanding of network analytic concepts such as centrality, roles, and communities.

Equipment needed by the participants: A laptop with visone installed (www.visone.info) and possibly R with package Rserve (from cran.r-project.org) are useful, though.

Relational Events: Estimating Dynamic Network Actor (DyNAM) Models with the Goldfish Software

Christoph Stadtfeld (ETH Zürich), James Hollway (Graduate Institute, Geneva)

Required skills: Basic understanding of R Basic understanding of SIENA or other statistical network models is helpful

Equipment: A projector, wifi access and power sockets for all participants

Course material: Will be published at www.social-networks.ethz.ch

The advent of electronic communication, social media, and human sensor technologies have brought about a wealth of fine-grained social interaction data that are often easily accessible to social scientists. Archival network data sources also often come with detailed information about duration and order of relational ties. This workshop introduces and compares different approaches for the analysis of time-stamped network data. The goal is to provide an overview of research problems that relate to time-stamped network data, to enable participants to conduct basic analyses with the Goldfish package, and to introduce conceptual and practical differences between models that have been proposed, in particular, focusing on differences between actor-oriented and tie-oriented approaches.

The practical elements of the workshop (about 50%) introduce Goldfish, a new R package for the analysis of time-stamped network data. In particular, three types of models are introduced, compared, and practically applied.

1. Actor-oriented models for undirected coordination ties. Typical examples are research problems found in the political sciences (e.g., the creation and dissolution of international treaties) and economics (e.g., coordination between financial institutions) and are concerned with the creation of undirected, bilateral agreements that are the result of a coordination process.
2. Actor-oriented models for directed events. Typical examples are sequences of interaction events (e.g., phone calls) or directed transactions (e.g., financial transactions).
3. Both actor-oriented models are compared to the tie-oriented relational event model which can also be estimated with the Goldfish package.

The practical elements make use of R scripts that are distributed to participants in advance. Participants can further bring their own research problems and their own data. Based on the number of participants, a limited amount of time will be reserved to discuss these.

References:

Butts, C. T. A relational event framework for social action *Sociological Methodology*, 2008, 38, 155-200

Stadtfeld, C. *Events in Social Networks. A Stochastic Actor-oriented Framework for Dynamic Event Processes in Social Networks* KIT Scientific Publishing, 2012

Stadtfeld, C.; Hollway, J. & Block, P. *Dynamic Network Actor Models: Investigating Coordination Ties through Time*, *Sociological Methodology*, 2017

Visualizing Social Networks. How to Create Meaningful and Compelling Network Drawings.

Jürgen Pfeffer (Technical University of Munich)

The ability to visualize social structures is one of the most obvious advantages of social network analysis. With network drawings, you are able to visualize analytical research results in a communicative way. Presenting outcomes is a common application of network visualizations, however they are not only for use at the end of a research project; they can also yield first impressions of data in a very early stage of this process. The precondition for effective information visualization and successful visual reasoning is the capability to draw “good” pictures. Although drawing networks is more complex than clicking the “Draw” button of a social network analysis tool, a basic knowledge of certain rules can increase the quality of your visualizations dramatically. These techniques, explored in this workshop, make visualizing networks into a craft rather than an art.

In this workshop, you will learn about different aspects of visualizing networks and about underlying visualization principles, giving you the ability to assess the quality of network visualizations and to draw better network pictures by yourself. This workshop is neither an introduction into a specific network analysis tool nor will we discuss technical details about layout algorithms or the like. Instead, this half a day (3 hours) session will cover the following topics:

- Fundamentals of information visualization
- Visual elements for drawing networks
- Multivariate information visualization with networks
- Communicating with colors
- Human perception

Participants are invited to bring their own network data in order to create meaningful and compelling network drawings for their publications and presentations.

Real-Time Twitter Mining and Network Analysis of Hashtags and Mentions with Apache Spark

Moses Boudourides (University of Patras, Greece), Sergios Lenis (University of Patras, Greece)

The purpose of this workshop is to bring people from zero knowledge to knowing how to do Twitter mining through the Streaming API and how to proceed in analyzing the collected dataset. In particular, the following analyses are going to be discussed:

1. Time-series of counts (frequencies) of tweets, Twitter users, languages, embedded media, hashtags, mentions etc.
2. Mapping the geolocations from where those tweets having explicit locations were sent.
3. Sentiment analysis of the content of the tweets,
4. Network analyses of two kinds of networks extracted from these tweets: networks of co-occurring hashtags and networks among Twitter users who are mentioning (including RTing and replying to) other Twitter users.

These tasks will be implemented by working with PySpark (run on Apache Zeppelin Notebook). Moreover, the obtained network results are integrated into javascript (d3) network visualizations.

Required skills: Elementary familiarity with Python

Equipment: Laptops with Python 2.7, Jupyter Notebook, PySpark and Zeppelin Notebook.

Further technical assistance will be given to prospective workshop participants during the month before the workshop.

Topic Modeling and Topic Networks with Python

Moses Boudourides (University of Patras, Greece), Sergios Lenis (University of Patras, Greece)

The aim of this workshop is to apply the NLP technique of topic modeling in the dataset of all abstracts of contributed papers presented at the Sunbelt conferences from 2001 to 2016. As it is known, through topic modeling one may discover hidden themes appearing in the text body of the presentations. In our case, as each document consists of all the abstracts of the social-networks-related papers contributed in an annual conference, one would expect words from the basic terminology of social network analysis to appear at various parts of the document in different proportions in such a way that words belonging to a similar semantic context would cluster together inside specific “topics” of the theory of social networks.

Using the Latent Dirichlet Allocation (LDA) model, one may propound and explain why each document is a mixture of a small number of topics, around which the contents (abstracts) of the document unfold. Moreover, it is interesting to observe the dynamics of topics attributions during different time periods and to analyze how topics are constituting certain networks through co-occurrences of their constituent words in the documents of the Sunbelt abstracts dataset.

In this workshop, we are going to be working with two computational platforms, GraphLab Create (as part of the Turi machine learning platform) and PySpark (run on Apache Zeppelin Notebook). Notice that although both platforms are based on Python, they are employing two different realizations of dataframes (SFrames and Spark Dataframes).

Workshop duration: 3 hrs.

Required skills: Elementary familiarity with Python

Equipment: Laptops with Python 2.7, Jupyter Notebook, Zeppelin Notebook, NLTK and GraphLabCreate’s SF.

Further technical assistance will be given to prospective workshop participants during the month before the workshop.

Advanced RSiena users' workshop

Tom A.B. Snijders (University of Groningen; University of Oxford), Christian E.G. Steglich (Linköping University, University of Groningen)

This workshop is intended for experienced users of RSiena, the package in the statistical software system R for analyzing longitudinal data of networks, and of networks and behavior.

A number of new features of RSiena, and some possibilities that may be considered advanced options, will be discussed and demonstrated.

Some of the following topics may receive attention:

- Goodness of fit checking with `sienaGOF()`.
- How to deal with missing data.
- Parameter interpretation; selection and influence tables.
- Multilevel analysis of network dynamics with `sienaBayes()`.
- Dynamics of two-mode networks.
- Dynamics of multiple (multivariate) networks.
- Dynamics of networks with ordered categorical tie values.
- Event history / diffusion of innovations with an endogenously changing network.
- The Settings model for dynamics of larger networks.
- Analyzing network and behavior for continuous behavior variables.
- Other recent developments – if any; e.g., newly implemented effects.

The choice between these topics will be made dependent also on interests of the participants.

Participants are invited to email the organizer (tom.snijders "at" nuffield.ox.ac.uk) in the period September 1-10 to indicate differential preferences for these (or other!) topics, since it will be impossible to treat all of them in depth.

Participants are requested to check the SIENA website (Courses-activities tab) in the week before the workshop to download the workshop materials. Participants might consider bringing their own laptop with R and RSiena installed, and these materials downloaded, such that some steps of the data analysis can be followed hands-on.

Prerequisites: experience with using RSiena

Maximum number of participants: 30

SIENA website: <http://www.stats.ox.ac.uk/~snijders/siena>

Full-day Workshops (6 hours)

Simplifying ego-centered network analysis in R with egonetR

Till Krenz (Otto-von-Guericke University Magdeburg)

Ego-centered network analysis is tricky because most often you have n +many networks which you want to analyse simultaneously and performing multivariate analyses, where network data and attributional data of ego are combined. An ego-centered network is commonly known as the network of a focal actor (ego), including the relationships of ego to alters and the relationships between these alters. Analysis can be conducted on two different levels: On the *alter* level the analysis focusses on the qualities of the ego-alter-relationships e.g. provision of support or contact frequency. The *network* level analysis focuses the structure and composition of the ego-centered network. The most reasonable way to analyse multiple ego-centered networks is to use R because it allows both the calculation of various network measures for n +many networks simultaneously (e.g. what is the density of all networks) and multivariate analysis of network and attributional data (e.g. how does density vary between men and women). The workshop focuses the *analysis* of ego-centered networks using data from current research projects. We introduce the R-package “egonetR” which simplifies the import and manipulation of ego, alter and network-level data in different formats and allows to calculate a range of network measures. Using “egonetR” users will be enabled to conduct ego-centered network analysis with very basic R programming knowledge.

After a short introduction into data management and data import to R we calculate network measures on alter level (e.g. multiplexity, homophily) and network level (size, density, EI-Index, diversity, components, proportions of ties with specific attributes). Afterwards we go on with multivariate analyses, both on alter and the network level. For both levels we exemplify explorative and hypothesis testing procedures using additional packages in R (e.g. cluster, lme4, FactoMineR): On the network level we focus cluster analysis and standard regression. With cluster analysis we present a way to typologize ego-networks along network-level information. In standard regression analysis, network measures can be used as dependent or independent variables, just as any other characteristic of ego e.g. to test whether network size differs by gender or age. On the level of the analysis of ego-alter dyads we demonstrate multivariate correspondance analysis and give a short introduction to multilevel analysis. Multivariate correspondance analysis is used to explore the dependencies between categorial alter-level variables using visualisations. Multilevel analysis is used to treat with the nested nature of alter level data when dependent variables lies on the alter level.

Major parts of the workshop will be “hands-on” utilizing R (R-Studio). A short intro into the basics of R will be given in the beginning, while prior knowledge in R is preferable.

Further information will be available on (<http://rego.tillt.net>).

Technology Needs: Laptops with internet access. Installation of R (<http://cran.r-project.org/>) and R- Studio (www.rstudio.com) before the workshop is required.

Introduction to Social Network Analysis and UCINET: Application and Theory

Sakin Erin (University of California-Riverside)

This is a 6-hour introduction to social network analysis which will focus on both theory and the application of social network analysis. The theory aspect covers the dynamics of an interaction between individuals and social structures. Examining this dynamic from a sociological perspective, it shows how social actors affect social structures while at the same they are influenced by them. It particularly analyzes an individual's position in social structure and the consequences of occupying certain positions in the structure such as behavior restrictions or opportunities for resources.

The application part covers basic methods of collecting social network data, managing data, and running some of the most essential network procedures using UCINET. These procedures include but not limited to basic measures of centrality concepts, structural equivalence, structural holes, change in egocentric networks and network visualization.

This workshop does not require any prior knowledge of social network analysis or UCINET software. It is also open to participants from any social science discipline.

Prerequisites: No prerequisites.

Networks in Python: Introducing the NetworkX-package

Raphael Heiberger (University of Bremen), Jan Riebling (University of Bamberg)

The rising prominence of social network analysis has been mirrored in the development of specialized tools and computer programs for various kinds of network data. This general trend has been enhanced by the current data revolution. New kinds of network data such as process generated data from social network sites and networks extracted through the use of text- and data mining techniques become increasingly available. Yet these new data sources do seldom come in format which is compatible with standard SNA software packages. Instead a tool is needed, which does not only provide the standard algorithms for the analysis social networks and can handle large datasets efficiently, but at the same time provides access to a wide variety of data types and the flexibility to construct network data from these (e.g. documents, websites, etc.).

The open-source programming language Python seems very well equipped to take on these challenges. It provides a robust framework which is not only relatively fast but also flexible, since it can be extended by packages which give access to a wide range of functions for specialized tasks. For social network analysis the NetworkX-package supplies a Python user with fast algorithms for the analysis, an easy to access data structure for the construction and transformation of networks as well as graphical tools for the visualization. In our workshop we will focus especially on Python's flexibility, which gives researchers the ability to follow their own research interests in terms of data as well as concerning the implementation of their own methodologies. The workshop tries to accomplish this through two different stages (i.e. sessions).

First, we introduce Python in general, its syntax and the "pythonic way" of solving your computational problems. This includes the import and export of different data files and formats, the use of loops as a powerful mean to repeat similar tasks very efficiently, as well as the transformation of large raw data sets into network compatible formats. This part is held by Jan Riebling.

Secondly, we extend this basic techniques and introduce the workshop participants to the NetworkX-package. This part will also cover the management of network data, but focus the utilization of various measures. Additionally, there exist many build-in algorithms for community detection and network evolution that can be easily applied after the first step. Finally, we discuss some visualization tools for presenting your results. This second part is held by Raphael Heiberger.

Introduction to NetLogo and agent-based models of networks

Paola Tubaro (Laboratoire de Recherche en Informatique (LRI) France), Yasaman Sarabi (Centre for Business Network Analysis (CBNA) - University of Greenwich)

There is a growing interest in economics and social science for agent-based models, a computer simulation technique which represents socio-economic processes as open-ended dynamic systems of interacting agents. These models can support both theory-building and empirical analyses, and are especially well-suited to study complex and multi-faceted phenomena that standard social science methods struggle to comprehend, from financial crises to traffic congestion, the rise of extremisms, and urban riots. In particular, the dynamics of social network effects can be explored in depth with agent-based models.

This workshop aims to introduce the potential of agent-based models, for the social sciences in general and for social network analysis in particular. It provides participants with basic knowledge of the simulation methodology and insight into the design and analysis of computer experiments. NetLogo, the software that is introduced in this workshop, is a widely used package that provides tools to build models; run experiments; produce, store and analyze simulated data. Participants will have the opportunity to explore NetLogo's functionalities by working on different versions of a model. They will gain hands-on experience on how to modify existing models in the NetLogo library, and will understand the basic steps towards writing their own model from scratch.

Participants are not assumed to have any preliminary knowledge of computer simulation or agent-based models.

Participants are advised to bring their own laptops, on which they will have downloaded the NetLogo package and the User's manual. Both are available freely from <https://ccl.northwestern.edu/netlogo/>

Social Network Analysis for the Analysis of Multiple Groups

Filip Agneessens (University of Surrey)

Standard social network analysis methods often focus on answering questions about a single network. In other words, they focus on a single set of nodes to answer questions about whether specific properties (reciprocity, transitivity, cyclicity, homophily) are more or less present compared to chance, or to answer questions about the relative centrality (network position) of nodes in a network.

However, in some cases we might be interested in analysing and comparing the networks of multiple groups (e.g. multiple teams or multiple classrooms) at the same time. We might be interested in very different types of questions in this case. For example:

- We might be interested in finding the patterns that are similar over these networks, for example by using an ERGM or SIENA model. For example, combining these different networks, overall do we find reciprocity, clustering, homophily, etc. in these networks?
- We might be interested to see if different patterns exist for different types of networks. Is homophily more important in groups that have a diverse set of actors?
- We might focus on the differences in structures among these networks (e.g. centralisation or density) and try to explain why these differences emerge or how these differences in structure impact outcomes such as group performance. For example, does diversity in a team lead to specific informal trust structure among its members? Or does the trust structure among its members subsequently impacts the performance of the team?
- We might be interested in the position of a person in the network and see if these positions have a different effect depending on the network structure or group composition. Do central actors have higher benefits when these are in decentralised or dense networks?
- We might be interested in whether nodes with specific characteristics (e.g. high extraversion) become more central in the network if they are in a group where other people are low on extraversion, than in a group with other high extravert people?
- We might even be interested in the links between groups. Do more dense networks have less contacts outside?

In this course, we will provide an overview of how social network data can be used to answer such questions using multiple groups (whether teams, classrooms or other networks). We will deal with both theory (e.g., Burt's structural holes) and analytical tools (using R) to study social network data. We will pay attention to the dyadic, individual and team level. At the dyadic level we could consider reciprocity, clustering and homophily. At the individual level, we will focus on the individual position of a member in a team (such as degree, closeness, betweenness, brokerage and diversity). At the team level we could focus on the network structure (such as density, centralization, fragmentation and hierarchy). We will consider both research that explains the emergence of such network relations, and research that considers the consequences of such network relations on outcomes at each of these levels (such as individual job satisfaction or group performance). We will also discuss potential cross-level interactions. We will focus a large part of the course on developing the correct levels of analysis. For the analysis, we will primarily use packages available in R to calculate these measures. Because of its flexibility, R is especially suitable for handling social network data that consists of (many) multiple teams.

No prior computer programming experience is necessary. However please ensure that you have a recent version of R installed on your computer (<https://cran.r-project.org/>). Basic knowledge of social network concepts (such as centrality and density) is recommended.

Maximum number of participants: 30

Skills required by the participant: None, although basic knowledge of social network concepts (such as centrality and density) is recommended.

Equipment needed by the participants: Laptop with R (Rstudio)

Analysing network dynamics and peer influence processes with RSiena

Christian Steglich (Linköping University, University of Groningen), Tom A.B. Snijders (University of Groningen, University of Oxford)

This workshop gives an introduction to the statistical modelling of longitudinal social network data. Starting with general considerations about purpose and quality criteria for such models, we then focus on the model family of stochastic actor-based models, implemented in the RSiena program (Ripley et al., 2016). 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 consists of two parts, each of which consists of a lecture combined with hands-on exercises using the RSiena package, part of the R statistical programming environment.

Part 1: Network Dynamics

Stochastic actor-based models for network evolution (Snijders, van de Bunt & Steglich, 2010) allow analysing global network change as emerging from local decisions, taken by the actors in response to their personal network environment. In this part of the workshop, participants are introduced to these models and learn how to apply them in the analysis of longitudinal, sociocentric network data. Estimation quality and goodness of fit will be addressed, as well as ways how to improve both.

Part 2: Peer Influence Processes

In the second part of the workshop, the central topic is the analysis of network influence processes, like contagion or diffusion, taking place in dynamically changing, sociocentric networks (Steglich, Snijders & Pearson, 2010). In the lecture, course participants are introduced to the problems related to the identification of network influence, and to the stochastic actor-based approach for addressing these. In the lab exercises, they familiarise themselves with the use of the RSiena software for estimating these models.

Prerequisites:

Course participants should have a basic understanding of model-based statistical inference (say, logistic regression), some prior knowledge of social networks, and should have had some basic exposure to the R statistical software environment. They are expected to bring their own laptop to the course (Windows, Mac or Linux), with the R statistical software environment and the RSiena package pre-installed. Participants for whom R is new are requested to learn the basics of R before the workshop: how to run R and how to give basic R commands. This is to reduce the amount of new material to digest at the workshop itself. The Siena website (RSiena tab) has some links which can be helpful for this purpose: it's not hard! Further instructions will be given before the conference starts. Please consult the SIENA website (tab "courses / activities") in the week before the workshop to download the course material.

Literature:

Ripley, R., T.A.B. Snijders, Zsofia Boda, András Vörös, and P.Preciado (2016). Manual for RSiena. URL: http://r-forge.r-project.org/R/?group_id=461

Snijders, Tom, Gerhard van de Bunt, and Christian Steglich, 2010. Introduction to stochastic actor-based models for network dynamics. *Social Networks* 32, 44-60.

Steglich, Christian, Tom A.B.Snijders, and Mike Pearson, 2010. Dynamic Networks and Behavior: Separating Selection from Influence. *Sociological Methodology* 40, 329-393.

SIENA website: <http://www.stats.ox.ac.uk/~snijders/siena>

Introduction to Qualitative Structural Analysis (QSA)

Andreas Herz (University of Marburg), Luisa Peters (University of Hildesheim), Inga Truschkat (University of Hildesheim)

Qualitative Structural Analysis (QSA) is an approach for analyzing qualitative network data (e.g. network maps and narrative data from interviews). QSA is based on procedures from qualitative research (sequential analysis, sensitizing concepts, memo writing) and integrates these procedures with concepts from formal network analysis. QSA is thus a combination of the analytical perspective of structural analysis and analytical standards taken from qualitative social research.

In the workshop participants will get an insight in the theoretical and methodical basis as well as basic principles of QSA. Here we introduce both basic premises of qualitative social research and of social network analysis and how they can be accomplished and integrated via QSA. We explore the process of analysis via QSA and introduce hands-on methods for the qualitative analysis of network data. Amongst others, we discuss how QSA allows to sequence and interpret qualitative data material via structure-, relation- and actor-focused questions and how concepts from SNA can be used as sensitizing concepts to guide the analysis. Strategies to integrate material from different sources in the analysis (e.g. qualitative interview and network map) are also discussed.

The format of the workshop encompasses presentations to introduce the basics, small group sessions to practice hands-on analysis strategies and open question slots.

Note: Participants get the opportunity to bring own qualitative network data from own empirical projects to be analysed in small group analysis sessions (network map, transcript of interview part, etc) and – depending on the number of workshop participants – the possibility to discuss questions in own qualitative network projects. Please contact Andreas Herz (herzand@uni-hildesheim.de) before the workshop to organize who brings qualitative material to the sessions.

Recommended Reading prior to the workshop:

Herz, A., Peters, L. & Truschkat, I. (2015). How to do Qualitative Structural Analysis: The Qualitative Interpretation of Network Maps and Narrative Interviews. *Forum Qualitative Sozialforschung / Forum: Qualitative Social Research* [52 paragraphs], 16(1). Online available: <http://nbn-resolving.de/urn:nbn:de:0114-fqs150190>

Skills prior to the workshop: none

Technology needs of participants: none

Using R and igraph for Social Network Analysis

Michał Bojanowski (University of Warsaw)

The workshop introduces R and package igraph for social network data manipulation, visualization, and analysis.

The material will cover:

- Brief introduction to R.
- Creating and manipulating network data objects
- Working with node and tie attributes
- Creating network visualizations
- A tour through computing selected SNA methods including: degree distribution, centrality measures, shortest paths, connected components, quantifying homophily / segregation, network community detection.
- Connections to other R packages for SNA, e.g.: statnet, RSiena, egonetR

The focus is on analysis of complete network data and providing prerequisites for other workshops regularly available on Sunbelt and EUSN conferences including two on ego-network analysis: "Introduction to ego-network analysis" by Raffaele Vacca and "Simplifying advanced ego-network analysis in R with egonetR" by Till Krenz and Andreas Herz.

The workshop have been successfully organized on earlier Sunbelt conferences (since Sunbelt 2011) and on European Social Networks conference (since EUSN 2014). The workshop attracted a lot of attention (total of over 160 participants since 2011) and positive feedback (80% report being satisfied, 75% would recommend the workshop to a colleague). The earlier workshop title was "Introduction to Social Network Analysis with R". The content have been updated to catch up with newest developments in igraph and related packages.

Target audience and requirements:

The workshop is designed to be accessible for people who have limited experience with R. The participants are expected to be familiar with basic R objects (e.g. matrices and data frames) and functions (e.g. reading data, computing basic statistics, basic visualization). Some *very brief* generic introduction to R will be provided.

To be absolutely on the safe side we recommend taking an internet course on the level of R programming course on Coursera (<https://www.coursera.org/course/rprog>), which you can take every month, or skimming through a book on the level of initial eight sections of Roger D. Peng book "R programming" (<https://leanpub.com/rprogramming>).

Participants are encouraged to bring own laptops. We have prepared examples and exercises to be completed during the workshop. Detailed instructions how to prepare will be distributed in due time.