



7th European Conference on **Social Networks**



M3.1 AND M3.2 | REM beyond dyads: relational hyperevent modeling with eventnet (beginners and advanced)

Juergen Lerner (University of Konstanz)

Alessandro Lomi (Università della Svizzera italiana)

Networks of social relations and communication networks frequently generate information on repeated interaction over time. In this workshop we will specifically discuss "polyadic" social interaction processes in which events can connect varying and potentially large numbers of actors simultaneously. Examples of such polyadic events (or "hyperevents") include sequences of meeting events or social gatherings, connecting all of their participants simultaneously, or multicast (i.e., "one-to-many") communication events such as emails in which one actor sends the same message to several receivers.

The first part of this workshop ("beginners") provides a hands-on introduction to relational hyperevent models (RHEM) illustrated by a practical analysis of the famous Davis, Gardner, and Gardner "Deep South / Southern Women" data with the open-source software eventnet (<https://github.com/juergenlerner/eventnet>).

The second part of this workshop ("advanced") discusses several variations of the basic model. RHEM can be applied in various application settings, each coming with possibly different structural constraints, network effects, challenges, and opportunities. The application scenarios that we discuss include the analysis of multicast communication networks (Enron email data) and the coevolution of scientific collaboration and citation networks.

The workshop is targeted at participants interested in statistical modeling of networks based on relational event data - with a specific focus on polyadic, multicast, or one-to-many interaction events. Participation in the first part ("beginners") does not assume any particular prior knowledge. Participation in the second part ("advanced") assumes participation in the first part or, alternatively, basic knowledge about statistical models for networks, such as REM, ERGM, SAOM/Siena, or similar models. It is possible to attend both parts or only one of the two parts, depending on interest and prior knowledge.

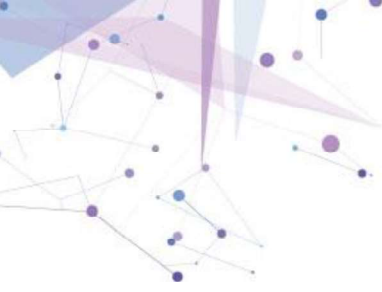
M3.3 | Introduction to UCINET

Srinidhi Vasudevan (University of Greenwich)

Anna Piazza (University of Greenwich)

This introductory workshop outlines the theoretical concepts of social network analysis and operationalisation of network measures through the use of the software Ucinet/Netdraw. The workshop covers the theoretical and empirical overview of the social network research field with an emphasis on the main concept of social network analysis, such as centrality, cohesion and social capital; and aspects of data collection and management for visualising and analysing networks through the Software. The workshop will provide examples of applications of networks in various fields including education, management, health and bibliometric research and we will try to other examples that are relevant to the participants.

Ucinet/Netdraw can be downloaded from <https://sites.google.com/site/ucinetsoftware/home> and participants are strongly encouraged to download it prior to the workshop.



7th European Conference on **Social Networks**



M3.4 | manyet: an R package for multimodal network analysis and more

James Hollway (Graduate Institute, Geneva)
Henrique Sposito (Geneva Graduate Institute)

This workshop introduces manyet (previously migraph), an R package for the analysis of many networks. The package aims to make learning, teaching, and applying network analysis easier across a wider range of types of networks.

The package includes measures of network, tie, and node centrality, cohesion, closure, and diversity, and routines to count motifs and identify roles and community membership. It also includes CUG and QAP tests and models, blockmodelling, and network diffusion and learning models.

The package operates with many common formats, classes, and types of network. There are read and write functions for several common external formats, including edgelist, Pajek, and UCINET, as well as coercion to and from common R classes, such as matrices and dataframes, as well as igraph, network, and tidygraph objects. All functions in the package work for all classes and a wide range of types of networks: e.g. (un)directed, (un)weighted, (un)signed, as well as one-mode, two-mode and three-mode networks, using sensible defaults and appropriate normalisations.

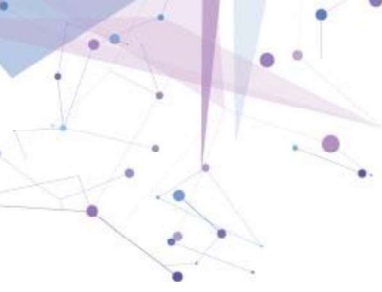
The goal of this workshop is to introduce participants to the package through tutorials using multimodal network data. Familiarity with R and RStudio is recommended. Participants can bring their own research problems and data and, depending on the number of participants, remaining time can be used to discuss them.

M6.1 | Egocentric network analysis with R

Raffaele Vacca (University of Milan)

This workshop is an introduction to the R programming language and its tools to represent, manipulate and analyze egocentric or personal network data. Topics include: introduction to ego-network research and data; introduction to data structures and network objects in R; visualizing ego-networks; calculating measures on ego-network composition and structure; converting ego-network measures to R functions; applying these functions to many ego-networks. The workshop emphasizes R tidyverse packages for data science, showing how they can be used to easily conduct common operations in ego-network analysis and scale them up to large collections of networks. We'll cover specific packages for network analysis (igraph, network, egor), data management (dplyr) and programming (purrr). No previous familiarity with R is required; participants only need a laptop with R and RStudio installed. This workshop has been taught for the past ten years at different international conferences, including INSNA's Sunbelt and EUSN meetings. It draws on concepts and methods discussed in "Conducting personal network research: A practical guide" by Christopher McCarty, Miranda Lubbers, Raffaele Vacca and José Luis Molina (Guilford Press). More details on the workshop's materials, history and instructor are here:

www.raffaelevacca.com/egonet-r.



7th European Conference on **Social Networks**



M6.2 | Advanced RSiena workshop

Tom A.B. Snijders (University of Groningen / University of Oxford)

This workshop is intended for participants who have experience in working with RSiena. Topics treated will be the following – all in the framework of modelling network panel data using the RSiena package.

- Multivariate networks: cross-network effects; with attention to the associated hierarchy requirements.
- Two-mode networks.
- Co-evolution of two-mode and one-mode networks.
- Valued networks (two kinds: networks with weak and strong ties; signed networks).
- Multilevel estimation using sienaBayes.
- Parameter interpretation: semi-standardized parameters: entropy-based approach to explained variation.
- If participants have specific questions, they can pose these in advance in an email to Tom Snijders.

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

M6.3 | Social Network Analysis Workshop: How do I develop and answer my research question?

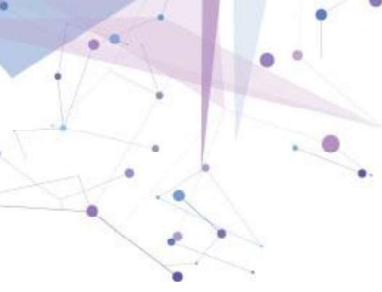
Filip Agneessens (University of Trento)

Starting a network study can be rather challenging. This workshop offers a framework for translating your general research objective into concrete research questions (and hypotheses), and discusses way to approach your study. We will explore questions such as:

- Which nodes (individuals, organizations, ...) should I include in my study, and which ones should I exclude? I.e., how do I delineate my network?
- Should I consider analyzing a single network? Or should I study multiple networks?
- If I use a survey, how do I best collect network data? What are some issues to look out for when developing survey questions?
- Should I perform a dyadic, individual or network level analysis? Or should I maybe combine different levels?
- Given my focus on a specific level, which network measures should I consider?
- Should I perform statistical analysis? And if so, which type of analysis should I consider? Is my network the independent variable, the dependent variable or both?

To answer these questions about data collection and data analysis, we will be primarily relying on the following resources:

- Agneessens, F. (2020). Dyadic, nodal and group-level approaches to study the antecedents and consequences of networks: Which social network models to use and when? In *The Oxford Handbook of Social Networks*, edited by Ryan Light and James Moody. Oxford University Press.
- Agneessens, F., & Labianca, G. J. (2022). Collecting survey-based social network information in work organizations. *Social Networks* 68, 31-47.
- Borgatti, S. P., Everett, M. G., Johnson, J. C., & Agneessens, F. (2022). *Analyzing Social Networks Using R*. SAGE.



7th European Conference on **Social Networks**



M6.4 | The Analysis of Longitudinal Social Network Data using RSIENA

Robert W Krause (University of Kentucky)

This workshop is about analyzing social networks panel data, understood here as two or more repeated observations of a network on a given node set (usually between 20 and a few hundred nodes). The workshop teaches the stochastic actor-oriented model to analyze such data, for an introduction see Snijders, Steglich, & van de Bunt (2010). The method is implemented in the RSiena, package in the R software.

The model also includes options for multiple dependent variables to co-evolve. These can be multiple networks, influencing each other during their evolution or network(s) and nodal attributes (e.g., to investigate if an observed homophily on drinking is due to selection - i.e. network choices - or due to influence - i.e. attribute changes).

The first part of the workshop will focus on the intuitive understanding of the model and operation of the software. The second part will present models for the simultaneous dynamics of networks and behavior and other more advanced topics such as model specification, multivariate networks, and goodness of fit checking. Further information about this method can be found at the SIENA website

(<http://www.stats.ox.ac.uk/~snijders/siena>).

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, RStudio (or a different compiler they are familiar with), 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 (<https://r4ds.had.co.nz/>). This is to reduce the amount of new material to digest at the workshop itself. Further instructions will be given before the conference starts.

F3.1 | Tidy Networks: the tidyverse and tidygraph for social network analysis in R

Matthew Smith (Edinburgh Napier University)

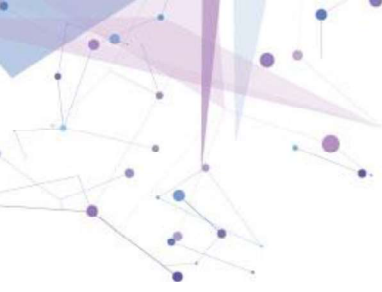
Yasaman Sarabi (Edinburgh Business School, Heriot-Watt University)

This 3-hour workshop provides an introduction to the R programming language for those without any previous or limited experience. It will introduce the tidyverse – a set of functions and packages for data processing, cleaning, and visualisation in R. In particular, we will focus on dplyr for data processing, ggplot2 for visualisation, and Rmarkdown for creating reports. We will go on to demonstrate how the tidyverse can be applied to social network analysis - more specifically through the use of the tidygraph package. The tidygraph permits you to utilise the underlying grammar structure of the tidyverse when dealing with graph objects in R. By using the tidygraph package you can manage edgelist and network attributes in a single object, along with implementing analysis on these objects. The tidyverse allows you to create tidy data frames, whilst the tidygraph allows you to create tidy graph objects – or tidy networks!

Learning Outcomes:

By the end of the session participants should be able to:

- Use R and RStudio.
- Make use of the tidyverse for data processing – more specifically preparing datasets for SNA.
- Visualising networks in R using ggplot2 (part of the tidyverse) and tidygraph.
- Create tidygraph objects and undertake some initial network analysis using the tidygraph package.



7th European Conference on **Social Networks**



Target group: Individuals new to R, or those with limited R experience. These users will benefit from gaining an insight into how to use R for data processing and social network analysis following the tidy philosophy.

Requirements: No prior knowledge of R is required as an introduction will be provided.

Matthew Smith is a lecturer at Edinburgh Napier University. Yasaman Sarabi is an assistant professor at Edinburgh Business School, Heriot-Watt University.

F3.2 | Analyzing negative and signed networks

Filip Agneessens (University of Trento)

Negative ties (such as dislike, conflict, bullying and avoidance) are increasingly being studied. However, classic measures applied to positive (and neutral) ties do not generally work well for negative ties. In this workshop we explore specific measures and approaches to study negative and signed networks.

- We discuss how to measure negative ties
- Identify differentiate types of signed networks
- Explore centrality measures for negative and signed networks, including the PII and PN index
- Explore ways to measure "cohesion" for negative and signed networks
- Discuss ways to study balance theory
- Touch upon structural equivalence and blockmodeling

Background reading:

- Everett, M & Borgatti, S. (2014) Networks containing negative ties. *Social Networks* 38, 111–120.
- Harrigan, N.M., Labianca, G., & Agneessens, F. (2020). SPECIAL ISSUE: Social Network Research on Negative Ties and Signed Graphs. *Social Networks* 60, 1-146.
- Agneessens, F. (forthcoming). Negative Ties and Signed Networks. *The Sage Handbook of Social Network Analysis*. (Second Edition). Edited by John McLevey, Peter J. Carrington, and John Scott. Sage Publications

F3.3 | Mixed Methods Research into Social Networks

Betina Hollstein (University of Bremen)

Elisa Bellotti (University of Manchester)

The workshop focuses on the use of mixed methods research designs when studying whole and ego-centered social networks. The workshop will be conducted in two parts. The first part introduces social network qualitative research and the principles of mixed methods research designs and its contributions to the study of social networks, pointing out advantages and challenges of this approach. Illustrations of the theoretical and methodological aspects are given by bringing examples from a variety of fields of research. The second part is devoted to the presentation of concrete procedures to apply mixed methods in network research both at the level of data collection and analysis. This part includes an introduction of different approaches to the collection of whole and ego-centered network data, i.e. interviews, ethnographic methods, archival data, together with visual instruments. It then moves to the analysis of the quantitative and qualitative dimensions of network relationships and structures in a mixed method perspective.



F3.4 | The goldfish package in R

Christoph Stadtfeld (ETH Zürich)

James Hollway (Graduate Institute, Geneva)

Marion Hoffman (Institute for Advanced Study in Toulouse)

Alvaro Uzaheta (ETH social networks lab)

Goldfish is an R package for analyzing relational event data using a variety of models. In particular, it implements different types of Dynamic Network Actor Models (DyNAMs), a class of models tailored to the study of actor-oriented processes. Goldfish also implements different versions of tie-oriented relational event models.

The workshop participants will learn to describe relational event data in R, estimate different models with the goldfish package, inspect and interpret results. In the final part, we discuss extensions to the DyNAM framework and current developments.

Prerequisites: Course participants should be familiar with R and model-based statistical inference (such as logistic regression). They are expected to bring their laptop to the course with the R statistical software environment, goldfish package, and dependencies installed.

F3.5 | Empirically calibrated network simulations

Christian E.G. Steglich (University of Groningen AND Linköping University)

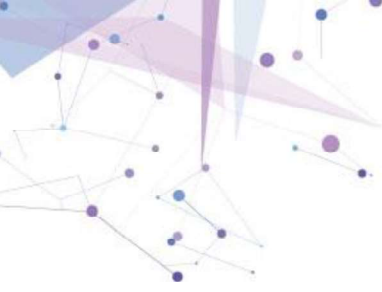
How much can observed network distances between ethnic groups be explained by in-group clustering, or by out-group avoidance? To what degree does performance homogeneity in advice seeking networks result from selecting advisors, or from being influenced by them? How much does it matter for innovation adoption when a network is rewired while a diffusion process unfolds on it?

All these questions seek to explain an emergent macro-level outcome while invoking competing micro-level explanatory mechanisms. In the presence of information-rich social network data, this becomes a task of statistical quantification. But what are suitable tools for such a quantification exercise?

Two such tools are exponential random graph models (ERGM; Lusher, Koskinen & Robins, 2013) and stochastic actor-oriented models (SAOM; Snijders, van de Bunt & Steglich, 2010). They were developed to facilitate the testing of behavioral (micro-level) theories of social action in an interdependent social network setting. These models are computationally complex. Their calibration to longitudinal (SAOM) or cross-sectional (ERGM) network data is achieved by means of simulation-based statistical inference. The simulation framework developed for calibration purposes can also be used for other goals, such as the study of emergent macro-phenomena (Snijders & Steglich, 2015; Steglich & Snijders, 2022). This workshop will focus on principles and concerns of such studies, and give showcase examples how to implement such simulations.

As preparatory reading, this open-source handbook chapter may be consulted:

- Steglich, Ch., and T.A.B. Snijders (2022). Stochastic network modeling as generative social science. In: *Handbook of Sociological Science* (pp. 73-99). Edward Elgar Publishing.



7th European Conference on **Social Networks**



F3.6 | Social Network Analysis in Stata

Thomas U. Grund (RWTH Aachen University)

This workshop introduces the nwcommands – a software suite of over 100 Stata commands – for social network analyses in Stata. The software includes programs for importing and exporting, loading and saving, handling, manipulating and replacing, generating, and visualizing and animating networks. It also includes commands for measuring the importance of network nodes, the detection of network patterns and features, the similarity of multiple networks, node attributes, and the advanced statistical analysis of networks including. This workshop gives several examples using these programs.