

Statistical Models for Social Network Analysis

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The workshop gives a general introduction in statistical methods and models for the analysis of social networks. It is based upon the general question: How do we determine which type of statistical analysis is appropriate to analyze network data? To answer this question, statistical analyses are linked to research questions that are interesting from a statistical point of view (Huisman & van Duijn 2004):

- (1) How can properties of networks and actors be described, compared, and categorized?
- (2) How can the association between ties with one network and between networks on the one hand, and between network ties and actor characteristics on the other hand be described and modeled?
- (3) How do networks develop over time and influence each other?

Statistical methods that can answer these kind of questions include, amongst others, exponential random graph models (van Duijn et al. 2004; Wasserman & Pattison 1996) and actor oriented model for network dynamics (Snijders 2001).

The morning sessions of the workshop will focus on statistical network descriptives (like degrees, dyad and triad census, combined with distributional properties) and visualization techniques (as they are available in software packages, Huisman & van Duijn 2005). Also the analysis of relations within and between networks, and between networks and actors by using exponential random graph models will be discussed, as well as some other methods to answer the second research question. The afternoon starts with a session on the analysis of multiple networks and network dynamics, and ends with a tutorial on StOCNET (Boer et al. 2004), a free software program for the statistical analysis of social networks (Huisman & van Duijn 2003).

Program

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| 10.00-11.30 | General introduction.
Statistical network descriptives and visualization techniques. |
| 11.45-13.00 | Models for predicting relations within and between networks, with or without actor attributes. Focus on exponential random graph models. |
| 14.00-15.30 | Dynamic network models, and the analysis of multiple networks. Focus on stochastic actor-oriented models. |
| 15.45-17.30 | Tutorial on StOCNET (free software for social network analysis). |

Material and information

Material (papers, manuals, programs) and information can be found on the workshop website at <http://www.ppsw.rug.nl/~huisman> – click Workshop IMPS.

References

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- Van Duijn, M.A.J., Snijders, T.A.B., & Zijlstra, B.J.H. (2004). p_2 : a random effects model with covariates for directed graphs. *Statistica Neerlandica*, 58, 234-254.
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