Course

Network Analysis

- Dates: September – October 2014
- University: University of Amsterdam
- Location: Amsterdam, The Netherlands

This course was part of the Psychological Research Methods specialization in the Research Master Psychology program.

Week 1: Introduction to Network Analysis

Lecturer: Sacha Epskamp

- Lecture slides: Introduction to Network Analysis
- Practical slides: Introduction to R

Literature:

- A (very) short introduction to R
- The Network Takeover
- Comorbidity: A Network Perspective
- Network Analysis: An Integrative Approach to the Structure of Psychopathology

Week 2: Correlational Structures

Lecturer: Sacha Epskamp

- Lecture slides: Correlational Structures
- Practical slides: Making Graphs in R

Literature:

- qgraph: Network Visualizations of Relationships in Psychometric Data
- Dimensions of Normal Personality as Networks in Search of Equilibrium: You Can't Like Parties if You Don't Like People

Week 3: Network Descriptives

Lecturer: Sacha Epskamp

- Lecture slides: Descriptive Analysis of Network Graph Characteristics

- Practical slides: Network Descriptives using qgraph

Literature:

- State of the aRt personality research: A tutorial on network analysis of personality data in R
- The small world of psychopathology
- Node centrality in weighted networks: Generalizing degree and shortest paths
- Collective dynamics of 'small-world'networks

Week 4: Causal Networks

Lecturer: Denny Borsboom

- Lecture slides: Causal Networks
- Lecture handout

Literature:

- Lecture notes: d-separation
- Judea Pearl – Causality (chapter 1 and epilogue)

Week 5: Directed Network Discovery

Lecturer: Claudia van Borkulo

- Lecture slides: Graphs, probability, discovery, and causality

Literature:

- Lecture notes
- Cosma Shalizi: Discovering Causal Structure from Observations
- Causal Inference Using Graphical Models with the R Package pcalg
- bnlearn website

Week 6: Markov Random Fields

- Lecture slides part 1: Introduction to Markov Random Fields (PDF)
- Lecture slides part 2: Non-normality and LASSO Estimation (PDF)

Literature:

- State of the aRt personality research: A tutorial on network analysis of personality data in R
- A new method for constructing networks from binary data
- A new method for constructing networks from binary data: Supplementary Information