CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information

# *Contents*

*List of Figures* *page* xiii
*List of Tables* xix
*Preface to the Third Edition* xxi
*Preface to the Second Edition* xxiii
*Preface to the First Edition* xxv
Overview xxvi
Justification xxviii
Acknowledgments xxix

PART I FUNDAMENTALS

1 Looking for Social Structure 3
1.1 Introduction 3
1.2 Sociometry and Sociogram 3
1.3 Exploratory Social Network Analysis 5
1.3.1 Network Definition 6
1.3.2 Manipulation 12
1.3.3 Calculation 15
1.3.4 Visualization 17
1.4 Assembling a Social Network 27
1.5 Summary 30
1.6 Questions 31
1.7 Assignment 32
1.8 Further Reading 32
1.9 Answers 33

2 Attributes and Relations 36
2.1 Introduction 36
2.2 Example: The World System 36
2.3 Partitions 38



© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information



2.4 Reduction of a Network 45
2.4.1 Local View 46
2.4.2 Global View 48
2.4.3 Contextual View 51
2.5 Vectors and Coordinates 53
2.6 Network Analysis and Statistics 61
2.7 Summary 63
2.8 Questions 64
2.9 Assignment 65
2.10 Further Reading 65
2.11 Answers 66

PART II COHESION

3 Cohesive Subgroups 73
3.1 Introduction 73
3.2 Example 73
3.3 Density and Degree 75
3.4 Components 79
3.5 Cores 83
3.6 Cliques and Complete Subnetworks 86
3.7 Summary 92
3.8 Questions 94
3.9 Assignment 96
3.10 Further Reading 96
3.11 Answers 96

4 Sentiments and Friendship 99
4.1 Introduction 99
4.2 Balance Theory 99
4.3 Example 103
4.4 Detecting Structural Balance and Clusterability 103
4.5 Development in Time 109
4.6 Summary 113
4.7 Questions 113
4.8 Assignment 115
4.9 Further Reading 115
4.10 Answers 116

5 Affiliations 119
5.1 Introduction 119
5.2 Example 120
5.3 Two-Mode and One-Mode Networks 121
5.4 Islands 127

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information



5.5 Communities 132
5.6 The Third Dimension 135
5.7 Summary 139
5.8 Questions 140
5.9 Assignment 141
5.10 Further Reading 141
5.11 Answers 142

PART III BROKERAGE

6 Center and Periphery 149
6.1 Introduction 149
6.2 Example 149
6.3 Distance 151
6.4 Betweenness 158
6.5 Eigenvector Centrality 160
6.6 Assortativity 162
6.7 Summary 164
6.8 Questions 165
6.9 Assignment 166
6.10 Further Reading 167
6.11 Answers 167

7 Brokers and Bridges 170
7.1 Introduction 170
7.2 Example 171
7.3 Bridges and Bi-Components 172
7.4 Ego-Networks and Constraint 177
7.5 Affiliations and Brokerage Roles 184
7.6 Summary 189
7.7 Questions 190
7.8 Assignment 191
7.9 Further Reading 193
7.10 Answers 194

8 Diffusion 197
8.1 Example 197
8.2 Contagion 200
8.3 Exposure and Thresholds 204
8.4 Critical Mass 211
8.5 Summary 216
8.6 Questions 217
8.7 Assignment 219
8.8 Further Reading 219
8.9 Answers 220

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information



PART IV RANKING

9 Prestige 225
9.1 Introduction 225
9.2 Example 226
9.3 Popularity and Indegree 227
9.4 Correlation 229
9.5 Domains 231
9.6 Proximity Prestige 235
9.7 Summary 238
9.8 Questions 238
9.9 Assignment 240
9.10 Further Reading 241
9.11 Answers 241

10 Ranking 244
10.1 Introduction 244
10.2 Example 245
10.3 Triadic Analysis 245
10.4 Acyclic Networks 253
10.5 Symmetric-Acyclic Decomposition 256
10.6 Summary 261
10.7 Questions 263
10.8 Assignment 265
10.9 Further Reading 265
10.10 Answers 266

11 Genealogies and Citations 269
11.1 Introduction 269
11.2 Example I: Genealogy of the Ragusan Nobility 269
11.3 Family Trees 270
11.4 Social Research on Genealogies 278
11.5 Example II: Citations among Papers on Network Centrality 289
11.6 Citations 291
11.7 Summary 304
11.8 Questions 304
11.9 Assignment 1 306
11.10 Assignment 2 306
11.11 Further Reading 306
11.12 Answers 307

PART V MODELING

12 Blockmodels 315
12.1 Introduction 315

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information



12.2 Matrices and Permutation 316
12.3 Roles and Positions: Equivalence 322
12.4 Blockmodeling 331
12.4.1 Blockmodel 332
12.4.2 Blockmodeling 333
12.4.3 Regular Equivalence 338
12.5 Summary 343
12.6 Questions 345
12.7 Assignment 347
12.8 Further Reading 348
12.9 Answers 348

13 Random Graph Models 353
13.1 Introduction 353
13.2 Example 355
13.3 Modeling Overall Network Structure 357
13.3.1 Classic Uniform Models 358
13.3.2 Small-World Models 362
13.3.3 Preferential Attachment Models 366
13.4 Monte Carlo Simulation 373
13.5 Summary 377
13.6 Questions 379
13.7 Assignment 381
13.8 Further Reading 381
13.9 Answers 383

Appendix 1 Getting Started with Pajek 387
A1.1 Installation 387
A1.2 Network Data Formats 387
A1.3 Creating Network Files for Pajek 389
A1.3.1 Within Pajek 389
A1.3.2 Helper Software 391
A1.3.3 Word Processor 392
A1.3.4 Relational Database 394
A1.4 Limitations 400
A1.5 PajekXXL and Pajek3XL 400
A1.6 Updates of Pajek 402

Appendix 2 Exporting Visualizations 404
A2.1 Export Formats 404
A2.1.1 Bitmap and JPEG 404
A2.1.2 Encapsulated PostScript 405
A2.1.3 Scalable Vector Graphics 406
A2.1.4 VOSviewer 408
A2.1.5 Virtual Reality Modeling Language and X3D 409

© in this web service Cambridge University Press & Assessment www.cambridge.org

CAMBRIDGE
Cambridge University Press & Assessment
978-1-108-46227-3 — Exploratory Social Network Analysis with Pajek
Wouter De Nooy, Andrej Mrvar, Vladimir Batagelj
Table of Contents
More Information



A2.1.6 MDL MOL and Kinemages 410
A2.2 Layout Options 411
A2.2.1 Top Frame on the Left: EPS/SVG Vertex Default 412
A2.2.2 Bottom Frame on the Left: EPS/SVG Line Default 416
A2.2.3 Top Frame on the Right 418
A2.2.4 Middle Frame on the Right – Background Colors 419
A2.2.5 Bottom Frame on the Right – EPS Border 420

Appendix 3 Installing Pajek on Mac OS X 421

Appendix 4 Shortcut Key Combinations 424
A4.1 Main Screen 424
A4.2 Hierarchy Edit Screen 425
A4.3 Draw Screen 425

*Glossary* 427
*Index of Pajek and R Commands* 439
*Subject Index* 445

© in this web service Cambridge University Press & Assessment www.cambridge.org