

Workshop on Social Network Analysis

Indian Institute of Management Kozhikode

April 12-23, 2021

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WORKSHOP DESCRIPTION

This workshop examines the theoretical and statistical analysis of social networks from an interdisciplinary perspective. Participants learn about the nature, structures, and dynamics of social networks that are relevant to fields such as management, public health, sociology, politics, psychology, economics, and anthropology. The workshop covers the ontology of networks, major theoretical approaches, common research designs, descriptive statistics, and a variety of techniques for statistical inference. The workshop, conducted virtually over Zoom, includes didactic sessions, hands-on computer exercises, and individualized projects by participants. The principal goal of workshop is for participants to learn to conduct their own empirical research on social networks on a variety of topics.

REQUIREMENTS

Participants are required to attend at least 18 of the 20 sessions of the workshop. Absence from 3 or more sessions will be grounds for discontinuation of participation.

Participants are expected to complete assigned readings in advance of each session and to participate actively in the sessions. (Nonparticipation is equivalent to absence.)

Participants are expected to work actively on computer exercises during the six sessions when they are featured.

Each participant is expected to work individually on a social-network-relevant empirical research project and to present preliminary statistical results from this project on April 23.

BOOKS REQUIRED FOR PURCHASE

John T. Scott. 2017. *Social Network Analysis*, 4TH edition. London: Sage.
https://www.amazon.co.uk/Social-Network-Analysis-John-Scott-dp-1473952123/dp/1473952123/ref=dp_ob_image_bk

Skyler J. Cranmer, Bruce A. Desmarais, and Jason W. Morgan. 2020. *Inferential Network Analysis*. New York: Cambridge University Press.
https://www.amazon.co.uk/Inferential-Network-Analysis-Analytical-Research/dp/1316610853/ref=sr_1_1?dchild=1&keywords=inferential+network+analysis&qid=1610302795&s=books&sr=1-1

OUTLINE FOR WORKSHOP

Monday, April 12

Morning (10am to Noon): Welcome, course procedures, requirements, and objectives

- Required reading: John T. Scott. 2017. *Social Network Analysis*, 4th edition. London: Sage. Pages 1-40.
- Required reading: Mustafa Emirbayer. 1997. "Manifesto for a Relational Sociology." *American Journal of Sociology* 103 (2): 281-317.

Afternoon (2pm to 4pm): Lecture on core concepts in social network analysis

- Required reading: Ronald L. Breiger. 1974. "The Duality of Persons and Groups." *Social Forces* 53 (2): 181-190.
- Required reading: Linton C. Freeman. 1977. "A Set of Measures of Centrality Based on Betweenness." *Sociometry* 40 (1): 35-41.
- Required reading: Duncan Watts. 1999. *Small Worlds: The Dynamics of Networks Between Order and Randomness*. Princeton: Princeton University Press. Pp. 3-40.
- Required reading: Steven Strogatz. 2010. "The Enemy of My Enemy." *New York Times* (February 14).

Tuesday, April 13

Morning (10am to Noon): Lecture on major theoretical approaches

- Required reading: Mark Granovetter. 1973. "The Strength of Weak Ties." *American Journal of Sociology* 78 (6): 1360-1380.
- Required reading: Roger V. Gould and Roberto M. Fernandez. 1989. "Structures of Mediation: A Formal Approach to Brokerage in Transaction Networks." *Sociological Methodology* 19: 89-126.
- Required reading: Ronald S. Burt. 1992. *Structural Holes: The Social Structure of Competition*. Cambridge, MA: Harvard University Press. Pp. 8-49.
- Required reading: Joel M. Podolny. 2001. "Networks as the pipes and prisms of the market." *American Journal of Sociology* 107 (1): 33-60.
- Required reading: Miller McPherson, Lynn Smith-Lovin, and James M. Cook. 2001. "Birds of a Feather: Homophily in Social Networks." *Annual Review of Sociology* 27: 415-444.

Afternoon (2pm to 4pm): Lecture on common research designs

- Required reading: John T. Scott. 2017. *Social Network Analysis*, 4th edition. London: Sage. Pp. 41-56.
- Required reading: Edward O. Laumann, Peter V. Marsden, and David Prensky. 1983. "The Boundary Specification Problem in Network Analysis." Pp. 18-34 in Ronald S. Burt and Michael Minor, eds., *Applied Network Analysis*, eds. Beverly Hills, CA: Sage.
- Required reading: Douglas D. Heckathorn. 1997. "Respondent-Driven Sampling: A New Approach to the Study of Hidden Populations." *Social Problems* 44 (2): 174-199.
- Required reading: David Krackhardt. 1992. "The Strength of Strong Ties: The Importance of Philos in Organizations." Pp. 216-239 in Nitin Nohria and Robert Eccles, eds., *Networks and Organizations: Structure, Form, and Action*. Boston, MA: Harvard Business School Press.

Wednesday, April 14

Morning (10am to Noon): Computer exercises (#1) on visualizing networks

- Required reading: Carter T. Butts. 2008. "network: A Package for Managing Relational Data in R." *Journal of Statistical Software* 24 (2): 1-36.
- Required reading: Carter T. Butts. 2008. "Social Network Analysis with sna." *Journal of Statistical Software* 24 (6): 1-51.

Afternoon (2pm to 4pm): Lecture on descriptive statistics

- Required reading: John T. Scott. 2017. *Social Network Analysis*, 4th ed. London: Sage. Pp. 57-136.

Thursday, April 15

Morning (10am to Noon): Computer exercises (#2) on descriptive statistics

- Required reading (repeated): Carter T. Butts. 2008. "Social Network Analysis with sna." *Journal of Statistical Software* 24 (6): 1-51.

Afternoon (2pm to 4pm): Lecture on Exponential Random Graph Models (ERGMs)

- Required reading: Skyler J. Cranmer, Bruce A. Desmarais, and Jason W. Morgan. 2020. *Inferential Network Analysis*. New York: Cambridge University Press. Pp. 1-115.
- Required reading: Skyler J. Cranmer, Philip Leifeld, Scott D. McClurg, and Meredith Rolfe. 2017. "Navigating the Range of Statistical Tools for Inferential Network Analysis." *American Journal of Political Science* 61 (1): 237-251.

Friday, April 16

Morning (10am to Noon): Computer exercises (#3) on ERGMs

- Required reading: David R. Hunter, Mark S. Handcock, Carter T. Butts, Steven M. Goodreau, and Martina Morris. 2008. "ergm: A Package to Fit, Simulate and Diagnose Exponential-Family Models for Networks." *Journal of Statistical Software* 24 (3): 1-29
- Required reading: Martina Morris, Mark S. Handcock, and David R. Hunter. 2008. "Specification of Exponential-Family Random Graph Models: Terms and Computational Aspects." *Journal of Statistical Software* 24 (4): 1-24.
- Required reading: Michael T. Heaney. 2014. "Multiplex Networks and Interest Group Influence Reputation: An Exponential Random Graph Model." *Social Networks* 36 (1): 66-81.
- Required reading: Michael T. Heaney and Philip Leifeld. 2018. "Contributions by Interest Groups to Lobbying Coalitions." *Journal of Politics* 80 (2): 494-509

Afternoon (10am to Noon): Individualized consultations

Monday, April 19

Morning (10am to Noon): Lecture on Temporal Exponential Random Graph Model (TERGMs)

- Required reading: Skyler J. Cranmer, Bruce A. Desmarais, and Jason W. Morgan. 2020. *Inferential Network Analysis*. New York: Cambridge University Press. Pp. 116-147.
- Required reading: Philip Leifeld and Skyler J. Cranmer. 2019. "A theoretical and empirical comparison of the temporal exponential random graph model and the stochastic actor-oriented model." *Network Science* 7 (1): 20-51.

Afternoon (2pm to 4pm): Computer exercises (#4) on TERGMs

- Required reading: Philip Leifeld, Skyler J. Cramner, and Bruce A. Desmarais. "Temporal Exponential Random Graph Models with btergm: Estimation and Bootstrap Confidence Intervals." *Journal of Statistical Software* 83 (6):1-36.

Tuesday, April 20

Morning (10am to Noon): Valued-Edge ERGMs: The Generalized ERGM (GERGM)

- Required reading: Skyler J. Cranmer, Bruce A. Desmarais, and Jason W. Morgan. 2020. *Inferential Network Analysis*. New York: Cambridge University Press. Pp. 148-164.

Afternoon (2pm to 4pm): Individualized consultations

Wednesday, April 21

Morning (10am to Noon): Computer exercises (#5) on GERGM

- Required reading: Matthew J. Denny. 2016. "Getting Started with GERGM."
https://www.mjdenny.com/getting_started_with_GERGM.html

Afternoon (2pm to 4pm): Lecture on models of ego networks

- Required reading: Carter T. Butts. 2008. "A Relational Event Framework for Social Action." *Sociological Methodology* 38 (1): 155-200.
- Required reading: Mark Tranmer, Christopher Steven Marcum, F. Black Morton, Darren P. Croft, and Selvino R. de Kort. 2015. "Using the relational event model (REM) to investigate the temporal dynamics of animal social networks." *Animal Behaviour* 101: 99-105.

Thursday, April 22

Morning (10am to Noon): Computer exercises (#6) on models of ego networks

- Required reading: Carter T. Butts. 2019. "Modeling Relational Event Dynamics with statnet." 2019 Sunbelt Social Networks Conference, Montreal, Canada, June 19.

Afternoon (2pm to 4pm): Individualized Consultations

Friday, April 23

Morning (10am to Noon): Student presentations

Afternoon (2pm to 4pm): Student presentations, seminar reflections, and wrap up