

Week 07

Random networks

Tuesday, October 11

INFO 5613: Network Science

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Agenda

- Network models let us test the significance of network features and compare different networks
- Module Assignment 2: write a special call for network perspective on X in your research area
 - Due October 15
- Final assignment

Null model

- Network data violates independence assumptions in other data ...by design!
 - My weight is independent from your weight vs. my relations are independent from your relations
- Generate datasets against which the observed network can be tested
 - Simulation of a generating process → simplest is random network generation
 - Randomization of existing data → hopefully preserves some structural information
- Compare observed network statistic to distribution of network statistics in generated data
- More advanced methods like p^* /exponential random graph models (p^* /ERGMs)
 - Allow generation of more similar types of random graphs → see “Extensions” in syllabus

Module Assignment 2

Proposal for network perspectives on X

- Convening conversations are an important genre of scholarly writing
- Write up a (minimum) 1,000-word proposal on network perspectives for your research domain
- Outline
 - Motivate a gap in understanding and identify relevant network perspectives to explore it
 - Identify and summarize related work showcasing boundaries and opportunities
 - For a panel format, assemble your dream team of panelists and what each would speak about
 - For a workshop format, outline the activities that would happen among attendees
 - For a special issue format, enumerate themes you contributors could write on
 - Include logistics of deadlines, timelines, *etc.*
- Look to journals and conferences in your disciplines for examples
- Due Friday, October 15

Final assignment

What to do?

- Some interest in data collection and analysis
- Each notebook will include a section on collecting and analyzing data
 - Mostly from Wikipedia, but open to other suggestions

Next class

Readings

- Week 8 – Random networks: ER models, permutation tests, null models
- Readings
 - Farine, D. R. (2017). A guide to null models for animal social network analysis. *Methods in Ecology and Evolution*, 8(10):1309–1320
 - Faust, K. and Skvoretz, J. (2002). Comparing networks across space and time, size and species. *Sociological Methodology*, 32(1):267–299
 - One of my all-time favorite papers!