

What do LLMs know about social networks?

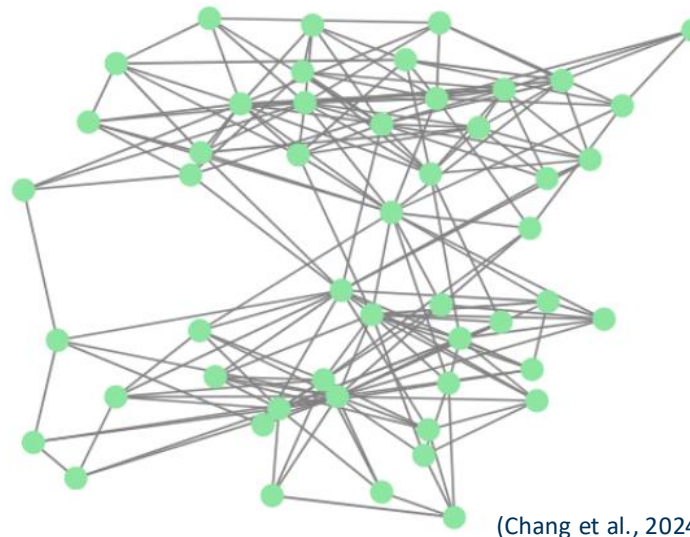
Team Project - Spring/Summer 2025

Chair of Data Science in the Economic and Social Sciences

Supervisor: Abigail Hayes

Social networks

- Representations of the connections and relationships between people
- Useful for tasks including epidemic modelling or political polarisation
- Data is often hard to access → Use models to generate synthetic social networks



Generation methods

- History of probabilistic methods based on network characteristics e.g. Erdős-Rényi models (Erdős and Rényi, 1959)
- Lack of training data for using many machine learning methods
- **Large Language Models can generate (partially) realistic networks, without network specific training data, but overemphasis the importance of political affiliation (Chang et al., 2024)**

You are a Woman, Asian, age 54, Hindu, Independent. Which of these people will you become friends with?

2. Man, White, 18, Protestant, Republican
3. Woman, Black, 39, Unreligious, Democrat

...

Team project

- Replicate the experiments of Chang et al.
- Decide on additional tasks or variations to explore
- Possible further research:
 - Measure other social network properties in the generated graphs
 - Reduce or change the biographic information
 - Vary the cultural context e.g. non-US political spectrum
 - Vary the model context e.g. specify the people are in a school or sports club

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- **Language:** English
- **Duration:** 6 months
- **Participants:** 3-5
- **Prerequisites:** Experience with Python
- **Suitable for MMDS:** Yes
- **Process:**
 - Regular meetings with the supervisor to present and discuss your progress
 - Two presentations to the chair: intermediate and final results
 - Final written report
- **Contact:** Abigail Hayes (abigail.hayes@uni-mannheim.de)

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