Final Project Proposal Network Science

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We reproduce results of the paper Structural measures of similarity and complementarity in complex networks as suggested by Carlo on MS Teams.
The main idea is to first reproduce the results on the same datasets as used in the paper to verify everything works as intended and then expand the analysis to more (social) networks, to check how the structural coefficients scale with network size. Some networks are better explained by complementarity, and others by similarity. Therefore, we investigate how both properties are affected as we scale the network size.

1 Data

We use the same datasets as in the paper (available at Netzschleuder) as well as additional (social) networks. We will create synthetic versions of those networks with varying network sizes.

2.1 Which is the logical unit of the networks?

Nodes = People
Edges/Links = Interactions between people

2.2 Are you using some specific methodology?

We will replicate the methodology of the paper, but additionally consider how the properties change with varying network sizes.

3 Research question

How do the structural coefficients (similarity and complementarity) of a social network scale with the network size?

3.1 Null model

Configuration model as used in the paper.

4 Bibliography

Talaga, S., Nowak, A. Structural measures of similarity and complementarity in complex networks. *Sci Rep* **12**, 16580 (2022). https://doi.org/10.1038/s41598-022-20710-w

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