Voting behavior and opinion similarity in Estonian MPs and MP candidates

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Problem statement and motivation

To what extent does similarity in worldview translate into similarity in voting?

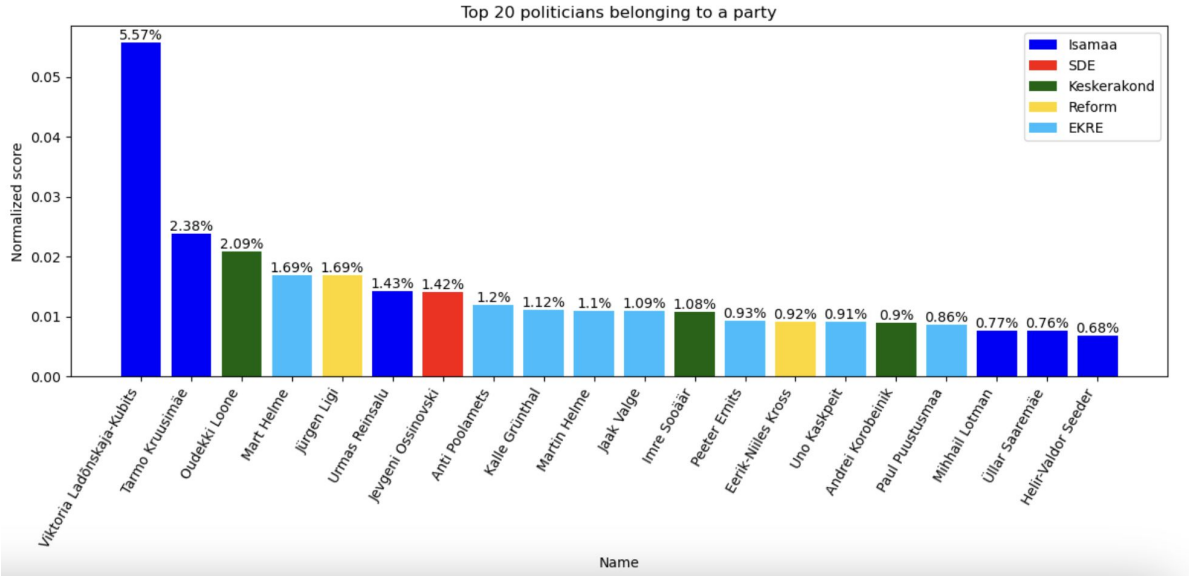
- **represent candidate parliamentary voting behavior as well as their votes in the questionnaire as graphs**
- **see to what extent similarity in worldview (as provided by the questionnaire responses) translates into similarity in parliamentary voting behavior**
- **analyze other graph patterns**

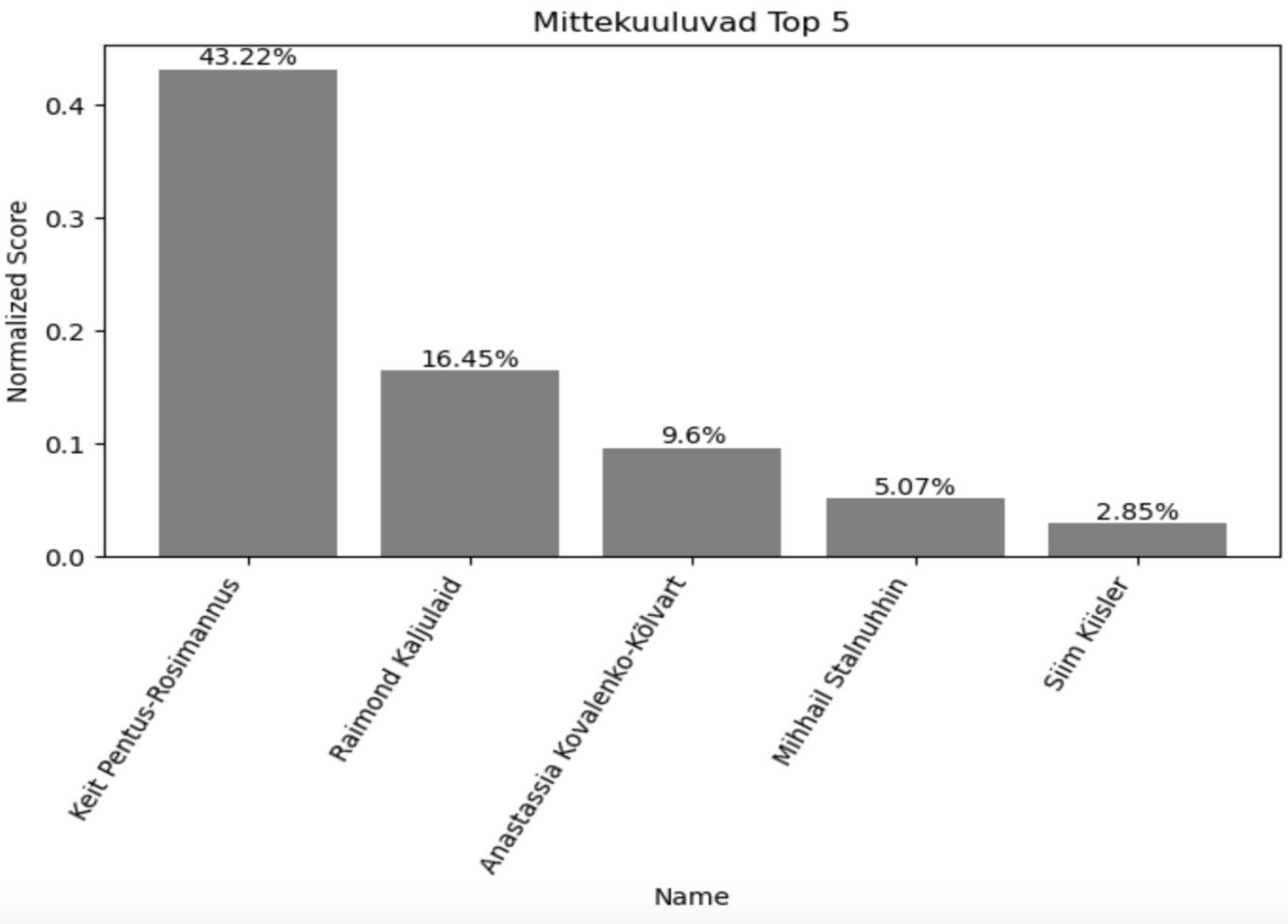
Datasets used & preprocessing

- 3 Publicly available datasets:
  - EE Parliament votes API data *api.riigikogu.ee* (~2014 - 2023) - wrote a wrapper
  - Parliament's election results data (2023) - crawled from valimised.ee
  - Hääleandja candidate opinion survey data (2023) - publicly available

Deviation of voting from party's mode

- The idea and the data
- Preprocessing
- Comparative reasons




Mittekuuluvad Top 5
Normalized Score
0.0
0.1
0.2
0.3
0.4
43.22%
16.45%
9.6%
5.07%
2.85%
Keit Pentus-Rosimannus
Raimond Kaljulaid
Anastassia Kovalenko-Kõlvart
Mihhail Stalnuhhin
Siim Kiisler
Name

Hääleandja data (candidate survey responses)

- 29 questions
- 1 - no, 2 - rather no, 3 - rather yes, 4 - yes
- 600 candidates from 8 main parties

Calculate similarity scores between candidates:

- 2 points for every exactly matching opinion (candidates answered 1-1, 2-2, 3-3 or 4-4)
- 1 point for every softly matching opinion (candidates answered 1-2, 2-1, 3-4 or 4-3)
- 0 points for non matching opinions (including if one of the candidates didn't answer at all)

Goal: predict candidate party based on opinions

Use GCN and compare with KNN as a baseline

Network and optimization

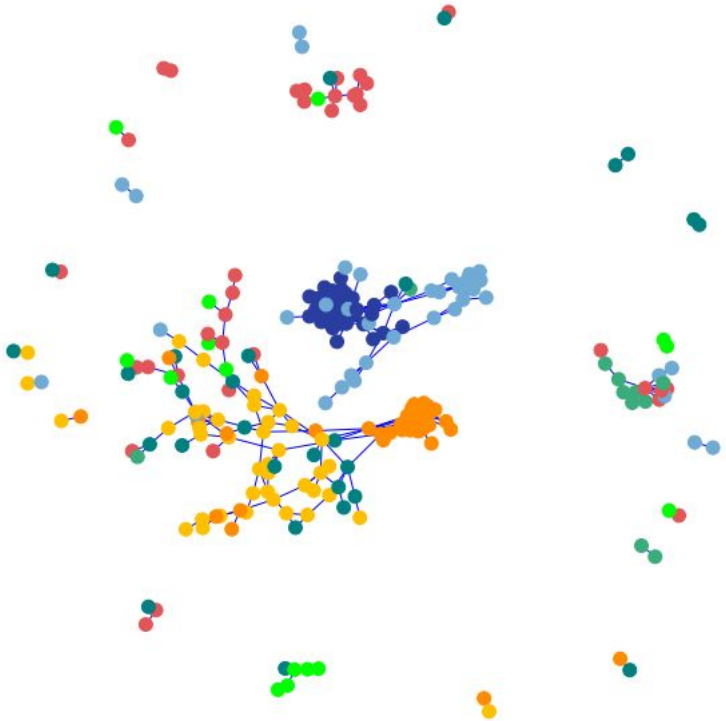
- Construct a network:
- Nodes - candidates
- Edge is present if similarity score is at least **alpha** for given two candidates

Optimize two parameters:

alpha and **convolutional layer size**

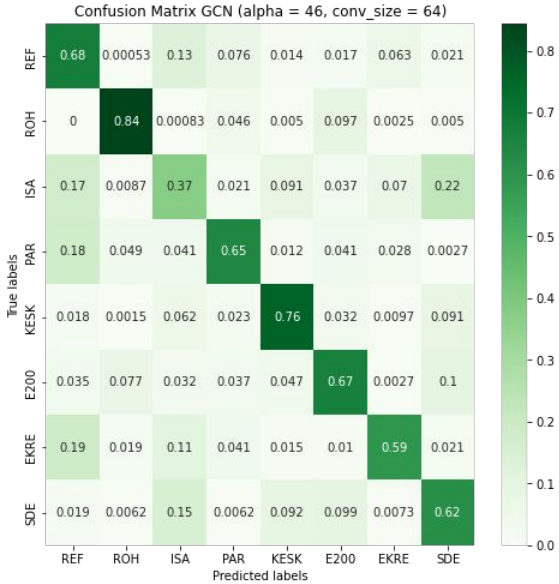
Based on test set accuracy over 100 runs

Also find best K for KNN



Results

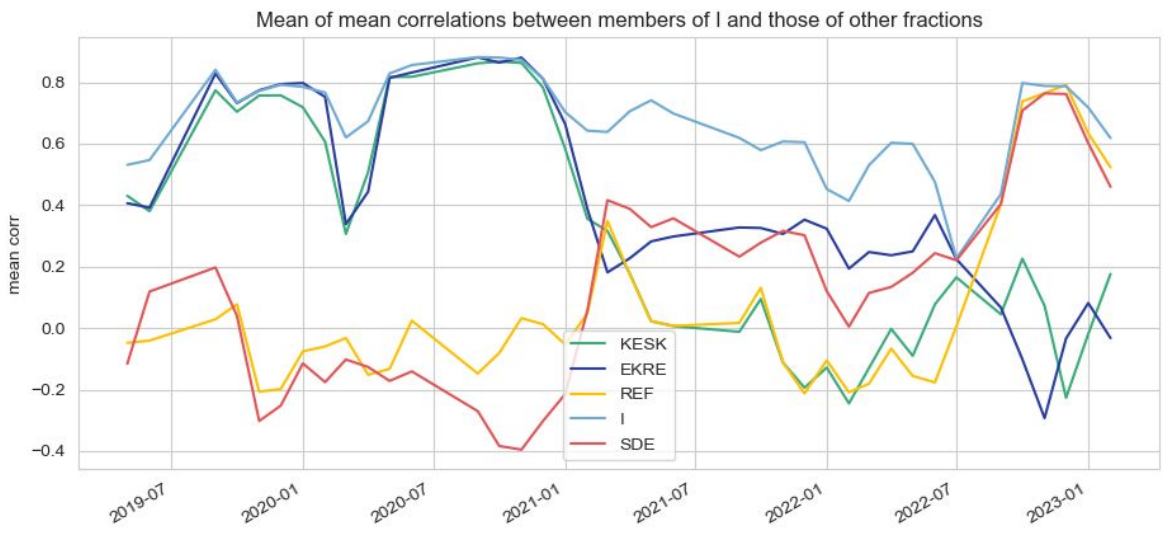
- Best KNN and GCN give very similar results in terms of accuracy (~66%)
- However the methods vary in ~33% of the predictions

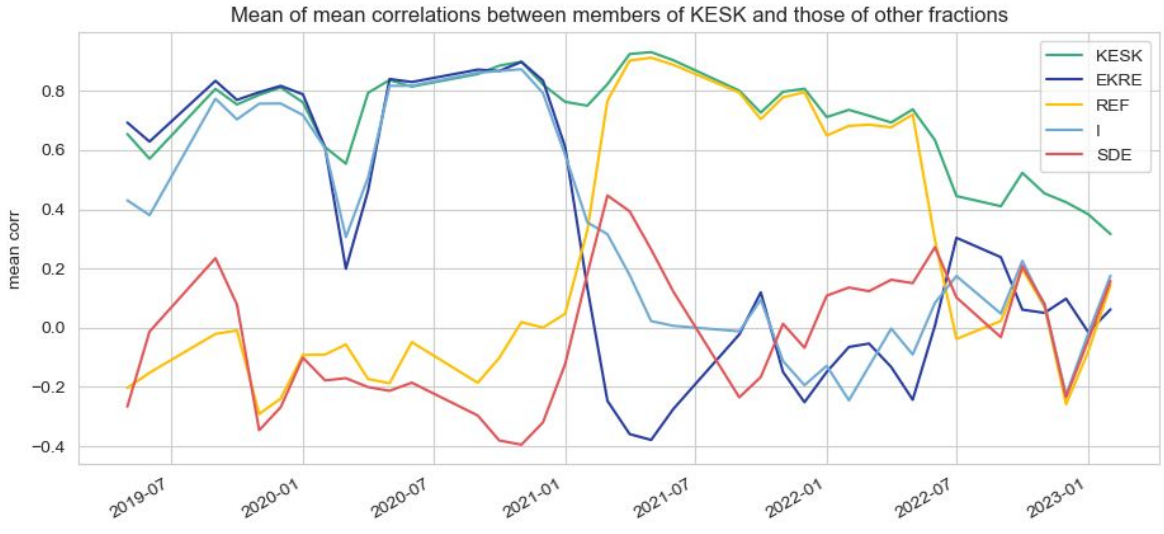


Parliament voting correlations (Parliament API)

How do the voting correlations between politicians of different parties change over time as coalitions change?

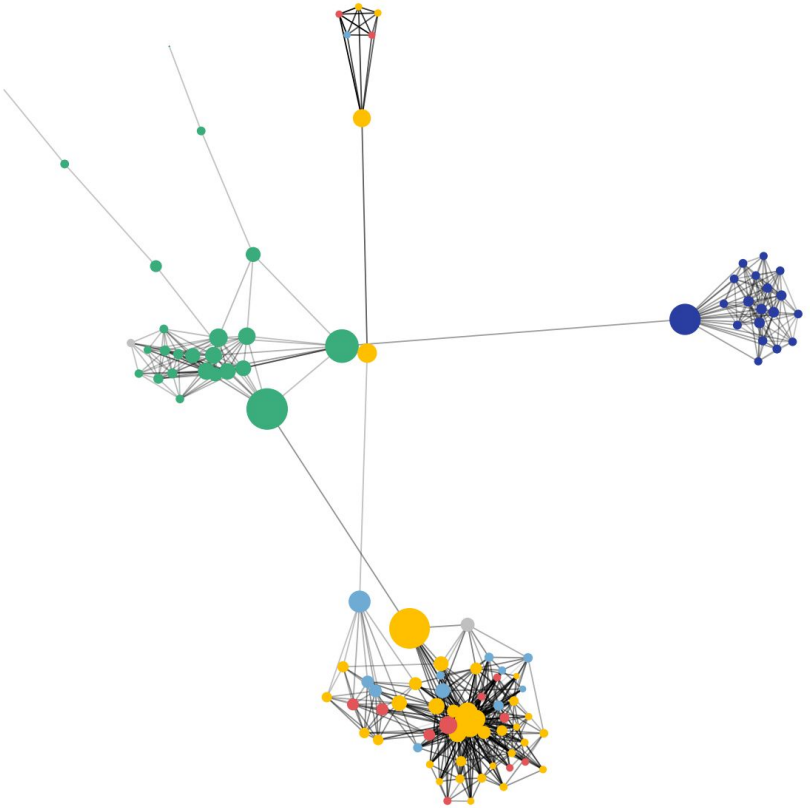
- Cohesive in coalition
- Less cohesive in opposition, even vis-a-vis own parlamentarians!





Who are linking the party clusters, according to voting data? (Parliament API)

- Data from the 52. Coalition (REF, I, SDE)
- Maximal spanning tree “skeleton” + top n edges per node (so some weak edges present to keep graph connected)
- Some information is lost
- KESK is unsurprisingly in the middle



Strong relationship between differences in self-reported worldview and in voting behavior

For every coalition from the XIV Riigikogu there is a strong positive relationship between the **pairwise similarities** (edge weights) in the MPs co-voting behavior in that period and the pairwise similarities in their worldview according to the 2023 Hääleandja.

Particularly true for EKREIKE, as it was more split along ideological lines than other coalition/opposition pairs.

	corr_Hääleandja
50_EKRE_I_KE	0.570644
51_RE_KE	0.274521
52_RE_SDE_I	0.291399
XIV Riigikogu (2019-2023)	0.467728

Conclusion

- Insights pass the sanity checks
- Possible to lossily predict party belonging from opinions based on graphs (GCN gives similarly good results as KNN)
- Coalition content affects vote behavior more than candidate opinions, but coalitions are in turn decided based on party programme ~ candidate opinions

Also see:
fedorst-parlviz.web.app

https://github.com/fedorst/parliament-vote-adjacency-viz