

October 7, 2022

F O R S C H U N G S P R A X I S

Validation and application of the recommendation system based opinion dynamics model

Problem description:

With the development of social media, people exchange opinions more often on the internet. As people tend to follow accounts that share similar opinions with them, the echo chamber where social media users only receive information similar to what they post, starts to draw researchers' attention [2]. Those works, however, didn't take the variety of topics into consideration. People who share a similar opinion on one topic may belong to the opposite group on another topic[1]. And the information exchange between them offers a possibility to bring the population back to consensus, which is crucial. Therefore a model has been proposed by us to depict the influence of the recommendation system on multi-topic opinion dynamics.

In this project, we expect the student to validate the analysis result of the built model with simulation, and apply the model to the real data from the Yelp dataset.

Knowledge of Python and Matlab is a must.

Work schedule:

- 1st-2nd week: background knowledge learning
- 3rd-4th week: simulation
- 4th-7th week: application on real data
- 7th-9th week: report and slides writing

Bibliography:

- [1] Sergey E. Parsegov, Anton V. Proskurnikov, Roberto Tempo, and Noah E. Friedkin. Novel Multidimensional Models of Opinion Dynamics in Social Networks. *IEEE Transactions on Automatic Control*, 62(5):2270–2285, May 2017. Conference Name: IEEE Transactions on Automatic Control.
- [2] B. Rastegarpanah, K. P. Gummadi, M. Crovella, and Acm. *Fighting Fire with Fire: Using Antidote Data to Improve Polarization and Fairness of Recommender Systems*. Proceedings of the Twelfth Acm International Conference on Web Search and Data Mining. 2019. 00020.

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Start: WS22/23
Delivery: 9 weeks after the start

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