Bringing Diversity in News Recommender Algorithms [1]

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In major political events and discussions, recommender algorithms play a large role in shaping opinions and setting the agenda for more traditional news media. These algorithms are used pervasively in social networks, media platforms and search engines. They determine what information is shown to the user and in which order.

Existing recommender systems focus on improving accuracy based on historic interaction-data, which has received criticism for being detrimental to the goals of improving user experience and information diversity. Their accuracy is measured in terms of predicting future user behavior based on past observation. The most popular algorithms suggest items to users based on the choices of similar users.

However, these systems are observed to promote a narrow set of already-popular items that are similar to past choices of the user, or are liked by many users. This limits users' exposure to diverse viewpoints and potentially increases polarization.

One reason for the lack of diversity in existing approaches is that they optimize for average accuracy and click rates. There are other aspects of user-experience like new information and differing viewpoints, that are not taken into account. Similarly, a high average accuracy does not necessarily mean that the algorithm is similarly accurate for different groups of users and niche items. Besides this, training data may be biased because of previous recommendations, or the data collection process.

Although information diversity is important, its definition depends heavily on the specific application and it is hard to find a general definition in the context of recommender systems. Nevertheless, there are definitions that pertain to some specific aspects of diversity, such as entropy, coverage, personalization, and surprisal.

There is a need to design recommender algorithms that balance accuracy and diversity in order to deal with the aforementioned problems. To approach this problem, we first investigated state-of-the-art algorithms and found that they promote already popular products [1]. We also found that recommender diversity depends on the optimization parameters of the algorithms [3], a factor that had not received enough attention before. In this context, we developed a graph-based method that promotes niche items without sacrificing accuracy [2]. We also developed a probabilistic latent-factor model that significantly improves the coverage and long-tail diversity of recommendations [3]. Currently, we are using these insights to develop new machine learning algorithms for diverse news recommendation. We plan to and deploy and test them in a large-scale experiment involving multiple news producers and consumers.

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