Pop: Bursting News Filter Bubbles on Twitter Through Diverse Exposure

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ABSTRACT

An increasing number of American adults are consuming news on social media platforms. However, these digital platforms employ personalized recommendation algorithms to increase user engagement. This selective exposure to information leads to the formation of filter bubbles where the users are constantly fed information in line with their ideological views. In this paper, we aim at bursting these filter bubbles through diverse exposure. We discuss the design of a Google Chrome extension, Pop, which augments user's Twitter feeds with news tweets from agencies of different ideological standings.

CCS CONCEPTS

• **Human-centered computing** → **Social networks**; **Social media**; Computer supported cooperative work;

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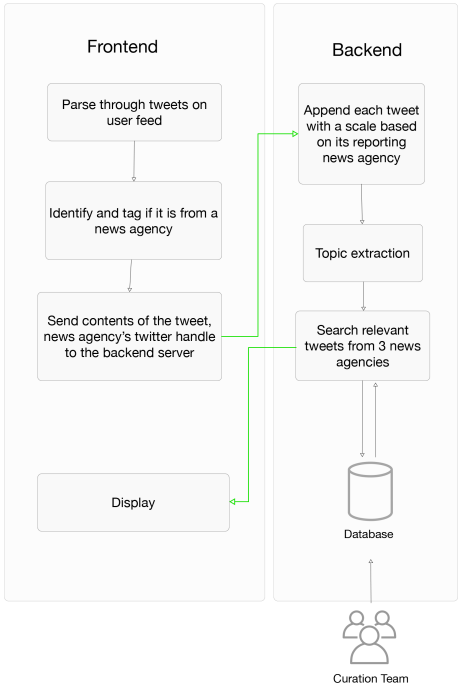

Figure 1: System architecture of Pop

KEYWORDS

filter bubbles, diverse exposure, media polarization, social media

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INTRODUCTION

Modern recommendation algorithms and personalized searches curate content to present what a certain user is more likely to engage with based on information about the user, such as location, past click-behavior and search history. As a result, users become separated from information that disagrees with their viewpoints, effectively isolating them in their own cultural or ideological bubbles. Eli Pariser coined the term filter bubbles to describe this phenomenon where users get less exposure to conflicting viewpoints and are isolated intellectually in their own information bubble [6].

There has been significant research on media polarization in the United States. According to a Pew Research Study [2], People with different political views in the United States seek and trust completely different news sources. The study looks at three different news consumption sources - social media, news media, and personal offline interactions. It finds that those with the most consistent ideological views on the left and right have information streams that are very distinct from each other. This polarization is also reflected in the online shared spaces and it could be augmented by filter bubbles. Bakshy et. al [3], analyzed how 10.1 million Facebook users in US interacted with socially shared news. They found that people encountered roughly 15% less cross-cutting news due to algorithmic ranking. This selective exposure correlated with higher levels of attitudinal polarization and greater fragmentation in issue priorities [5, 9, 10].

One of the strategies to burst a filter bubble is diverse exposure. This combats the selective exposure generated by recommendation systems by exposing the user to different viewpoints on the same issue. Munson used the concept of diverse exposure and created a browser extension that showed the ideological leaning of the news article being read. Experimental data suggested a more balanced news consumption over a control group [7].

RELATED WORK

There have been several attempts to reduce the effect of filter bubbles on news consumption through social media. Some solutions present different aggregated views of news reporting of the same topic side by side [4] and some others allow users from one ideological leaning to view social media feeds of

Figure 2: Pop as an embedded button with Twitter's default action list

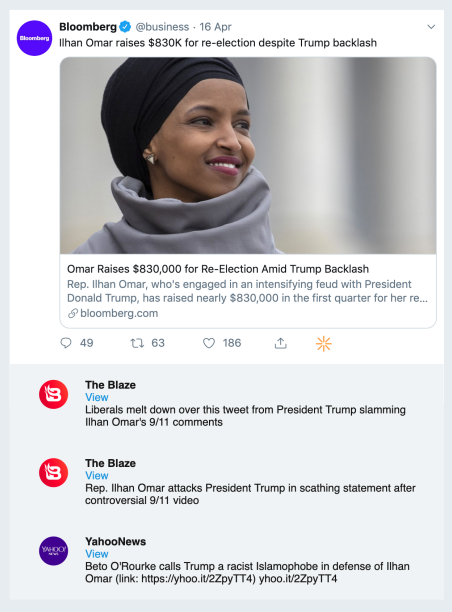

Figure 3: Displaying relevant tweets on user's feed

users with other ideological leanings [8]. These solutions aggregate news articles on a world level and are not personalized for the users. They are also presented in a different viewport/window and are not integrated into the social media systems which users are using as their news source. We leverage the personalized feed present on Twitter to expose users to diverse opinions on an individual level.

SYSTEM DESCRIPTION

Pop is a Google Chrome browser extension that aims to bring diverse perspectives by aggregating multiple news sources' coverage of the same event. To support diverse perspectives, we rely on the ideological placement chart published by Pew Research Center [1]. The chart positions different news reporting agencies on their audiences' ideological views ranging from consistently liberal to consistently conservative. Pop consolidates tweets from news sources that have different ideological values and displays them to the users within their Twitter feed thereby using the principle of diverse exposure to burst filter bubbles.

Pop embeds an action button into each news agency tweet on a user's Twitter feed (see Figure 2). Clicking this button fetches tweets about the same news event from other news agencies across the ideological spectrum (see Figure 3). The system relies on an editorial team to match the various news agencies tweets by news events (see Figure 1). Adding Pop to the tweets in the user's Twitter feed makes the system personalized and tailored for each user.

DESIGN DECISIONS

Picking news agencies on the ideological spectrum

Each news source on the ideological spectrum is given a score based on its location. Thus, Yahoo News! Is given a score of 1 and MS NBC is given a score of -2. When a user sees a tweet from a news agency on their Twitter feed, the system locates this news agency on the spectrum and identifies the score associated with the agency. It then picks three random news agencies on the other side of the spectrum. Thus, if the agency has a positive score, the system will pick three random agencies from the negative score.

Curation of tweets across news sources

The system is supported by an editorial team that matches tweets from various news agencies for the same news events. This was done to reduce algorithmic error and further biasing of the users. Having an editorial team also reduced the complexity of topic extraction and allowed for accurate matching of tweets by news events.

User Interface Design

- Integration into the social feed: Pop displays tweets within the Twitter feed. This enables users to view different viewpoints without leaving their source of news. This ensures an easy news consumption experience where the user can see all relevant information in a single space. Adding it to the user's Twitter feed also makes this solution personalized for each user.
- Unbiased presentation: In terms of visual presentation, we designed each added tweet to be visually similar to each other, thereby reducing bias. Furthermore, the ordering of the added tweets is randomized. This ensures that all news reporting agencies have equal importance.
- User Control: By making the activation of the system deliberate through users intended action i.e., clicking on an icon, we ensure that we do not force the importance of diverse perspectives but allow users to explore it freely and thereby make a conscious decision.

CONCLUSION

In this paper, we introduced Pop, a Google Chrome browser extension that runs on the Twitter feed to tackle the problem of filter bubbles for news consumption through social media. The system supports diverse exposure by presenting tweets about the same news event from news agencies on different sides of the ideological spectrum. For future work, we would like to analyze the effects of this system through a systematic user study. We would also like to extend this to have automated curation and increase scalability.

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