

OPIAS: Over-Personalization in Information Access Systems

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ABSTRACT

“Filter bubbles,” a phenomenon in which users become caught in an information space with low diversity, can have various negative effects. Several tools have been created to monitor the users’ actions to make them aware of their own filter bubbles, but these tools have disadvantages (e.g., infringement on privacy). We propose a standalone demo that does not require any personal data. It emulates Facebook, a well-known and popular social network. We demonstrate how each user interaction may affect the selection of subsequent posts, sometimes resulting in the creation of a ‘filter bubble.’ The administrator (researcher) can tailor the demo for any context, changing the topics and points of view used in the demo. Data collection via surveys before and after the demo is facilitated so that the demo can be used for research, in addition to education.

CCS CONCEPTS

- **Information systems** → **Search interfaces; Personalization;**
- **Human-centered computing** → **Interactive systems and tools.**

KEYWORDS

information filtering, overpersonalization

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1 INTRODUCTION

With approximately 1.7 billion active users,¹ Facebook is one of the biggest social networks in the world. Given the large userbase sharing huge amounts of content, user models and personalization algorithms become essential to lighten users’ cognitive burden and enhance their experience. Although proprietary, it is known that Facebook attempts to curate content in a manner that models trust and relevance.² However, this content optimization process has a feedback loop: the available content drives user interaction, while interaction drives content selection. [10] This loop can leave a very

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¹investor.fb.com/investor-events/event-details/2020/Facebook-Q4-2019-Earnings

²tinuiti.com/blog/paid-social/facebook-algorithm

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narrow selection of information sources and perspectives on social sites, resulting in what researchers have called ‘echo chambers,’ ‘balkanization,’ or most commonly, ‘filter bubbles’ (e.g. [8]).

Many users are unaware that such algorithms exist. [5, 9] Those who are somewhat aware of the algorithms each have their own theory on how they work. [10] In some cases, users think friends are actively hiding posts, showing that algorithmic curation on social media sites may have implications for relationships. [5] As the host of the content and the creators of the curation algorithms, social platforms are *gatekeepers*; their biases, human or technical, affect the information flow within society. [1] In fact, some researchers have described filter bubbles as “a serious threat to our democracies” [2], echoing previous findings describing how recommendation algorithms have been known to spread extremist content. [7]

Researchers have created tools to raise users’ awareness of their information behaviors; for instance, their news reading habits [6] and their search results [11], with the goal of inspiring a change of habits. Others have focused on social networks, creating tools to enable users to visualize and control which friends or topics are in their filter bubble on a platform. [4, 10] However, these tools are invasive, requiring access to personal data. Previously, we introduced an approach for raising awareness within various search engine scenarios (e.g., text and image search [3]) that does not require any personal data. In this work, we present a demo that imitates Facebook and demonstrates how user interactions affect the selection of subsequent posts, sometimes creating a ‘filter bubble.’ The demo can be tailored by context, topics and points of view discussed in the posts, for use in research or education/awareness.

2 DEMO WALKTHROUGH

Front end / User walkthrough. The **introduction page** provides information on the creators, the purpose, and the privacy policy of the demo, along with a consent form, required for initiating the demo. **Home page.** Landing on the replicated interface of Facebook, the user can scroll down the “home page.” The user will come across *two* informative posts shared by friends; *a link* explaining what *nuclear energy* is, and *an image* showing how many people get *vaccinated* every year. There are comments on each post, some in support of the subject matter and some against it; one person comments that it’s great so many people get vaccinated and are protected from illnesses (*supporting*), while another comments that people are getting poisoned every year by vaccines (*against*).

When the user ‘likes’ a comment on a post, the user model is updated with the ‘liked’ point of view and our recommendation algorithm chooses the next post accordingly. If the user ‘likes’ a comment against vaccinations, the next post is one expressing a negative view about vaccinations. The user sees *3 more posts* before the page stops scrolling with a button to load the Explanation page.

Research Questions. Admin may include a page with *questions* before and/or after the Home page, if the demo is used for research. **Explanation page.** The page displays each post that the user interacted with, and for each, how the user’s action (‘like’) affected the user model and how the next post on their feed was chosen. In the following section, we unveil the posts that were hidden from the user by the recommendation algorithm. These are the posts from the “opposite” point of view on that topic (*supporting vaccinations*) and all posts from the topics with which the user did not interact (*nuclear energy*). For each interaction, there is one post from the user’s topic and two from the hidden topic. By placing all posts side-by-side, we create a visual representation of their filter bubble. Finally, we provide further information on overpersonalization and basic tips for increased user control on social media.

Back end / Admin walkthrough. The admin can affect the user’s experience. First and foremost, the admin can choose the **topics** (nuclear energy, vaccination) that appear in the demo. The admin can hide/show, add, edit, or delete [*hereon: edit*] topics, as well as the **posts** within the topics and their respective **comments**. Each topic must have the same number of ‘positive’ and ‘negative’ (supporting, against) posts, which may be images or links. There must be two to five topics enabled simultaneously. The total number of posts seen by the user can be set to a number between 3 and 10.

The admin has the option to “**enforce extremism**” by hiding comments that disagree with a post. This disables the opportunity for the user to see the ‘opposite’ point of view and locks them into the view that they interacted with first. The admin may also toggle the ‘**clickable links**’ feature, (dis)allowing the link posts to lead to static pages. While creating a more realistic experience, this lengthens the demo, which may be undesirable in some contexts.

The admin, in many cases a researcher, may also edit a **research study** and the **questions** within it. The questions appear on a page before or after the demo’s Home page. The admin may download interaction data as well as answers to the research questions. Lastly, the admin may edit **accounts** that can access the admin panel, or edit/hide “dummy posts” meant to simulate a real social media feed.

3 CONCLUSION

This demo has an educational goal, specifically to make the general population aware of filter bubbles and their implications. As a side goal, questions may be added at two different points of the demo, and some interactions are recorded, facilitating research. As posts and comments may be fully edited, the demo can be tailored to discuss any topic and tailored to any educational audience or research field. Therefore, it can be used to research behavior or beliefs around specific topics, user perceptions of recommendation systems or social media, or user awareness of filter bubbles.

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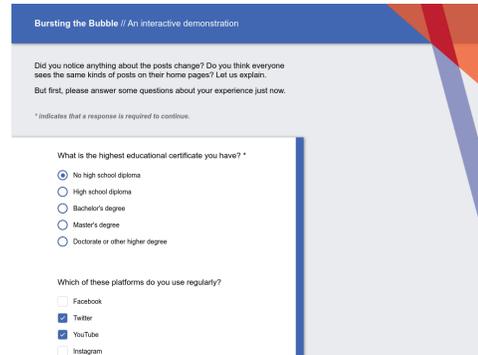


Figure 1: Research questions page.

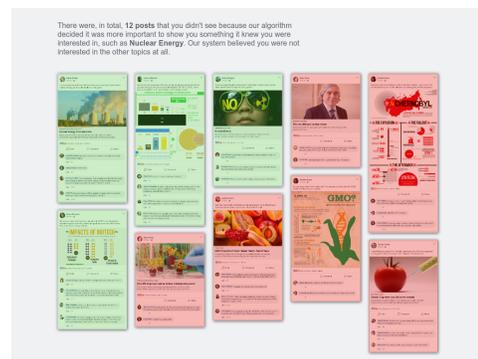


Figure 2: Visualization on the explanation page.

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