The Aftermath Of The Adpocalypse: Systemic Bias on YouTube

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ABSTRACT
Social media platforms are increasingly shaping political discourse by providing a platform for new generations of political commentators and serving as a primary means for the distribution of news. However, the business models of these platforms, largely driven by advertising, may be driving the introduction of bias both at systemic and personal cognitive levels. In this work, we briefly discuss how the YouTube Platform is potentially promoting bias through a combination of platform designs, policies, and recommendation algorithms. Finally, we discuss design ideas for augmenting the user experience of YouTube that may work to mitigate these biases.

CCS CONCEPTS
• Human-centered computing → Collaborative and social computing.

KEYWORDS
YouTube, adpocalypse, recommendation system, bias
INTRODUCTION

In recent years, social media platforms’ potential to shape online political discourse has come under more scrutiny [6, 18, 29]. Platforms have fostered an emergence of new political movements including both progressive and extreme right-wing voices and communities. At the same time, there has seemingly been an increase in the dissemination of misinformation or “fake news” through these platforms [3, 16, 30]. Both of these phenomena have forced tech companies to reevaluate the design and business models of their platforms in light of their potential implications for our democratic society. For example, Facebook has deployed new mechanisms for tagging fake news as disputed [4, 12]. They then worked to contextualize tagged articles by showing alternative related articles to give the users more context about the story [22]. However, the impact of these mechanisms are of yet unclear, but in some cases have backfired, further reinforcing user biases [4, 12, 27, 28].

We have become primarily interested in how these phenomena are playing out on the YouTube platform, where a new era of political discourse has begun. The platform is facilitating the emergence of a new generation of political commentators. The business model of YouTube, which enables the monetization of video content through advertising, has enabled many of these commentators to go from moonlighting amateurs to full-time professionals. However, since the 2016 United States elections and the accompanying scrutiny, YouTube has repeatedly updated their monetization and recommendation policies [2, 8].

In 2017, YouTube faced a boycott by some of their largest advertising clients, when it was found that ads for those clients were run alongside hateful and violent videos [8, 25, 26]. In response, YouTube reformed its advertiser-friendly content guidelines, and executed an extensive overhaul, which demonetized millions of videos and channels that purportedly violated the new guidelines. This policy shift became evident when YouTube creators began noticing a marked decrease in their earned revenue and recommendations of their videos [2, 10, 21, 23]. This event has colloquially become known as the “Adpocalypse”.

By the end of 2017, YouTube recovered as advertisers started to return. However, since then the platform has continued to implement new content policies in response to scrutiny. For example, YouTube has announced that they are working adjust their recommendation algorithms to elevate more "authoritative sources" [24] and crack down on more “borderline” content [1]. Predictably, many creators, including many of the emerging generation of political commentators, have reported that the recommendation algorithm no-longer recommends their videos to unsubscribed viewers while largely
promoting mainstream media outlets [11, 31]. These efforts by YouTube, are undeniably creating bias within the system through the application of automated monetization and recommendation algorithms to optimize the platform’s business model by promoting acceptable content and hiding “borderline content”.

Notably, the YouTube algorithms have no inherent civic responsibility. The algorithms interpret the rules of the platform and user interest models to create representations of reality for viewers based on variety of contextual factors, including both personal and systemic biases. With YouTube being the largest video watching platform in the world [17], this automated bias has the potential to have a significant impact on political discourse. Thus, we argue there is a need for tools that illuminate the biases of these platforms and provide means for users to exercise media literacy in these contexts.

In the following sections, we discuss how the business model of YouTube has driven updates in platform policies and algorithms that enable different forms of cognitive bias. Finally, we envision new design concepts for the YouTube search and viewing experience that may help lessen the impact of these biases.

**SYSTEMIC BIAS IN ADVERTISING FUNDED MEDIA**

In their seminal work “Manufacturing Consent”, Herman and Chomsky establish a theory of the influence of corporate ownership and the advertising economy on media bias [15]. They hypothesize that because most media outlets are funded by advertising, advertisers have an inherent ability to “license” what political and economic views are acceptable. They also argue that large profit driven media outlets must serve the interests of corporate owners and investors. This theory has been applied in many contexts to examine systemic bias in media [7, 9, 13, 14]. Given the advertising driven business models of most social media platforms, we can also assume that advertisers have significant influence over what content is monetized and promoted on these platforms. Further, with the advent of big data and deep learning technologies, these platforms now have the tools to implement these biases at scale.

**HOW YOUTUBE IS ENABLING BIAS**

In this section, we examine how the design of the YouTube platform and the policies it implements may be facilitating different forms of cognitive bias. In particular, we examine how the platform may be reinforcing confirmation and anchoring biases.

**Bias of Authoritative Sources Policy**

When responding to search queries related to the political topics, the YouTube search algorithm is highly preferential to content from authoritative sources, e.g., The Washington Post, NBC News, Fox News, etc. Figure 1 shows an example search result for impeachment taken on the day U.S. President
Donald Trump was acquitted by the Senate. We note this screenshot was taken from one of the authors’ YouTube accounts, which is subscribed to at least 15 alternative news and politics channels. Additionally, the recommendation algorithms that select videos to promote on users’ front pages and recommended videos tabs are increasingly promoting content from authoritative sources.

By favoring authoritative sources, YouTube promote the reporting, ideas, and narratives expressed by those outlets. This is facilitating anchoring bias, where people tend to utilize initial pieces of information encountered to frame their further thinking [33]. By exposing users first to authoritative sources when searching new topics or checking their recommended videos, that platform is establishing those sources as an anchor that frames future thinking.

**Confirmation Bias via Recommendations and Subscriptions**

On the YouTube front page and on video pages, YouTube recommends videos for users to watch. This content is likely to be content that users select to watch or that the “autoplay” feature of YouTube selects for users to watch. As noted previously, these algorithms are increasingly defaulting to authoritative sources. However, these videos often still appear to be selected based on the prior watching behavior and subscriptions of users.

While it is difficult to know precisely the behavior of the recommendation algorithm, it appears probable that recommended videos align with content users have already watched. This likely encourages confirmation bias by exposing users to content they may already agree with. In confirmation biases, people seek to support and increase the credibility of their views while avoiding supportive information of alternative hypothesis [19, 32]. However, if we imagine the opposite case where YouTube is not matching the users with their preferences, it will likely become frustrating for users. Additionally, the subscription model of YouTube enables viewers to easily return to their favorite channels, likely further enabling confirmation biases.

**HOW THE YOUTUBE BUSINESS MODEL DRIVES BIAS**

Given that YouTube’s revenue is largely driven by advertising, which brought in more than $15 billion in 2019 [20], we can assume that it weighs heavily on policy and design choices for the platform. As we noted in the introduction, advertisers desires for their ads to run on non-controversial content has led to a number of changes. This includes the policies that favor political content from authoritative sources.

However, the platform’s reliance on advertising revenue also necessitates designing to maximize the amount of time watched, thus maximizing the number of ads seen. This leads to the design of recommendation algorithms that select content that viewers will be more inclined to watch [5]. That content may be more likely to be controversial or to reinforce the already held views of the viewer.
Figure 2: Proposed YouTube Search Page. Search results are presented in three lists to help people compare and contrast videos to watch. The lists provide search results from different types of video channels. For example, authoritative sources such as ABC news may provide more high-production coverage of political events. However, these sources likely have a underlying established political perspective. To encourage user awareness of alternative viewpoints, we can include search results from alternative perspectives such as independent and controversial political commentators.

Additionally, subscription models may drive up watch time by help viewers identify content they want to watch, but again may reinforce cognitive biases.

**POTENTIAL WAYS TO MITIGATE BIAS IN YOUTUBE**

In this section, we discuss potential ways to mitigate how YouTube promotes cognitive biases by conceptualizing potential augmentations to the YouTube platform. Through each one of these ways, we aim to promote users’ awareness of their own biases, that may be previously reinforced by the system, and alternative ideas while maintaining the YouTube business model. In the following, we present the design and motivations of these potential ways.

**Highlight Alternative Perspectives in YouTube Search**

Viewers use the YouTube search algorithm to help them locate videos of interest within the corpus of available YouTube videos. Figure 1 illustrates how the search results are presented as one list of homogeneous results. When users start watching a video from this list of results, they are effectively in an information environment created by the YouTube recommendation algorithm, which as we have seen is designed to keep users watching for long hours by recommending relevant videos.

We propose augmenting the search results to highlight alternative viewpoints. For example, as shown in Figure 2 we show results from different types of sources, such as authoritative outlets, independent commentators, and controversial political commentators. We note that algorithms for identifying these nuanced characteristics of channels would be non-trivial, but assume here that
they could be created. Additionally, the recommendation algorithms and autoplay features could be modified to also present users with content from alternative sources. The goal of this design is to increase the diversity of information that is produced from a search query and to enable users to compare ideas, framing, and narrative across a variety of sources. These alternatives will help users reason inductively about the search results and build a deeper understanding of the topic of their search query.

Helping Viewers Reflect on Personal and Platform Biases

To help viewers be more aware of their own biases and those promoted by the YouTube platform, we propose tools for helping viewers reflect on their own watch behavior. First, we imagine analytics tools for helping viewers explore their watch history. While the YouTube platform provides a rich set of analytics tools for creators to understand how their content is being received by audiences, there are virtually no analytics tools for viewers. We can imagine viewers benefiting from being able to see how much of their watch history was determined by the platform’s autoplay feature, is focused on particular topics, or is distributed between authoritative or controversial sources. By enabling viewers to easily see data regarding their own behavior, we expect that we can support them in starting to understand their own biases as well as those reinforced by the platform.

Tools such as these could also be automatically invoked by the platform. For example, if a user has been watching an automatically selected set of videos for several hours, the platform could notify them of this and invite the viewer to reflect on the watching history.

CONCLUSION

Social media platforms are increasingly becoming influential venues for political discourse. In this work, we described how the business model of one such platform, YouTube, is potentially resulting in policies and algorithms that introduce systemic bias and enable individual cognitive biases. It is important for us to clearly understand these phenomena if we want to design social media technologies to promote media literacy and an informed democratic society. We briefly discuss design concepts, including highlighting alternative perspectives and tools for support viewer reflection, that could be developed to augment the user experience of YouTube to mitigate these biases. Much work still needs to be done to further understand these phenomena and evaluate designs for mitigating bias.

REFERENCES


