Design Proposal for Reducing Bias in Recommender Systems

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Executive Summary

Social media recommender systems often show users content that is similar to what they already watch, like, or interact with in some way. This typically creates a loop where users keep seeing the same viewpoints, topics, and opinions without being exposed to content that is different from their typical feed. This problem matters because it can limit people's understanding of important topics, make misinformation more believable, and give platforms complete control over what content users absorb. The main audience for this issue is younger social media users, although anyone across any sort of recommender system based platform is affected by this issue. My proposed solution is called Perspective Balance. It is a feature that can be added to any social media app (or recommender system in general) to detect when a user's feed is becoming repetitive and occasionally add content that gives different viewpoints, creators, topic angles, or sources than they'd typically see. The goal is not to remove personalization but to make it more transparent, fair, and human centered. This way recommenders will be more dynamic and push diverse content to users' feeds.

Introduction

Social media platforms rely heavily on recommender systems to decide what content users see. These systems are used on platforms such as TikTok, Instagram, YouTube, and other apps where users scroll through personalized feeds. Recommender systems can be useful because they help users find content that matches their interests without having to search for it manually. However these systems can also create problems when they repeatedly recommend similar content based on a user's past behaviour.

The problem I focused on is bias in social media recommender systems. Many recommendation algorithms are designed to predict what users are most likely to watch, like, comment on, or share. If a user interacts with a certain type of content , the platform may continue showing more of that same content because it believes the user wants more of that content. Over time this can make a user's feed more narrow and repetitive. Instead of seeing a wide variety of viewpoints and topics the users see mainly content that confirms what they already believe or enjoy.

This issue is important because social media can shape how people understand the world. Many users get information about the news, politics, culture, lifestyle, and social issues through social media feeds. If the platform mainly shows one side of an issue the user may not realize there are other perspectives. This leads to echo chambers where users are just surrounded by information that reinforces their existing opinions. This also makes misinformation easier to believe because users will continue to see the same claim over and over without being exposed to corrections or different viewpoints.

The main target audience for this design is younger social media users. Younger people may be especially affected because they are still forming many of their opinions and spend more time on social media on average than others. This problem can affect anyone who uses recommendation based platforms though. People who mostly scroll instead of searching information are especially affected because the platform's algorithms choose exactly what content that specific user will see when scrolling.

Research Foundations

Interviews

I interviewed two classmates, Saad and Choudhry, both often use social media, with some differences in preferred platform, and both also have backgrounds in recommender systems. Even on different apps they both noticed their feeds are often repetitive. This supports my original concern about social media algorithms often showing users similar content over and over again.

One major insight from the interviews was that both users usually scroll through their feeds instead of searching for specific topics. This matters because it means the recommender system has control over what they see. If a user is not actively searching for different information then the platform decides what content gets placed in front of them. This makes the design of the algorithm very important because it can shape what users learn, believe, and pay attention to.

The interviews also showed that users do not necessarily want personalization removed completely. Choudhry said sometimes he likes how repetitive his feed is because it's content he already enjoys. Saad said he sometimes wishes the feed would change more and show him something different. Both of them agreed that social media can shape peoples peoples opinions. This showed me that the solution should not simply remove recommendation algorithms. Instead, the solution should keep the useful parts of personalization while adding more diversity, transparency, and user control.

Secondary Research

My secondary research also supported the problem I identified. The article by Yalcin and Bilge discusses unfairness and popularity bias in recommender systems. This connects to my idea because recommender systems may repeatedly promote content already popular or similar to what users have already seen. As a result less common viewpoints, smaller creators, or different perspectives may be shown less often.

The Search Engine Journal article on biases in search and recommender systems also connects to my topic because it explains that recommendation systems are not neutral. They make decisions about what information should appear first, what should be promoted, and what should be hidden or pushed down. Users may not always realize that their feed is being filtered in this way.

The sources from Milvus and Meegle discuss ethical challenges in recommender systems, including fairness, transparency, privacy, user manipulation, and avoiding harm. These concerns helped shape my final design. A recommender system should not focus on engagement. It should also consider whether the user is being treated fairly, whether the user understands why content is being shown, and whether the system is helping or harming the user.

Design Ideation

When thinking about possible solutions, I considered a few different ideas. One idea was an entirely new social media app that only showed balanced viewpoints. However this wasn't very realistic because most users are already committed to major platforms like TikTok, Instagram, and YouTube. A new app would struggle to gain enough traction to make a difference.

Another idea was letting users completely turn off recommendation algorithms. This would give users more control, but it would remove one of the main reasons people enjoy social media. Based on the

interviews personalized recommendations are something users still enjoy. Users don't want the algorithm gone, they'd just appreciate it branching out sometimes.

The final idea is Perspective Balance. This would be a modification that can be used by existing social media apps. It will keep the normal recommendations but also recognize repetitiveness and branch out every once in a while.

Proposed Technology Concept

Technology Overview

Perspective balance is a feature that could be added to social media platforms to reduce repetitiveness. The feature would detect when a users feed is becoming too narrow and occasionally add content that is still related to the users interests but different from what they usually see. They could be called branch out posts.

The goal of Perspective Balance is not to force users to watch content they don't like but to give users opportunities to see the other side of many topics or see new topics. This will make peoples' feed much more balanced.

How it Works

Perspective Balance would work by studying the users normal feed behaviour. Like current social media algorithms, it looks at what the user watches, likes, skips, comments on, and shares. The system will look for patterns in the feed.

If the system detects a feed is very repetitive then it would add in a branch out post. The post would still be connected to the users interests but includes some kind of difference to branch the users feed a bit. For example if someone is tracking a political issue often the branch out might be about the same issue but the other viewpoint. That post may have a short explanation for why it appeared, “Contains a different viewpoint on a topic you view often” could be an example.

Ethical and Human centered Design Considerations

Fairness

Perspective balance addresses fairness by helping users see more than just repetitive content. Current recommenders favor popular posts, familiar viewpoints, and creators the user already watches. This makes feeds feel personalized but can make the experience narrow. My design helps keep personalization while also branching users feeds out to make the experience less narrow.

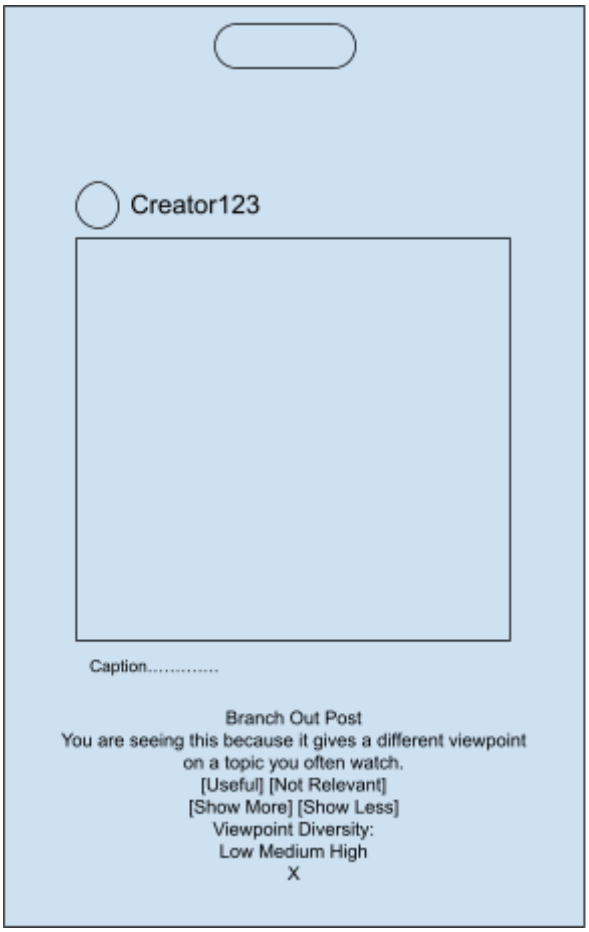
Transparency

The design also focuses on transparency. Many users are unaware why certain posts are in their feed. Perspective balance adds explanations to help users better understand why they are seeing certain posts in their feed.

Avoiding Harm

Another concern is avoiding harm. The system should not recommend hateful, extreme, or false content just because it's different. The goal is variety not misinformation. This feature could come with safety filters to prevent this.

Visual Prototype



My visual prototype shows a phone screen with a social media post labeled “Branch Out Post”. The post includes a short explanation of why they are seeing it. It also has feedback buttons so the user can mark it as useful or not, if they want to see more or not, and a value of how diverse the post is in comparison to typical feed.

Implementation Pathway

To build Perspective balance, the platform would first need to identify the topic, source, creator, and general viewpoint of posts. Then with this they would need to verify if a user's feed is getting too repetitive. If it is, the app would then push a branch out post that is still related to the users interests. These posts would have to still be helpful and not random or annoying.

Conclusion

Perspective balance helps reduce bias in recommender systems by giving users more variety, transparency, and control. It connects well with the interviews to give users the features they care about most. This feature will not only focus on engagement like existing algorithms but also help users view different ideas.

References

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