
FeedVis: A Path for Exploring News Feed Curation Algorithms

Motahhare Eslami

University of Illinois at Urbana-Champaign
201 N. Goodwin Ave.
Urbana, IL 61801 USA
eslamim2@illinois.edu

Amirhossein Aleyasen

University of Illinois at Urbana-Champaign
201 N. Goodwin Ave.
Urbana, IL 61801 USA
aleyase2@illinois.edu

Karrie Karahalios

University of Illinois at Urbana-Champaign
201 N. Goodwin Ave.
Urbana, IL 61801 USA
kkarahal@illinois.edu

Kevin Hamilton

Center for People and Infrastructures
University of Illinois, Urbana-Champaign
1308 W Main Street
Urbana, IL 61801-2307
kham@uiuc.edu

Christian Sandvig

University of Michigan
Room 5385 North Quad
105 South State Street
Ann Arbor, MI 48109-1285
csandvig@umich.edu

Permission to make digital or hard copies of part or all of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. Copyrights for third-party components of this work must be honored. For all other uses, contact the Owner/Author.
Copyright is held by the owner/author(s).
CSCW '15 Companion, Mar 14-18 2015, Vancouver, BC, Canada
ACM 978-1-4503-2946-0/15/03.
<http://dx.doi.org/10.1145/2685553.2702690>

Abstract

Social media feeds, personalized search results and recommendations are examples of algorithmically curated content in our daily digital life. While the algorithms that curated this content have great power to shape users' experiences, they are mostly hidden behind the interface, leaving users unaware of their presence. Whether it is helpful to give users knowledge of the algorithms' existence and if this knowledge affects interaction behavior are open questions. To assist us in addressing these questions, we developed a system, *FeedVis*, that exposes Facebook users to comparisons between algorithmically curated and unadulterated News Feeds. We used the tools visualizations as concrete artifacts to study users' perceptions of the algorithms governing their social media feeds.

Author Keywords

Algorithms; Invisible Processes; News Feeds

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous

Introduction

Algorithms curate everyday online content through information prioritization, classification, association,

and filtering approaches [1]. Yet, many of these algorithms reside behind the walls of human perception and intellectual property, resulting in a lack of knowledge or their existence and use. While this invisibility is often cited as a byproduct of good design, in the world of social media, it is resulting in incomplete models of online behavior and relationships. For instance, Merrie Morris, explored an assumption that new mothers post extensively about their babies on Facebook and found instead that this perception is highly exaggerated due Facebook News Feed's prioritization of posts with more likes and comments — photos of babies often receive attention from a large audience. This lack of users' knowledge about this prioritization algorithm resulted in misperceptions of new mothers' activities in social media. Some went so far as to block the new mothers thinking not knowing the algorithm was making these decisions [2].

Given the prevalence of Feed curation algorithms and their power to shape behavior dynamics, should users be knowledgeable about their existence and operation? To answer this question, we explored users' awareness and perception of the Facebook News Feed curation algorithm, hereafter "the algorithm". To do so, we built a Facebook application, *FeedVis*, which discloses what we call "**the algorithm outputs**": the differences in users' News Feeds when they have been curated by the algorithm and when they have not. Through *FeedVis*, a Facebook user is able to explore the stories (e.g. status updates, pictures, videos, likes, and comments) of their followed friends and pages that were hidden by the algorithm.

We have used this tool for a relatively small probability sample of Facebook users [3] to understand their level of awareness of the algorithm's existence and their

reactions their News Feeds' curation. Our participants discussed their thought process for up to three hours revealing personal theories of the algorithmic process and rather surprising reactions to the algorithm reveal. We believe demonstrating our tool to a larger number of users in CSCW would provide us with greater and more diverse feedback to interrogate our research method and design ideas and to explore the concept of algorithm education.

FeedVis

Our first task with *FeedVis* was to contrast the stories that appeared on a user's personal News Feed with the full possible feed created by their network of friends. We used Facebook's API v.1 to extract the user's News Feed Stories. Then, we created an "all stories" feed by taking the union of all stories contributed by the user's Facebook friends. To illustrate, this all stories feed is the collection of all the stories that would be visible to the user if read the stories directly on the friends' pages. The user's News Feed is, therefore, a subset of the "all stories" feed.

If a story appeared on the user's News Feed, we labeled it "shown". If it appeared in the all stories feed and not on the News Feed, we labeled it "hidden". Since extracting all friends' stories takes time, we limited the collection period to one week or less. The exact number of days depended on the number of user's friends— larger friendship network requires more time to extract the story data. Using this data, we designed four *FeedVis* views to probe the users' News Feed.

The Content View: Revealing Content Filtering

In the first view, our goal was to compare an unfiltered and a filtered feed. Figure 1 shows the first view of FeedVis, *Content View*. It consists of two columns: The right column, displays the “Shown Stories” (i.e. the stories that appeared on the user’s News Feed). The left “All Stories” column, displays every story posted by the user’s friend network. We distinguish between shown and hidden stories in the “All Stories” column by color. Shown stories appear in both columns with a blue background; hidden stories appear only in the “All Stories” column as holes in News Feed with a white background. By scrolling through this view, a Facebook user is able to compare what she saw in her Feed and what she would have seen in the absence of the algorithm. For those who were not aware of the algorithm’s existence, this view was the first big revelation.

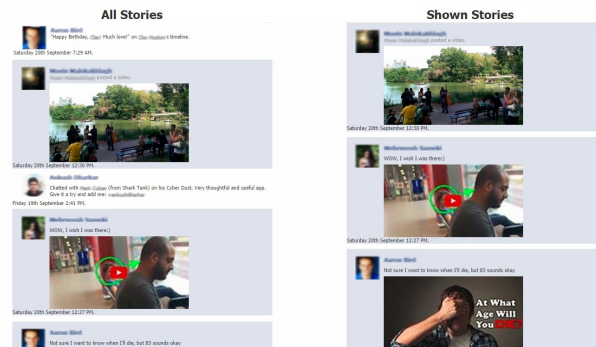


Figure 1. The Content View: shown stories occur in both columns (in blue background), while hidden stories appear only in “All Stories” column in white background.

The Friend View: Revealing Social Patterns

We provided another view, the *Friend View*, (Figure 2), to reveal social patterns by helping the user understand the frequency with which a friend’s stories appeared in her News Feed. The first category, “rarely seen”, includes friends who had less than 10% of their stories shown to the user. The second category, “sometimes seen”, includes friends who had approximately 50% of their stories shown to the user. Finally, the third category, “mostly seen”, includes friends whose stories were almost never filtered out for the user. The number of the shown and hidden stories is displayed above and below the x-axis, respectively. An “expand list” button on the lower right allows the user to explore additional friends and see where they belong across the three categories.

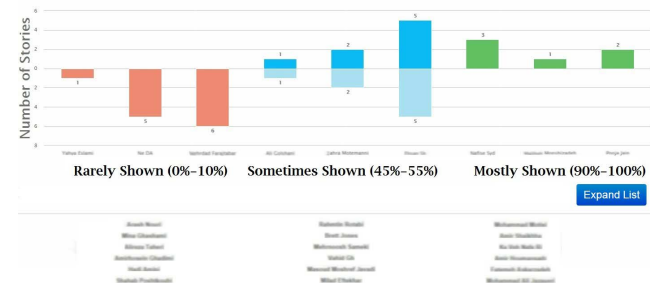


Figure 2. The Friend View: This view divided the user’s friends into three categories based on the proportion of each friend’s stories that had appeared in the user’s News Feed.

After the user explored the algorithmic outcomes, we presented her with two additional views that invited her to tweak the algorithmic outputs as she wished. These views are described in the following sections.

The Friend Rearrangement View: Envisioning a Different Friend View

In this view, we presented the user with three lists of friends, one list for each of the labels in the *Friend View*. We then invited the user to reassign friends to the category they felt the friends should belong (Figure

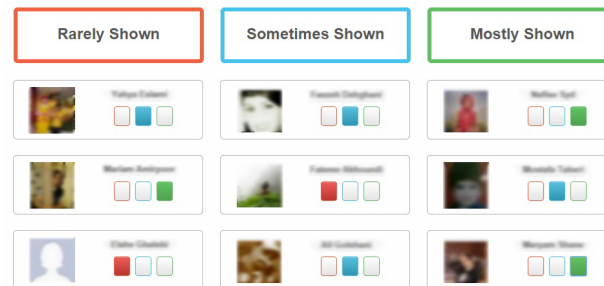


Figure 3. The Friend Rearrangement View: User can move friends between the categories by changing the color of a friend to the destination category's color.

The Content Rearrangement View: Envisioning a Different Content View

Analogous to the *Friend Rearrangement View*, in the *Content Rearrangement View* the user declares which specific shown stories they did not want to see and which hidden stories they did want to see. Because many Facebook users have thousands of posts over a week, exploring all the stories could be burdensome. Therefore, we selected ten stories in the shown column and ten stories in the hidden column randomly to populate this view (Figure 4).

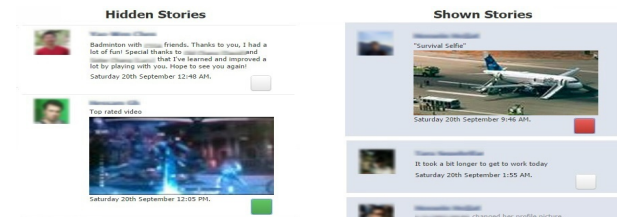


Figure 4. The Content Rearrangement View: User can move stories between shown and hidden categories.

Demo Goals and Conclusion

We have two main goals in demonstrating FeedVis at CSCW. The first goal is to receive feedback and collect data from a larger pool of Facebook users. We want to expand our existing work to explore levels of algorithm awareness. Second, we want to allow CSCW attendees to experience FeedVis and engage with their own data in the conference. We believe the engagement offered by FeedVis and similar social algorithm probes will enhance algorithm knowledge surrounding News Feed curation and its effects on social media experience.

Acknowledgements

This work was funded in part by the Office for the Vice Chancellor of Research Interdisciplinary Innovation Initiative at the University of Illinois.

References

- [1] Diakopoulos, N. Algorithmic Accountability Reporting: On the Investigation of Black Boxes. Tow Center for Digital Journalism (2014).
- [2] Morris, M. R. Social networking site use by mothers of young children. In Proc. CSCW 2014, ACM Press
- [3] Eslami, M., Rickman, A., Vaccaro, K., Aleyasen, A., Young, A., Karahalios, K., Hamilton, K. and Sandvig, . I always assumed that I wasn't really that close to [her]: Reasoning about invisible algorithms in the news feed, CHI 2015.