Students’ growing concern with surveillance capitalism

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Part 1 – Recommender Research

• With funding from the University of Illinois Campus Research Board (2015-2018), researchers developed a personalized account-based recommender within the university library’s mobile app interface.

• The recommender system (RS) is derived from data mining of item topic clusters checked out together in the university library.
  • Incorporated into library mobile app
  • VuFind Privacy Policy Developed

• Student interviews throughout the 2018 academic year.
Motivations

• Discovery systems in libraries hold vast stores of user data that have not been processed with machine learning and data mining for personalized “my-account” based recommendation purposes.

• Previous work in location-based recommendations in library books stacks that included student interview and observation (Hahn, Ryckman, Lux, 2015) led researchers to re-focus development into an account-based recommender.
  • Related research and development work at the University of Illinois Library looked at incorporating circulation data in relevancy rankings for search algorithms (Green, Hess, Hislop, 2012).

• For the account-based recommender: a data stream of subject metadata clusters that are checked out together was developed.
Mobile Account-Based Recommendations

• Goals:
  • A prototype software framework and foundations of an algorithm for library systems was a necessary first step.
    • Proof of concept recommendation middleware was developed to provide basic personalized recommendations for research library users using VuFind accounts.
    • Provide the option of mobile account-based recommenders when users login to their VuFind account.
Mobile Account-Based Recommendations

• Data Process
  • Gather streams of topic clusters checked out together
  • Use offline Machine Learning Process.
    • Development of an association rule database by way of the FP-growth algorithm (e.g. Han, et al., 2007).
  • Store association rules in a recommender database for lookup in app middleware. Business logic in the system uses VuFind filters at runtime (e.g. when recommendations are requested by user).
Recommender Service Privacy Policy for Library VuFind Accounts

BACKGROUND/PURPOSE

The Recommender Service Privacy Policy for Library VuFind Accounts is a document to support machine learning processes for service delivery in the Library. The research and development of a library account based recommender utilizing machine learning was funded by the University of Illinois Campus Research Board in October 2015. The purpose of this policy is to provide documentation of the machine learning processes which leverages user account data. There are several data points utilized if the user logs-in to the recommender service, these include VuFind account information including VuFind favorites, VuFind renewals, VuFind item requests, and the users currently checked out items; researchers pair these data points with anonymized clusters of items that are checked out together. The experimental service will use VuFind checkout data along with other anonymized Voyager user data, specifically clusters of items that are checked out together, to provide recommended resources based on items in their account. The system will initially provide recommendations to other print and loanable technology items. This policy exists so that users who log-in to the recommendation service from VuFind accounts will be aware of the type of data we collect, preserve, and use from their VuFind account. For the purposes of this document the VuFind account is the user's library account accessed from the following interfaces: Minerva for Android, Minerva for iOS, and the VuFind login link from University Library Webpages.

https://sif.library.illinois.edu/prototyping/RecPrivacyPolicy.html
User Interviews

Using the library’s mobile recommender system as a prompt to understand student preferences for personalized account-based recommender systems, structured interviews were undertaken and analyzed thematically to determine RS features and functionality desired.
Policy Findings from user studies (Hahn, 2019) indicated:

• Student interviews indicated a need for crafting recommender services in library settings with transparent functionality; that would make clear how recommendations are designed and provided.

• A desire to use recommender systems to explore interdisciplinary research domains that have otherwise not been considered.
Students also indicated that they did not like the fact that commerce seems to drive recommenders, for example, “...on the Internet you might be interested in finding information about something but not want to buy.”
One student referred to YouTube as an example of a personalized recommender service that did not work the way she wanted it to, and noted that “...frequently YouTube doesn’t work so good because it gives you a recommendation based on one thing you did.”

“Recommendations are sending you things you already are interested in, which might not show you newer things and that is not really a good way to learn.”
“Sometimes it is scary. For example, you may be browsing the web and something follows you that you searched for on your phone. That something followed you. The algorithm is listening to you.”
Sometimes recommenders feel predatory

“...when they are trying to sell something it feels predatory...”
Surveillance Capitalism

Zuboff, 2019a, p9

Sur-veil-lance Cap-i-tal-ism, n.

1. A new economic order that claims human experience as free raw material for hidden commercial practices of extraction, prediction, and sales; 2. A parasitic economic logic in which the production of goods and services is subordinated to a new global architecture of behavioral modification; 3. A rogue mutation of capitalism marked by concentrations of wealth, knowledge, and power unprecedented in human history; 4. The foundational framework of a surveillance economy; 5. As significant a threat to human nature in the twenty-first century as industrial capitalism was to the natural world in the nineteenth and twentieth; 6. The origin of a new instrumentarian power that asserts dominance over society and presents startling challenges to market democracy; 7. A movement that aims to impose a new collective order based on total certainty; 8. An expropriation of critical human rights that is best understood as a coup from above: an overthrow of the people’s sovereignty.
Defining Surveillance Capitalism

Shoshana Zuboff in *Surveillance Capitalism and the Challenge of Collective Action* writes – “… was not an exchange with users but rather with companies who understood how to make money from bets on users’ future behavior” (Zuboff, 2019b, p 13.)
Behavioral Value Reinvestment Cycle

In this cycle, only behavioral data needed for service improvements are rendered. These are reinvested in the user experience.
The Discovery of Behavioral Surplus
Defining Surveillance Capitalism

Surveillance capitalism commandeered the wonders of the digital world to meet our needs for effective life, promising the magic of unlimited information and a thousand ways to anticipate our needs and ease the complexities of our harried lives.

Under this new regime, the precise moment our needs our met is also the precise moment at which our lives are plundered for behavioral data, and all for the sake of others’ gain.

Zuboff, 2019a, p53
Personalized recommenders from commercial entities are a quintessential attribute of surveillance capitalism.

Shoshana Zuboff’s critique of personalization as prediction imperative notes “...this new form of information capitalism aims to predict and modify human behavior as a means to produce revenue and market control” (2015).
Academic library recommenders can distinguish themselves from commercial recommenders in several ways, including increased transparency beyond what is available in commercial systems, and by attending to the level of student privacy desired as a system design* issue.

* “system design” necessarily presupposes ownership by libraries as a means to protect data in service of discovery. E.g. open-source tools.
Part 3 – Discussion Prompts

Are libraries poised to wrest behavioral data from the capitalist surveillance spheres of influence in the library marketplace in order to obtain recommender systems that deliver on their promise of interdisciplinary support? Other systems to support next generation scholarship?

Are there still possibilities to introduce (or re-introduce) the choice to opt-out from sharing behavioral data?

• 2007. Han, Jiawei, Hong Cheng, Dong Xin, Xifeng Yan. Frequent pattern mining: current status and future directions. *Data Mining Knowledge Discovery, no. 15 pp. 55-86*. [https://doi.org/10.1007/s10618-006-0059-1](https://doi.org/10.1007/s10618-006-0059-1)
Cited


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Consulted

Project Links

- https://minrvaproject.org/modules_recommendations.php

- https://sif.library.illinois.edu/prototyping/RecPrivacyPolicy.html