

Ethical Recommenders in the Public Library sector

Savvina Daniil

s.daniil@cwi.nl

Centrum Wiskunde & Informatica

Amsterdam, The Netherlands

ABSTRACT

Recommender Systems as an algorithmic class hide lurking risks despite their prevalence in academic and commercial circles. My specific research revolves around tracking and mitigating potential risks specifically in the Public Library domain. In collaboration with the National Library of The Netherlands, I am working on investigating whether the incorporation of Recommenders in a library's loaning system serves their social responsibility and purpose, with securing inclusivity being the main point of interest.

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1 INTRODUCTION

Recommender Systems are a class of algorithms that Internet users interact with on a daily basis and have proven to be very efficient. However, it is clear from research on their ethics that one should closely examine the potential risks of applying them in order to benefit from their value [3].

Accordingly, the National Library of the Netherlands (henceforth called "the library") has come up with seven principles that AI operations in their online system must adhere to [5]. My research currently focuses on investigating characteristics of Recommender Systems that potentially disobey them. In particular, I am inspecting the inclusivity aspect which relates to algorithmic fairness.

2 RESEARCH DESIGN

In their published AI principles, the library acknowledges AI's susceptibility to bias and equates maintaining inclusivity to knowing "... where and to what extent bias occurs [in the data], so that it can be eliminated or compensated." [5]. Therefore, it is relevant to investigate what kind of bias in the data can harm inclusivity "... towards age, ethnicity, religion, gender identity, sexual orientation, origin and political preference.". Hence, my first study focuses on how the distribution of different sensitive dimensions of an author's persona is affected by the recommendation process, potentially due to the issue of popularity bias that often arises.

By combining the concepts of discrimination and popularity bias, I will answer the following research questions:

- (1) Do commonly used algorithms propagate data bias towards sensitive author characteristics?
- (2) What is the relation between author characteristics bias and popularity bias?

As a first step, I reproduced three papers on the Unfairness of Popularity Bias in movie, music and book recommendation [1, 2, 4]. I am currently working on building on these papers from the perspective of propagation of bias towards sensitive author characteristics. In order to validate my research design, I selected Book-Crossing [6], a very popular dataset for book recommendations, and used additional sources (Google Books, VIAF and WikiData) to enrich it with additional information on the author when publicly available (e.g., gender, nationality, age). Concurrently, I am conducting research on diversity measures that have been used in Recommenders Systems studies, which I will adapt to the characteristics of my study.

3 FUTURE WORK

The question of what inclusivity in book recommendation is is not negligible. My first study focuses on authors, but other dimensions of the problem can be important depending on the context and thus should be given attention. For future work, I plan to consider book themes and users as well. I would be eager to receive feedback from the Ethical AI community on how to approach such task.

Finally, a next step ahead could be to crowdsource the task of data enrichment and compare my approach to the result. That way I could validate and improve my pipeline for future use on different datasets. At the same time, assigning this task to individuals could also introduce biases that are relevant to investigate.

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