Who Pays? Personalization, Bossiness and the Cost of Fairness

2022 FAcctRec Workshop

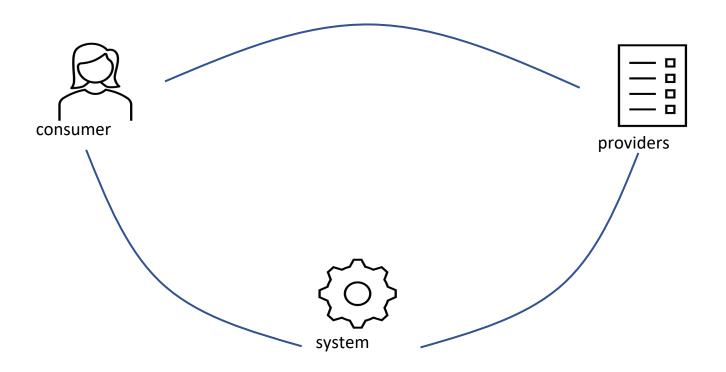
Authors:

Paresha Farastu, Nicholas Mattei, Robin Burke (CU Boulder) (Tulane) (CU Boulder)

Presenter:

Amanda Aird (CU Boulder)

In this paper, we look at the question of consumer-side unfairness arising as a consequence of provider-side fairness constraints

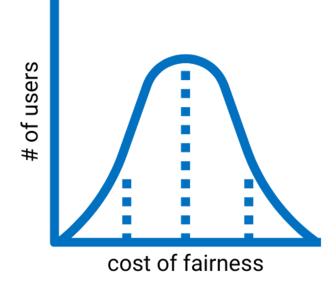


Cost of fairness [1]:

Background

users receive lower utility than they would in a system that is unconstrained by fairness objectives

What is the distribution of this cost?



[1]Sam Corbett-Davies, Emma Pierson, Avi Feller, Sharad Goel, and Aziz Huq. 2017. Algorithmic Decision Making and the Cost of Fairness. In Proceedings of the 23rd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, Halifax, NS, Canada, August 13 - 17, 2017 ACM, 797–806.

Context

Approaches

Further Research

Bossiness [2]

- o concept from social choice
- users manipulate their input in a way that harms others without getting worse outcomes themselves
- Recommendation Context
 - o the user's input is their user profile

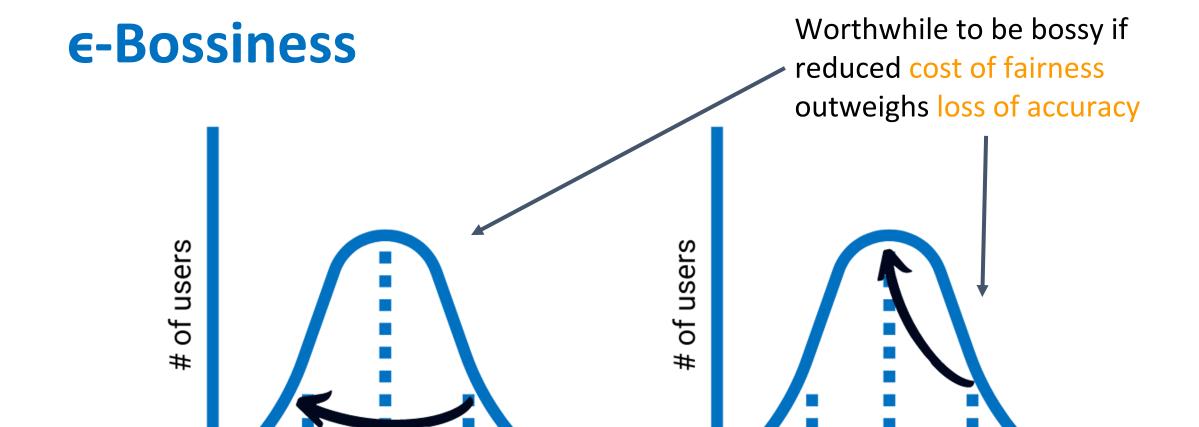
cost of fairness

Context

Approaches

model accuracy

Further Research



- We want to consider this in the long-term aggregate fairness context
- Example: Microlending application with Kiva
- Refer to [3] for more details

[3] Robin Burke, Nicholas Mattei, Vladislav Grozin, Amy Voida, and Nasim Sonboli. 2022. Multi-agent Social Choice for Dynamic Fairness-aware Recommendation. In Adjunct Proceedings of the 30th ACM Conference on User Modeling, Adaptation and Personalization. 234–244



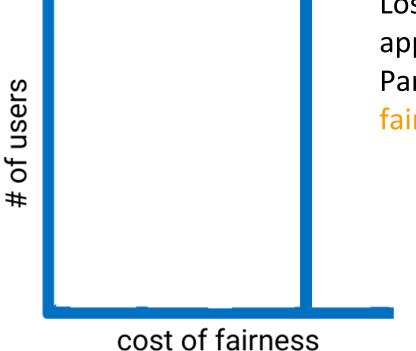
Context

Approaches

Further Research

Drop Personalized Approach to Fairness

Lower accuracy / utility for users

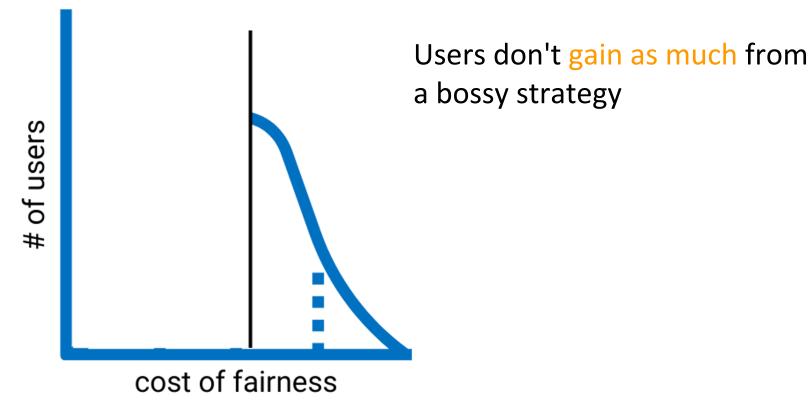


Loses the benefit of a personalized approach to fairness.

Particularly a problem for multiple fairness dimensions.

Minimum Fairness Requirement [4]

Require some "cost of fairness" for all users



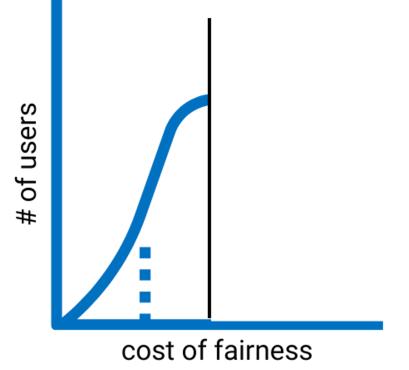
Context

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Maximum Cost of Fairness [5]

Prevent any given user from taking on much of the cost



No user has too much cost so less incentive for bossiness. Burden can't be shifted too much because of the upper bound.

[5] Gourab K Patro, Arpita Biswas, Niloy Ganguly, Krishna P Gummadi, and Abhijnan Chakraborty. 2020. FairRec: Two-Sided Fairness for Personalized Recommendations in Two-Sided Platforms. In Proceedings of The Web Conference 2020. ACM, New York, 1194–1204.

Context

Approaches

Further Research

Study system vulnerabilities to bossy strategies and possible responses

- In the Kiva context, which might be more effective:
 - o upper bound on the cost of fairness?
 - o lower bound?
- Can we persuade users not to be bossy?

Thank you

amanda.aird@colorado.edu