

Hamilton College

Hamilton Digital Commons

Posters

4-2022

Gender Discrimination in AI

Nicole Papert '22

Follow this and additional works at: <https://digitalcommons.hamilton.edu/posters>

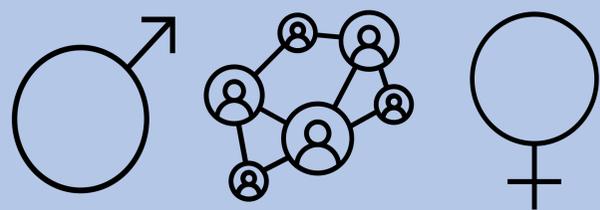
 Part of the [Mathematics Commons](#)

Gender Discrimination in AI: How Machine Learning Bias is Affecting Women in the Workforce

Nicole Papert

INTRODUCTION

Algorithms that job search sites run on are not fair. There are several studies revealing that AI tools used in job search applications and sites will promote different opportunities depending on the gender of the user. Specifically, men are typically shown more competitive job postings than women, given that the users have similar skills and qualifications. In this poster, I will closely examine why algorithms utilized for the job search process may present differently between men and women.



WHAT WOULD BIAS LOOK LIKE?

Section 2.3 of "Discriminated by an algorithm: a systematic review of discrimination and fairness by algorithmic decision-making in the context of HR recruitment and HR development" provides several relevant definitions for "objective fairness". The presence of any of these definitions means that there is either implicit or explicit discrimination behind the discrepancies between groups.

Table 1 Definitions of fairness

Name	Author	Definition
Individual fairness	Dwork et al. (2012)	"Similar" subjects should have "similar" classifications
Group fairness		Subjects in protected and unprotected groups have an equal probability of being assigned positive $\mathbb{P}(\hat{Y} = 1 G = 1) = \mathbb{P}(\hat{Y} = 1 G = 0)$
Equal opportunity	Hardt et al. (2016)	False-negative rates should be equal $\mathbb{P}(\hat{Y} = 0 Y = 1, G = 1) = \mathbb{P}(\hat{Y} = 0 Y = 1, G = 0)$

$Y \in \{0, 1\}$ is a random variable describing, e.g., the recidivism of a subject, \hat{Y} its estimator and $G \in \{0, 1\}$, describes whether a subject is a member of a certain protected group ($G = 1$) or not ($G = 0$)

GENDER BIAS IN AI RECRUITMENT

Bias can appear for a couple of reasons. The data collection process could be undersampling groups of people or utilizing some method other than random sampling. A real-life example is that machine learning is much less familiar with any fact that strays away from the white male identity (Lohr). Another way that bias can emerge is through feedback loops. There are also many companies that now require that you participate in AI-powered video games, such as pymetrics, that are meant to get a sense of an applicant's soft skills and personality (Wall and Schellmann). However, the AI is influenced greatly by differences in behavioral patterns between men and women and tends to favor traits that men possess more than women.



AI-POWERED JOB SEARCH SITES



CONCLUDING REMARKS

AI-powered tools used in HR Recruitment have much to improve upon. It is important to note that this issue is universal to machine learning algorithms in general, as any issue we attempt to eliminate bias from by using AI will only replicate the lack of objective fairness in human decision-making. However, acknowledging the flaws in machine learning algorithms will help us improve and tweak the technology in order to become better in the future.



Citations

Chamorro-Premuzic, Tomas. "Will AI Reduce Gender Bias in Hiring?" *Harvard Business Review*, 10 June 2019, <https://hbr.org/2019/06/will-ai-reduce-gender-bias-in-hiring>.
Jaser, Zahira, et al. *Where Automated Job Interviews Fall Short*. Harvard Business Review, 27 Jan. 2022, <https://hbr.org/2022/01/where-automated-job-interviews-fall-short>.
Köchling, A., Wehner, M.C. Discriminated by an algorithm: a systematic review of discrimination and fairness by algorithmic decision-making in the context of HR recruitment and HR development. *Bus Res* 13, 795–848 (2020). <https://doi.org/10.1007/s40685-020-00134-w>
Lohr, Steve. *Facial Recognition Is Accurate, If You're a White Guy*. The New York Times, 9 Feb. 2018, <https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html>.
Wall, Sheridan, and Hilke Schellmann. "LinkedIn's Job-Matching AI Was Biased. the Company's Solution? More AI." *MIT Technology Review*, MIT Technology Review, 23 June 2021, <https://www.technologyreview.com/2021/06/23/1026825/linkedin-ai-bias-ziprecruiter-monster-artificial-intelligence/>.