Using AI to Bring Fairness and Efficiency to Recruiting

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Amazon inadvertently brings a focus on resume screening

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Amazon scraps secret AI recruiting tool that showed bias against women

Jeffrey Dastin

8 MIN READ

SAN FRANCISCO (Reuters) - Amazon.com Inc's (AMZN.O) machine-learning specialists uncovered a big problem: their new recruiting engine did not like women.

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Resume screening is manual, bias-prone and expensive

Resumes from male candidates receive 50% more interview invitations than those from females. ¹ 'Whitened' resumes are twice as likely to receive interview calls. ²	Screening	Average Cost: \$4k - \$50k
Hiring managers rate hypothetical male applicants as more competent and hirable than identical female candidate. ³	Assessment	Average Time to Fill: 58 days
Lone minority candidates in finalist pools have almost no statistical chance of receiving an offer. ⁴	Offer	WOMEN IN
¹ Reviewed in Koch et al., <i>J. Appl. Psychol.</i> 2015. ² Kang et al., <i>Adm. Sci. Q.</i> 2016.	³ Moss-Racusin et al., <i>PNAS</i> , 2012. ⁴ Johnston et al., <i>HBR</i> 2016.	CONFERENCE

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Amazon's experiment uncovered both algorithmic and human biases



Ryan Broderick @broderick

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Amazon built an AI to rate job applications. It analyzed 10 years of (male dominated) hires. Then it started penalizing resumes that included the word "women's," downgrading graduates from all women's colleges, and highly rating aggressive language.



"Amazon's system taught itself that male candidates were preferable." No. This is not what happened. Amazon taught their system (with their own hiring data they fed it) that *they* prefer male candidates. This is not a small semantic difference in understanding the problem.

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Can we mitigate human bias through machine intelligence?

Research at TapRecruit

We help companies make better recruiting decisions

NLP and Data Science:

- What are distinguishing features of successful career documents?
- What skills are increasingly important for different industries?

Decision Science:

- How do candidates make decisions about which jobs to apply to?
- How do hiring teams evaluate candidate qualifications?

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This job is full-time, based in Los Angeles. We offer competitive compensation and stock option program.



You are what you measure

You are what you measure

North Star metrics are strategic, signpost metrics are tactical

	Signpost	North Star	
E-commerce	Add to Cart	Purchases	
Ad Tech	Ad Views	Ad Clicks	
Netflix	Content Views	Retention	
	Lower-level and specific	Indirect and longer-term	

Steven Kerr: <u>https://www.ou.edu/russell/UGcomp/Kerr.pdf</u> Carl Anderson: <u>http://bit.ly/northstar_signpost</u> Nirmal Govind: <u>http://bit.ly/ab_testing_beyond</u>

You are what you measure

North Star metrics are strategic, signpost metrics are tactical



Testing Metrics: Time to Fill

There is no standard endpoint for Time to Fill



Testing Metrics: Success

Time to Fill vs Success



The growth & impact of senior titles

Hypothesis: Inflated titles amplify signal and reduce noise



Title inflation fails to deliver

Fewer qualified applicants, lower chance of success



There's a reason we associate black boxes with plane crashes

The impact of one word

What accounts for the difference in candidate pool size?



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Context is queen

Understanding candidate behavior is critical



The double whammy of senior titles

Inflated titles drive fewer job views and fewer applications



Inflated titles attract fewer women

Fewer female candidates and a lower chance of a female hire

	Data Scientist	Senior Data Scientist	
Female	39	8	4x
Applicants	(36%)	(23%)	(+50%)
Qualified	2	1	2x
Female Apps	(32%)	(26%)	(+23%)
Chance of Female Hire	39%	15%	WOMEN IN ANALYTICS CONFERENCE

Jobs with deflated titles are hit once

Junior titles have lower job views but higher application rates



Recruiting is a conversation, not a filibuster

JDs communicate company culture

The things you say (and don't say!) speak volumes

Project – Strategy Manager

Hooli – Palo Alto, CA

Hooli's vision and mission: Our vision is to make Palo Alto the global model for inclusive innovation and economic growth, fueled by the City's diverse people and businesses. Our mission is to make investments in strengthening neighborhoods and spurring the creation of good jobs.

Hooli's Strategy Department: The Strategy department is a ten-member team that takes an objective, collaborative, and hypothesis-driven approach to solving problems and facilitating decision-making for senior leaders at Hooli and in City government. Our projects fall into five key categories:

Strategic and operational advisory: working with senior leaders at Hooli and in City government to shape and direct existing initiatives to target policy and financial outcomes (e.g., developing tenanting strategies for Hooli real estate assets,)

Project management: supporting Hooli and City Hall with project management of large-scale projects, often cutting across agencies (e.g., coordinating the City's 2017 Jobs Plan)

New initiative ideation and diligence: assessing the need for a new policy or program and building the case for investment with senior leadership (e.g., analyzing Hooli actions for technologies such as cybersecurity, blockchain, artificial intelligence and autonomous vehicles)

Procurement: managing the procurement process of a set of economic development consulting firms for Hooli teams and other City agencies (e.g., helping the Mayor's Office of the Chief Technology Officer with the scope and BEP selection for a citywide broadband implementation plan)



Job descriptions have sweet spots

More words don't attract more qualified candidates



Fewer Applications: Long JDs receive 20% fewer applications.

Fewer Qualified Apps: Of the candidates that do apply, fewer are qualified enough to make it through screening and interview processes.

Less Successful Job Searches: Long JDs are less likely to result in a hire.

Can we mitigate human bias through machine intelligence?

You are what you measure

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- Not all metrics are created equally: the case of TTF vs Success
- Title inflation decreases signal with no change to noise

There's a reason we associate black boxes with crashes

- Going beyond explainable algorithms to testing hypotheses
- The double-whammy of the visibility and confidence gaps

Recruiting is a conversation, not a filibuster

• Poor internal processes can (unintentionally) create adverse outcomes

Acknowledging the Bias Stack

Cognitive and algorithmic biases aren't the only problems in AI

Algorithmic Biases Biased training data Bad metrics

Cognitive Biases Confirmation/Projection Biases Affinity Bias and other heuristics

Process Biases

Recruiting sources that we privilege (e.g. referrals) Contexts that activate cognitive biases (e.g. overload)

Thank you WiAC!

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