

Auditing for Racial Discrimination in the Delivery of Education Ads

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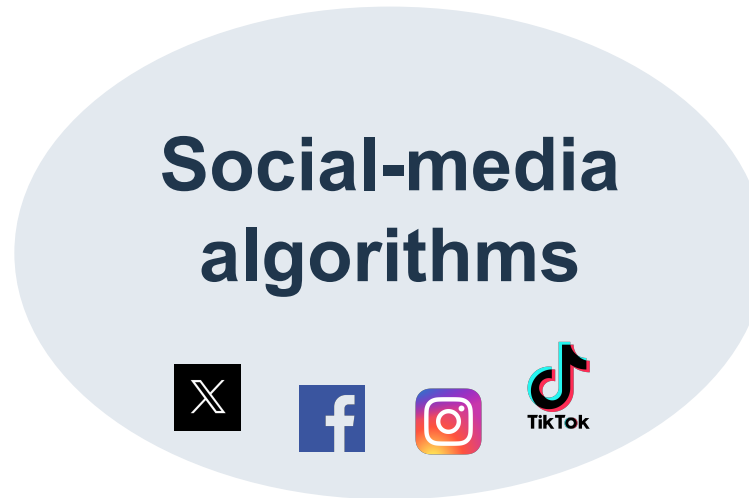
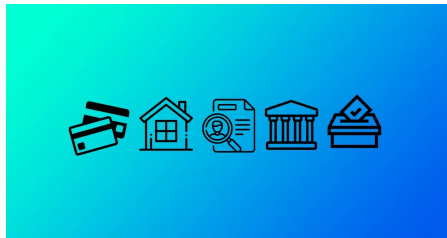
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Harms of AI Adoption in Social-media Algorithms

Shape **access** to information and **economic opportunities** for **billions** of users



Facebook Algorithm Shows Gender Bias in Job Ads, Study Finds

Researchers found the platform's algorithms promoted roles to certain users; company pledges to continue work in removing bias from recommendations

POLITICS / STUDENTNATION / JANUARY 11, 2024

Can the EU's Digital Services Act Inspire US Tech Regulation?



Ad Delivery Algorithms Can be Biased

- **Evidence of discrimination by legally protected demographic attributes**
 - Not due to targeting choices by advertiser
 - Platform-induced bias: optimization for “relevance”
 - For economic opportunities such as housing and employment
- **Meta sued by DOJ for discriminatory ad delivery**
 - Deployed Variance Reduction System for housing, employment and credit ads

Prior audits and solutions limited to only housing, employment, and credit!

Our Contributions: Auditing Education Ad Delivery for Racial Bias

- **A method for testing racial discrimination in education ad delivery**
 - We use a black-box approach
- **We find racially biased delivery of education ads caused by platform-driven choices**
 - We apply the method to Meta
 - Racially balanced audience (in), but skewed delivery audience (out)



Why Study Education: Concerns of Discrimination

- **30+ for-profit schools investigated for predatory marketing**
 - Over-promised job prospects, lead to high debt, ...
- **Historically targeted racial minorities** [Body '19]
 - Legal protections against discrimination
- **Education is one of the largest advertising verticals** [Wernerfelt et al. '22]

Do ad delivery algorithms propagate the historical racial bias among for-profit universities?



Challenge of Extending Prior Audits to Education

- **No method that controls for legitimate sources of skew for education**
- **We extend a prior auditing method: paired ads**
 - Tied to underlying de-facto skew in society
 - Run at the same time, audience, budget, ... [Ali and Sapiezynski et al. '19, Imana et al. '21]
 - Look at **relative difference** in delivery

How to identify such a pair of opportunities **for education?**



Methodology: Isolating the Role of Ad Delivery Algorithm for Education

- Similar opportunities but one is of inferior quality (for-profit)
- Pick schools with de-facto racial skew in enrollment

Hypothesis: the for-profit school ad will be shown to relatively more Black individuals

For-profit University



The image shows a Facebook advertisement for Strayer University. At the top, it says "Education Path Sponsored" with a small globe icon and a close button. Below that, the text reads "Enroll in an online degree program at Strayer University". The main image is a photograph of a modern, multi-story brick building with a sign in front that says "STRAYER UNIVERSITY". At the bottom of the ad, it says "strayer.edu", "Strayer University", and "Earn an accredited certifi...". There is a "Learn more" button on the right.

Strayer University
79% Black

Public University



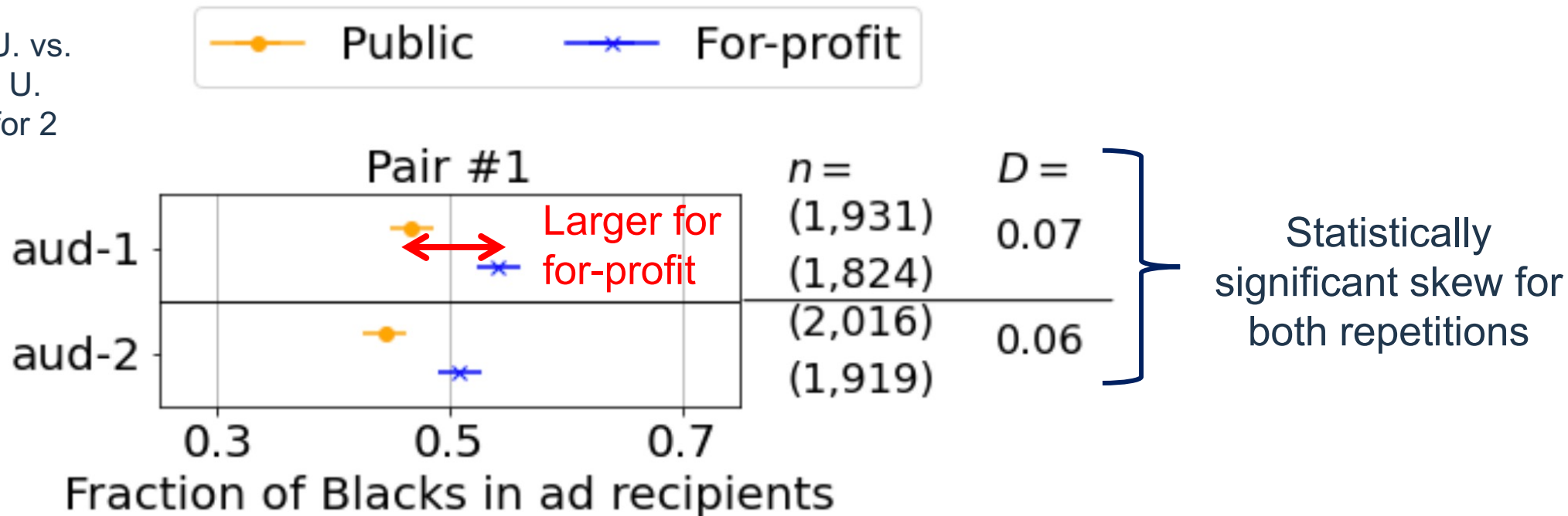
The image shows a Facebook advertisement for Colorado State University. At the top, it says "Education Path Sponsored" with a small globe icon and a close button. Below that, the text reads "Enroll in an online degree program at Colorado State University". The main image is a photograph of a stone sign that says "Colorado State University" and "Founded 1870". At the bottom of the ad, it says "online.colostate.edu", "Colorado State University", and "Earn your bachelor's from...". There is a "Learn more" button on the right.

Colorado State University
3% Black



Experiment: Racially Biased Delivery

Pair #1: Strayer U. vs. Colorado State U.
(Similar results for 2 other pairs)



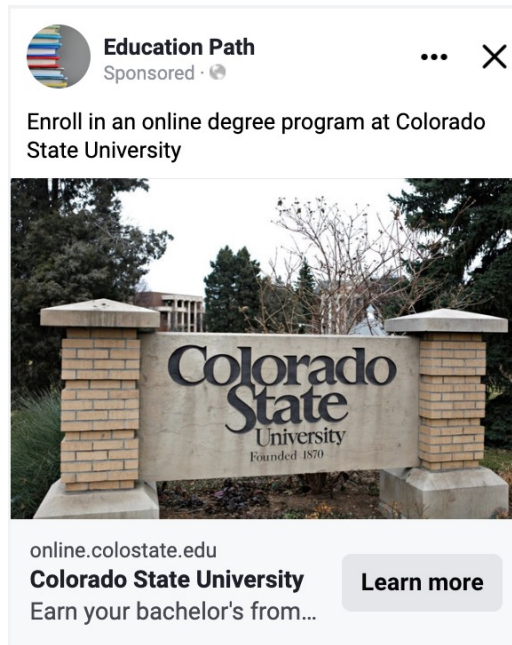
- ⇒ Meta's algorithms *racially* discriminate in education ad delivery
- ⇒ Meta may be in violation of education anti-discrimination law
- ⇒ Not limited to housing, employment, and credit



Compare Neutral and Realistic Ad Creatives

Neutral ad creative

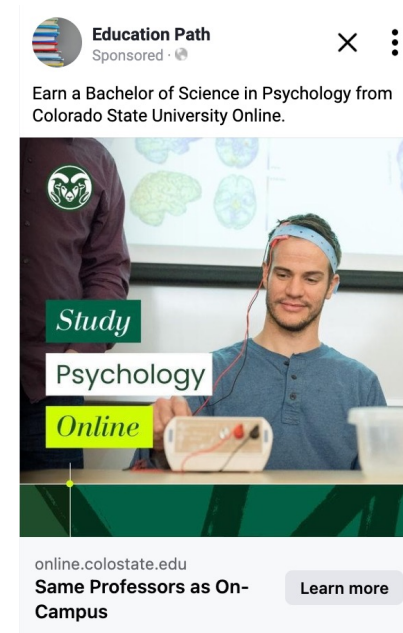
(Built by us)



Fairer: avoid potential text- or image-based skew

Realistic ad creative

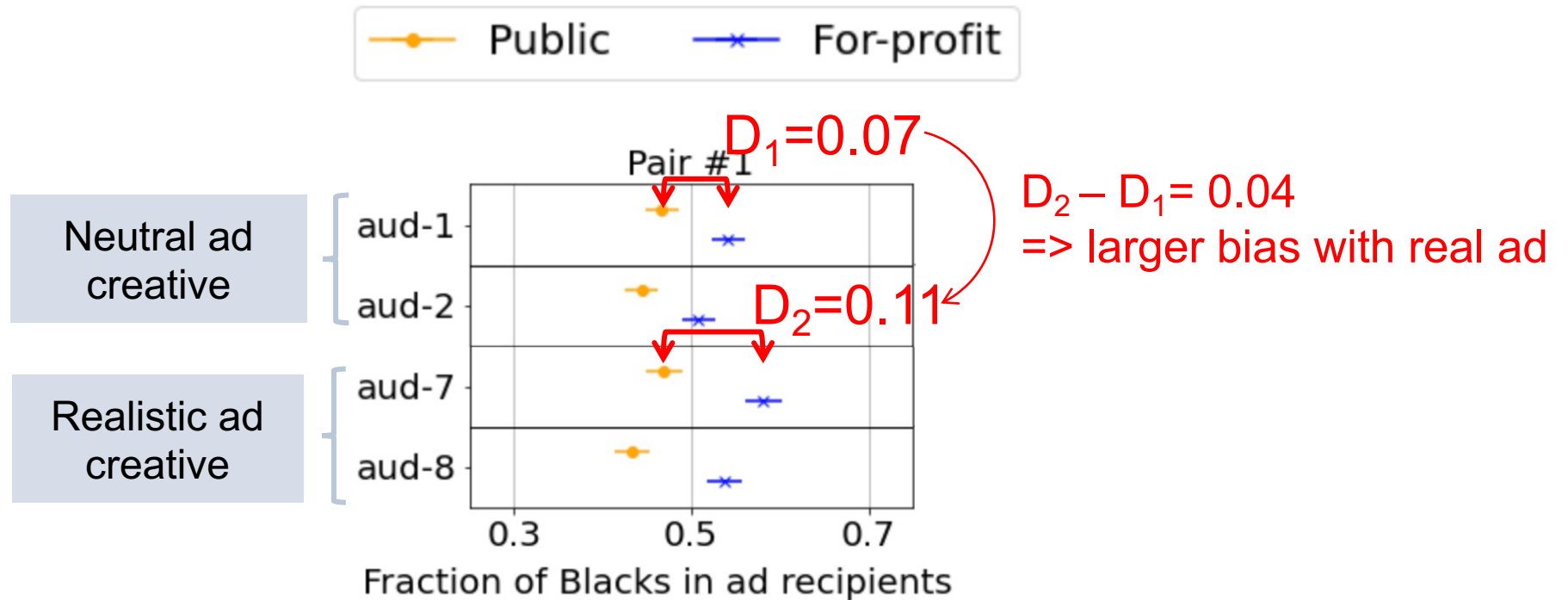
(From school's Ad Library page)



Realer: captures additional effects of real-world ads

Experiment: Larger Bias with Realistic Ad Creatives

Pair #1: Strayer U. vs. Colorado State U.
(Similar results for 2 other pairs)



⇒ Platforms amplify implicit cues in ad creatives used by schools
 ⇒ Bias in ad delivery is larger with real ads



Evaluate Delivery Using Predatory Schools

- **Modify our method: use for-profit schools sued for predatory marketing practices**

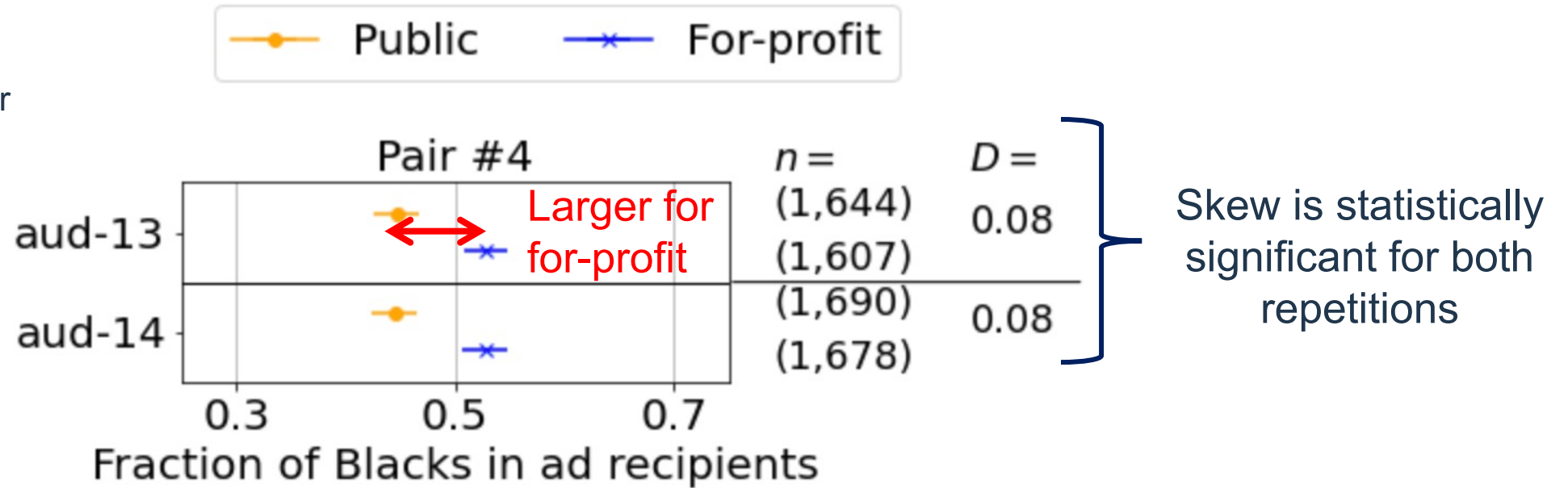
Does Meta's ad delivery algorithm promote opportunities at such schools disproportionately by race?

- **Identify three schools (using Department of Education data)**
 - For-profit: DeVry University, Grand Canyon University, Keiser University
 - Same public schools as before



Experiments: Biased Delivery of Ads for Predatory Schools

Pair #4: DeVry U. vs. Colorado State U.
(Similar result for 2 other pairs)



- ⇒ Racially disproportionate delivery of low-quality opportunities
- ⇒ Meta can perpetuate skew even if schools improve marketing practices



Conclusion

- Platforms need to conduct impact assessment of education ad delivery algorithms
- Broader auditing/regulation needed beyond housing, employment, credit ads
- Researchers can apply our method to new domains
- Paper: <https://doi.org/10.1145/3630106.3659041>
- Data: <https://ant.isi.edu/datasets/addelivery-education/>
- Contact: imana@princeton.edu

