ALGORITHMIC HIRING BIAS

USED BY LARGER COMPANIES
SCREENING PROCESS

COSTS

$ computer algorithm < $ human screener

COSTS

$ computer algorithm < $ human screener

EFFICIENCY

Advance candidate pools quickly and accurately

COSTS

$ computer algorithm < $ human screener

EFFICIENCY

Advance candidate pools quickly and accurately

FAIRNESS

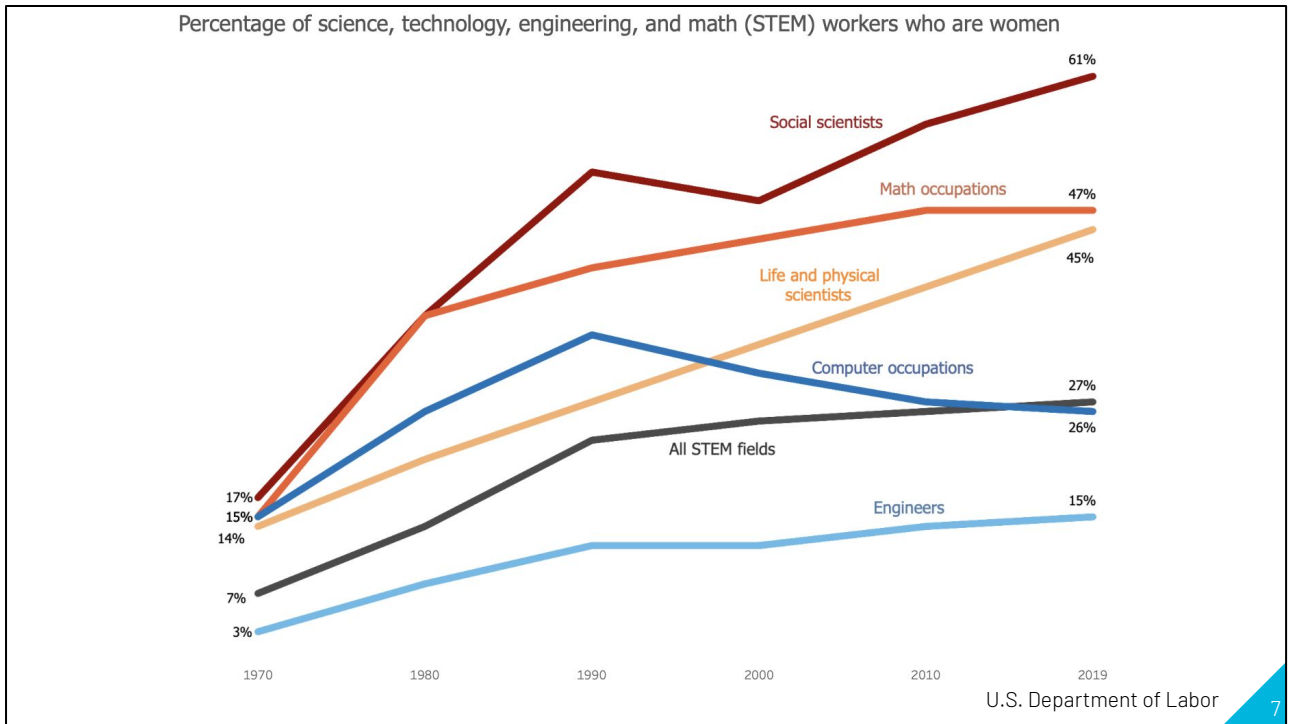Eliminate individual biases from human screeners

FAIRNESS

Data-driven hiring processes often
perpetuate systematic discrimination

Algorithmic hiring processes use training and testing data to optimize a model to select candidates that are similar to the successful employees at a company. If the model is trained on past employment data, it will discriminate against people with identities that do not align with the majority of successful employees at the company.

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The data I am using focuses on percentages male and female employees in specific fields. I understand that there are many more genders to analyze and that many more identities experience bias from these algorithms, and I plan to address action items regarding this later in the presentation.

Percentage of science, technology, engineering, and math (STEM) workers who are women

U.S. Department of Labor

Algorithmic Hiring Processes take in data from the current and past workforce to create their models. In in-demand and high-paying careers, such as STEM fields, women have historically and are currently underrepresented, making optimized models based off past data have bias against female applicants.

20%
Of Computer Programmers and Software Developers in the U.S. are Women

49%
Of Mathematicians and Statisticians in the U.S. are Women

These two professions are involved in the development of algorithmic hiring models. The lack of equal representation in the professions that develop machine learning algorithms contributes to the lack of attention and transparency to bias in the models.

How do companies implement these algorithms?

- Internally

Large companies, especially those with many computer programmers and software developers attempt to create their own models for algorithmic hiring. These tools are limited because they only have access to data from their own employees, and the goal of these models is to optimize and create the lowest possible margin of error, opening the door for discrimination.

Why Amazon's Automated Hiring Tool Discriminated Against Women

By Rachel Goodman, Staff Attorney, ACLU Racial Justice Program
OCTOBER 12, 2018 | 1:00 PM

TAGS: Women's Rights in the Workplace, Women's Rights, Privacy & Technology

Technology & Ideas

Amazon's Gender-Biased Algorithm Is Not Alone

They're everywhere, but nobody wants to know about it.

By Cathy O'Neil +Sign Up
October 16, 2018, 6:00 AM PDT

Amazon attempted to create their own hiring model with a historically male technical team. This led to the algorithm replicating the existing pool of employees, which excluded the majority of female applicants.

- One way to work with a larger and more diverse dataset is to have a 3rd party company create the model
- A multitude of startups have emerged that focus on algorithmically screening candidates
- How are these companies validating their models for correctness and fairness
- Examine Validation: have these companies ensured that their model works as expected on data it has not seen
- Examine Fairness: do these companies take steps to de-bias their models

Validation

11% conducted studies

72% do not mention validation

Cornell University did a study of these 3rd party companies

Validation

11% conducted studies

72% do not mention validation

Fairness

17% pass 4/5th law

44% mention bias

17% do not mention bias

4/5th law, which requires that minority candidates are accepted at at least 80% of the rate of the majority candidates

It is rare for these companies to be transparent about validation and bias in their models. This lack of transparency is concerning when these companies determine who gets an interview.
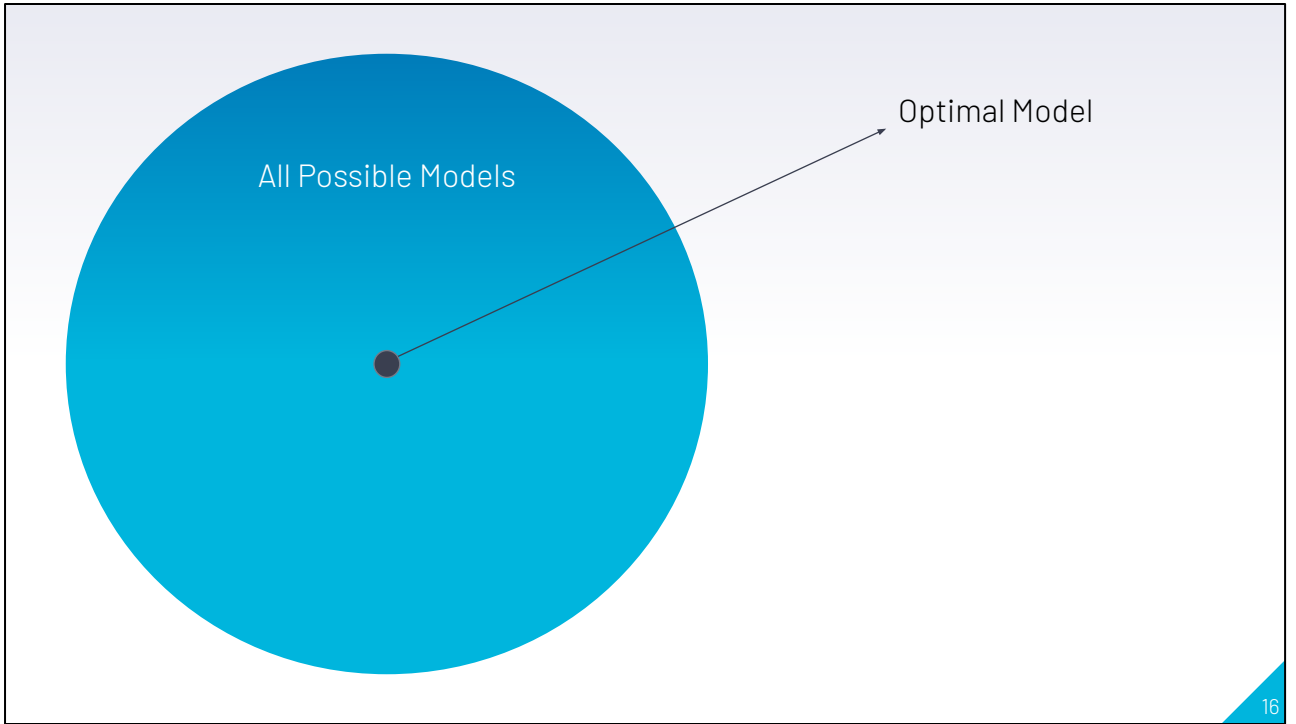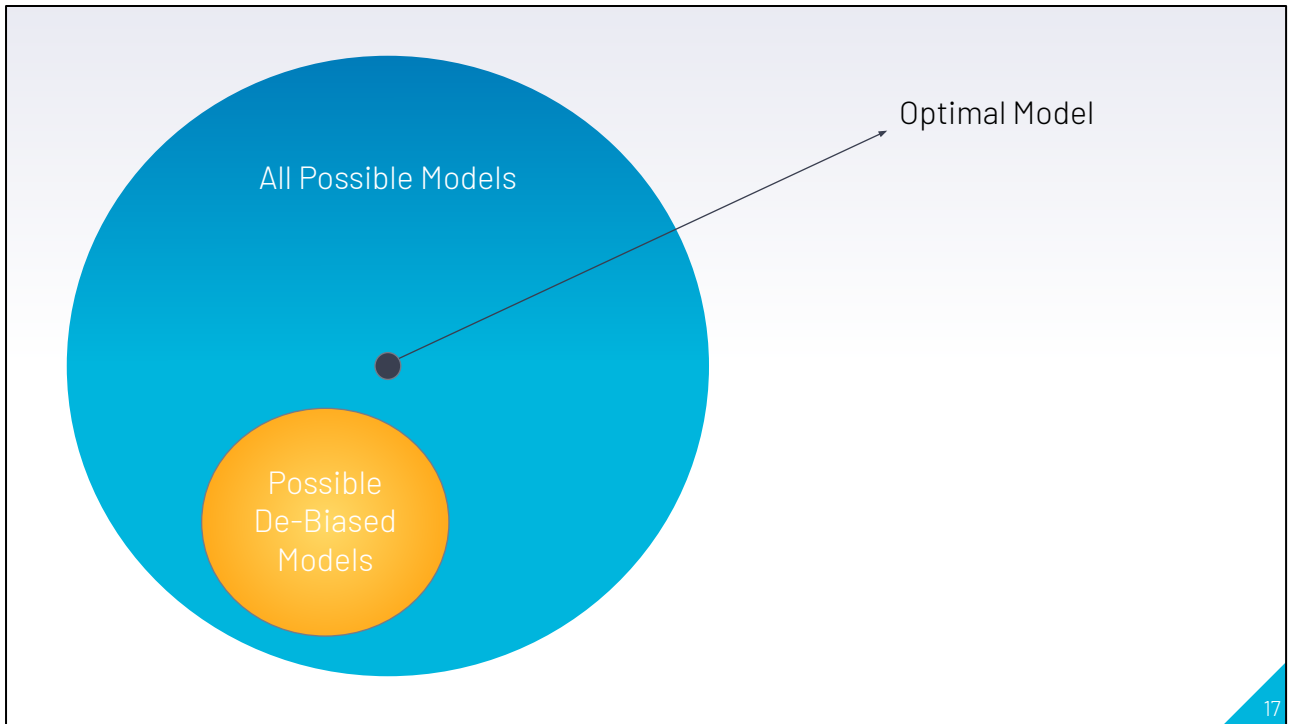
Rethinking Research Priorities

All Possible Models

All Possible Models

Optimal Model

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Mathematically, you can add multiple constraints in a debiasing model to address different identities, such as gender and race.
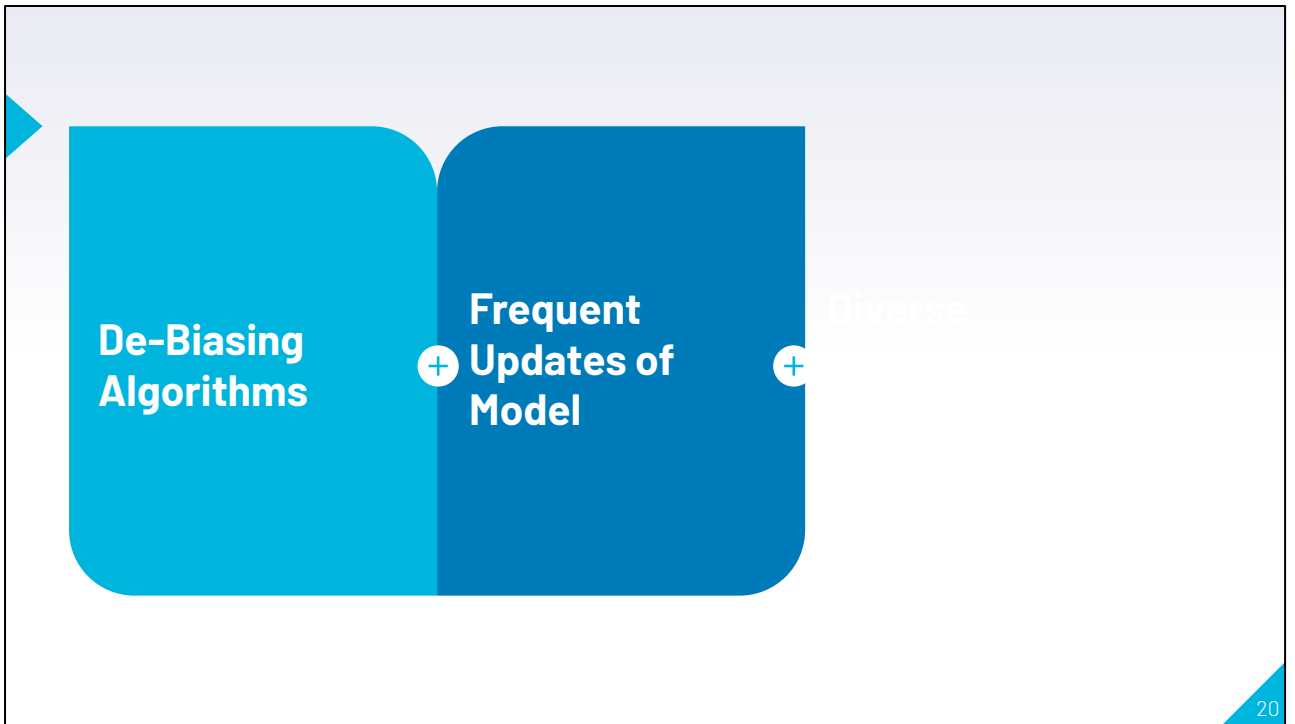
Engineering Innovation Processes

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De-Biasing Algorithms

Mathematically ensure that the model ranks people from different identities equally

De-Biasing Algorithms + Frequent Updates of Model + Diverse

As the workforce begins to have more representation and equitable hiring processes, use that data to fit the models

De-Biasing Algorithms

+ **Frequent Updates of Model**

+ **Diverse Implementation Team**

Ensure that the people implementing these models are from diverse backgrounds to increase fairness in the development process

Next Steps

Legislation and
Accountability

"Black Box" excuse for discriminatory algorithms
Need legal accountability for decision-making algorithms

Next Steps

Legislation and
Accountability

Intersectional
Considerations

We can ensure that different backgrounds are rated equally in a model, but a person
who falls into multiple categories, must also be rated equally

Next Steps

Legislation and
Accountability

Small Company
Accessibility

Intersectional
Considerations

These algorithms are mostly available for large companies with more employee data, making it so small companies still have individual bias in their screening process

THANK YOU