



# Discrimination in Technology

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We envision a nation  
where **communities of  
color thrive** and race  
is never a barrier to  
economic opportunity



\$1.00

WHITE

\$0.68

ASIAN

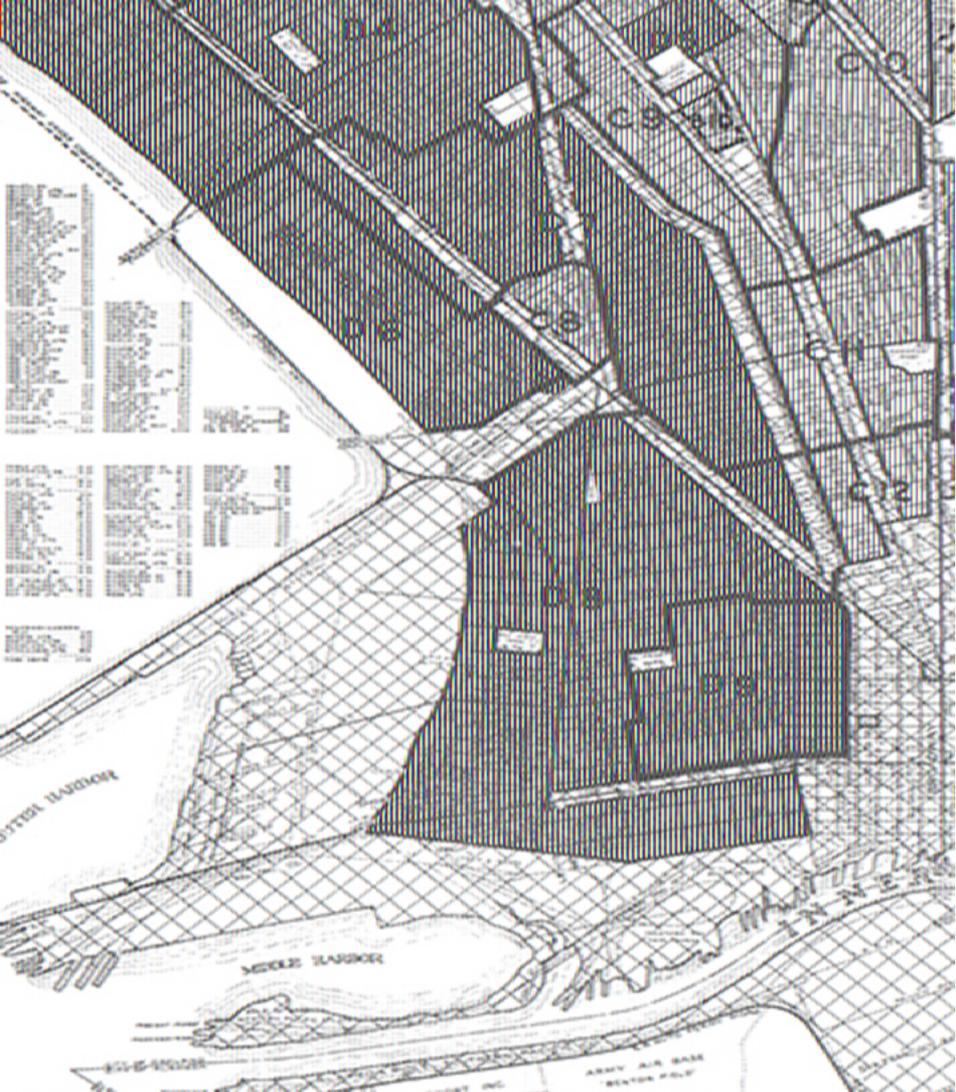
\$0.10

LATINO

\$0.08

BLACK

For every dollar of wealth a white family has, the median black family has eight cents.



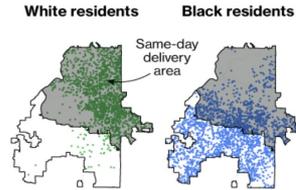
**REDLINING** is the illegal practice of denying services to communities of color



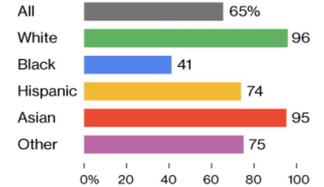
# The legacy of redlining lives on in the data that guides decisions on who gets access to new technologies and services and in the datasets that power algorithms and A.I.



The northern half of Atlanta, home to 96% of the city's white residents, has same-day delivery. The southern half, where 90% of the residents are black, is excluded.



**Percentage of residents living in ZIP codes with same-day delivery**



MIT Technology Review

## Amazon Prime or Amazon Redline?

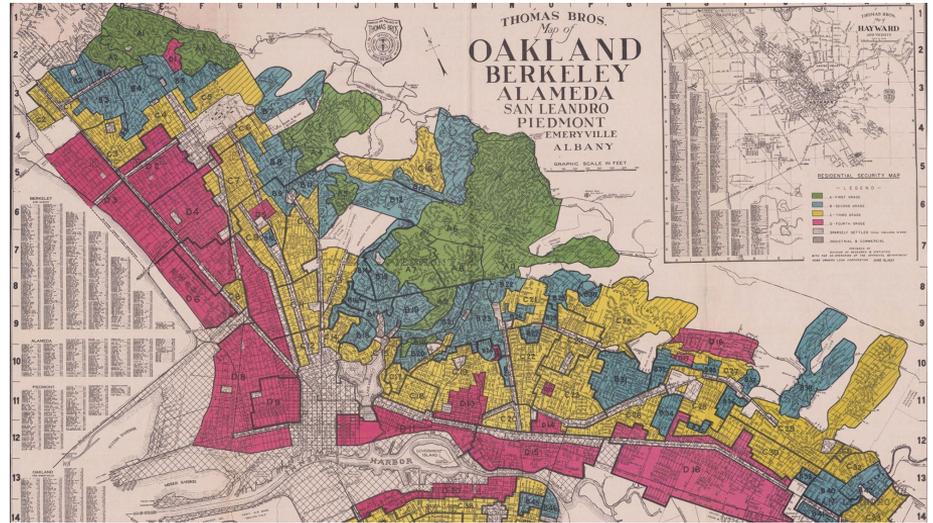
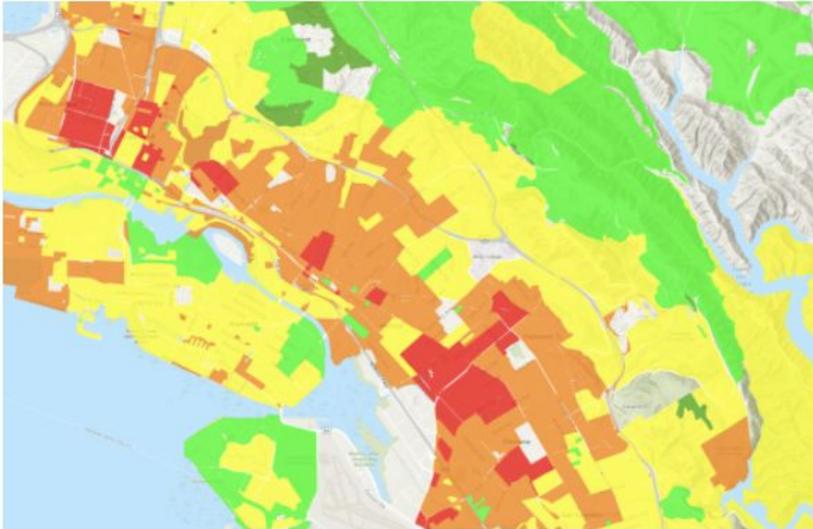
Amazon's same-day delivery service skirts many predominantly minority neighborhoods, raising a familiar charge that tech-company business imperatives can result in de facto digital inequality.

Source: Bloomberg (2016)



# DIGITAL REDLINING IN INTERNET ACCESS

Low-income communities are the last to receive investments in internet infrastructure because they are less profitable than wealthier (and whiter) communities.

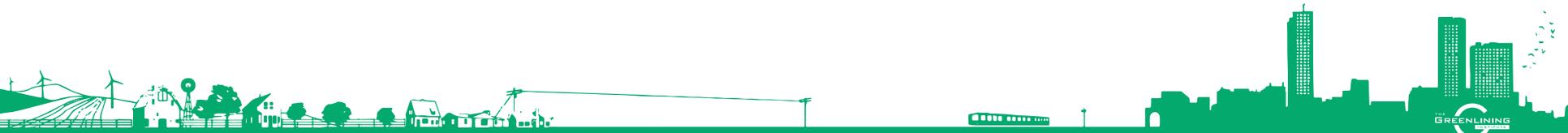


# HOME BROADBAND ADOPTION RATES

Home broadband adoption is key for academic and socioeconomic success but there are significant racial and income gaps to access that remain despite the pandemic shift to internet-based remote work.

White	80% (+1%)
Black	71% (+5%)
Hispanic	65% (+4%)
\$100,000+	93% (N/A)
\$30,000-\$99,999	83% (N/A)
<\$30,000	57% (+1%)

Source: Pew (2021), (+%) based on 2019 data, (N/A) due to changes in Pew measurement methodologies since 2019.

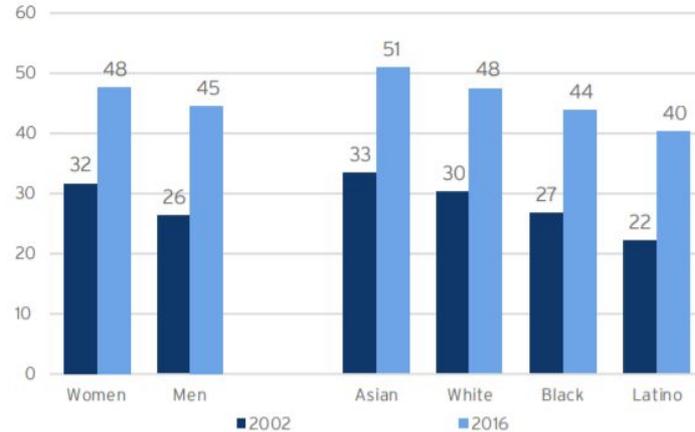


# THE DIGITAL SKILLS DIVIDE

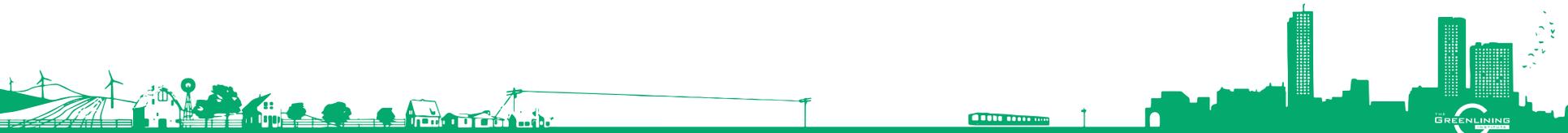
Measurements of digital skills show a clear racial divide. This gap impacts the ability of our communities to get access to quality, high paying jobs.

Average digital scores by demographic group

2002 and 2016



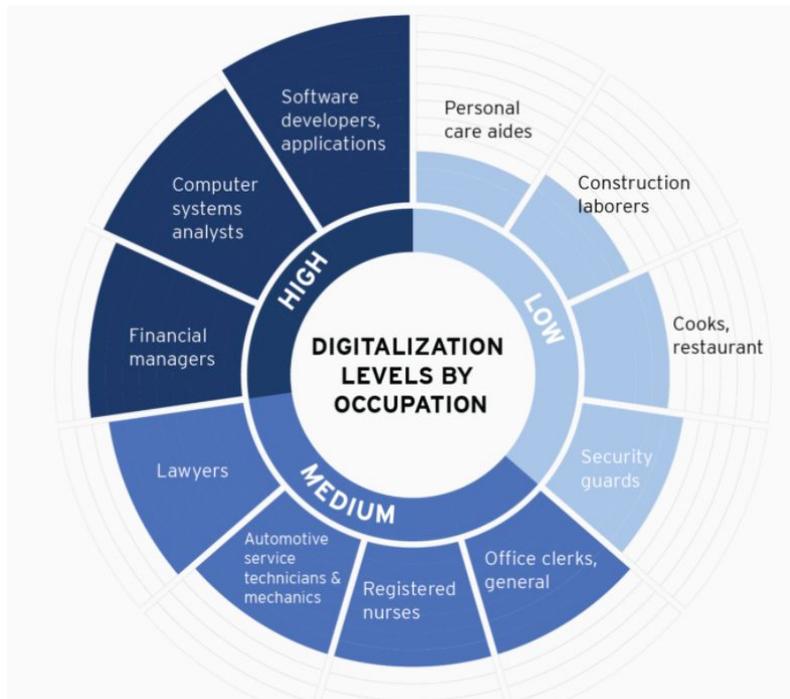
Source: Brookings analysis of O\*NET and CPS data



# THE DIGITAL SKILLS DIVIDE

Broadband access is a critical tool for building wealth and economic opportunity for communities of color.

- 84% of job seekers used the internet to find employment.
- Unemployed people who used the Internet in a job search were re-employed 25% faster, the average job search is 5 months.
- 87% of higher paying “middle-skill” jobs require digital skills.



**Mean Annual Wage**

High Digitalization:  
\$72,896

Medium Digitalization:  
\$48,274

Low Digitalization:  
\$30,393

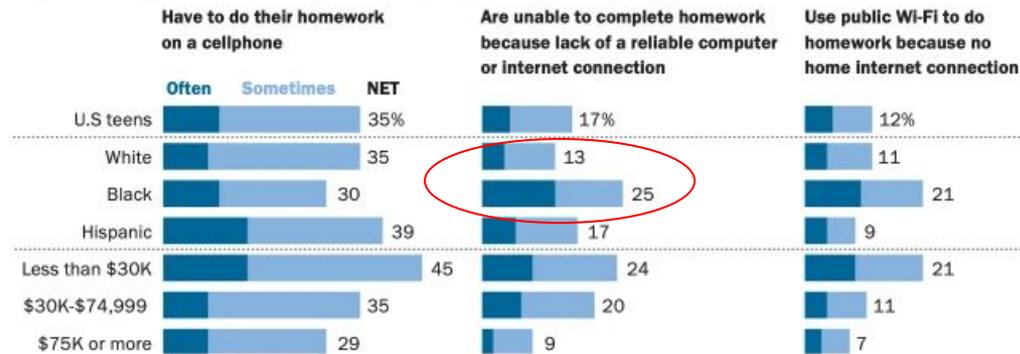
# THE DIGITAL DIVIDE & HOMEWORK GAP

Black students face the worst impacts of the homework gap.

- Black teens are almost 2x as likely to report that they can't complete their homework due to lack of a computer or reliable internet.
- High school students with broadband access at home have graduation rates 6 to 8% higher than those without.
- 73% of large school districts went fully online during the pandemic.
- Prior to the pandemic, 70% of homework assignments required Internet access.
- Students with access to internet at home score higher 10-20% higher on math, science and reading tests.

## Black teens and those from lower-income households are especially likely to be affected by the digital 'homework gap'

*% of U.S. teens, by race and ethnicity or annual family income, who say they often or sometimes ...*



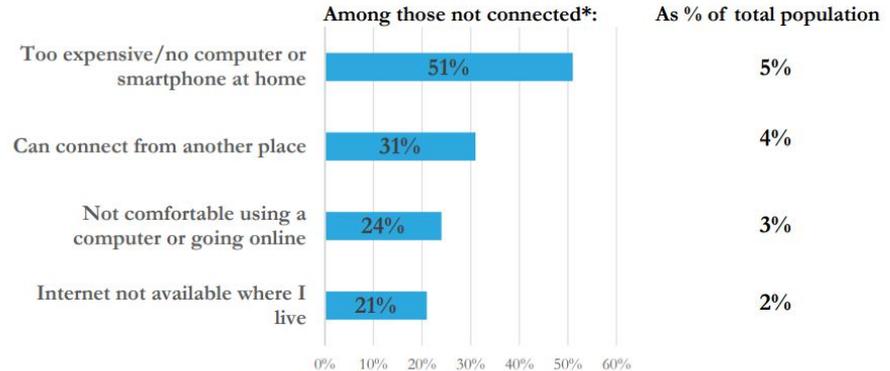
Source: Pew (2018)



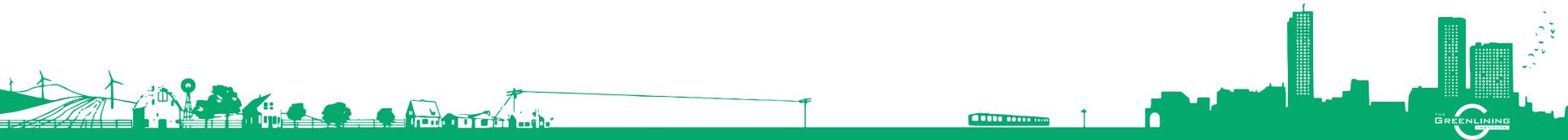
# The Digital Divide & Affordability

The cost of the internet and of computing devices are the biggest driver of the digital divide among those that are not connected.

Table 6  
Self-Reported Reasons for Lack of Internet Connectivity at Home



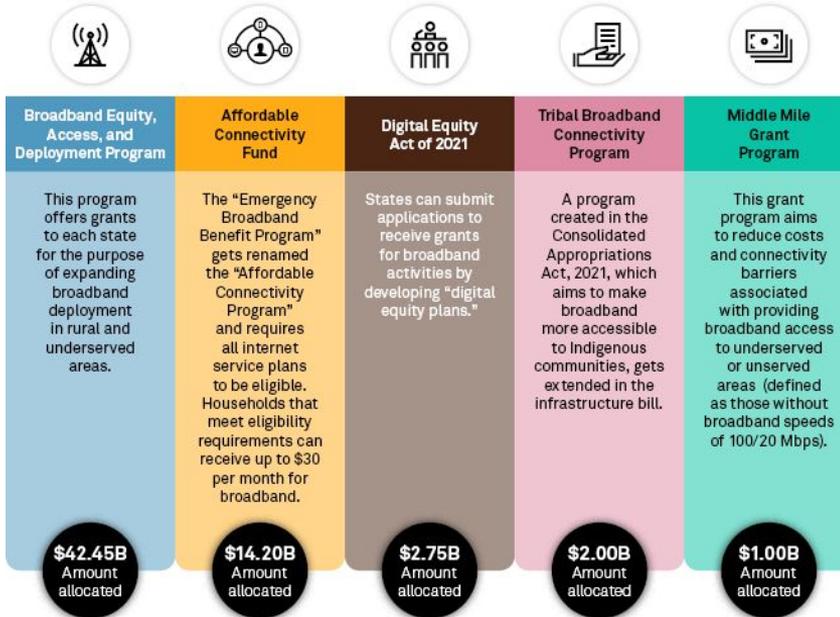
Source: CETF Annual Survey (2019)



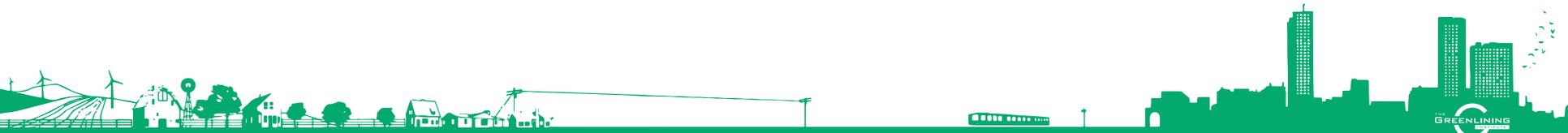
# SOLUTIONS

- Affordability
- Outreach
- Deployment
- Competition
- Data

## Key broadband provisions in infrastructure bill



As of Aug. 4, 2021.  
Credit: Arleigh Andes  
Source: U.S. Senate Committee on Environment and Public Works



**Data collection and automated decision-making can perpetuate **algorithmic redlining** in ways that negatively impact the health and wealth of our communities.**

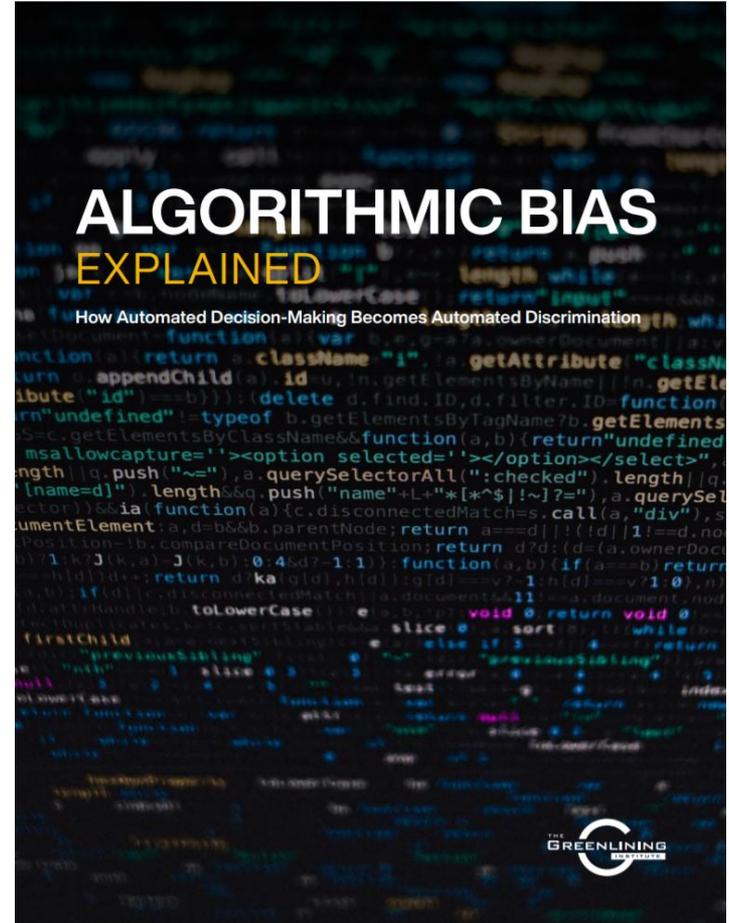
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# ALGORITHMIC BIAS

## Definitions:

**ALGORITHM:** An algorithm is a set of rules or instructions used to solve a problem or perform a task. Some algorithms are designed to make predictions and answer questions. These **automated decision systems** can use statistical patterns and data analytics to make decisions that control access to services and economic opportunity.

**ALGORITHMIC BIAS:** Algorithmic bias occurs when an algorithmic decision creates unfair outcomes that unjustifiably and arbitrarily privilege certain groups over others.



# ALGORITHMS ARE GATEKEEPERS TO ECONOMIC OPPORTUNITY

Algorithmic systems play increasingly important roles in:

- Bank loans;
- Pricing of goods and services;
- Insurance;
- Housing;
- Education;
- Hiring and promotions;
- Criminal justice risk assessments;
- Access to public benefits;
- Housing determinations;
- Access to healthcare

## Individual and Collective Harms of Discriminatory AI:

Individual Harms Illegal Discrimination   Unfair Practices	Collective Social Harms
Hiring Employment Insurance and Social Benefits Housing Education	Loss of Opportunity
Credit Differential Prices of Goods	Economic Loss
Loss of Liberty Increased Surveillance Stereotype Reinforcement Dignitary Harms	Social Stigmatization

Source: The Algorithmic Justice League

Denied

# The Secret Bias Hidden in Mortgage-Approval Algorithms

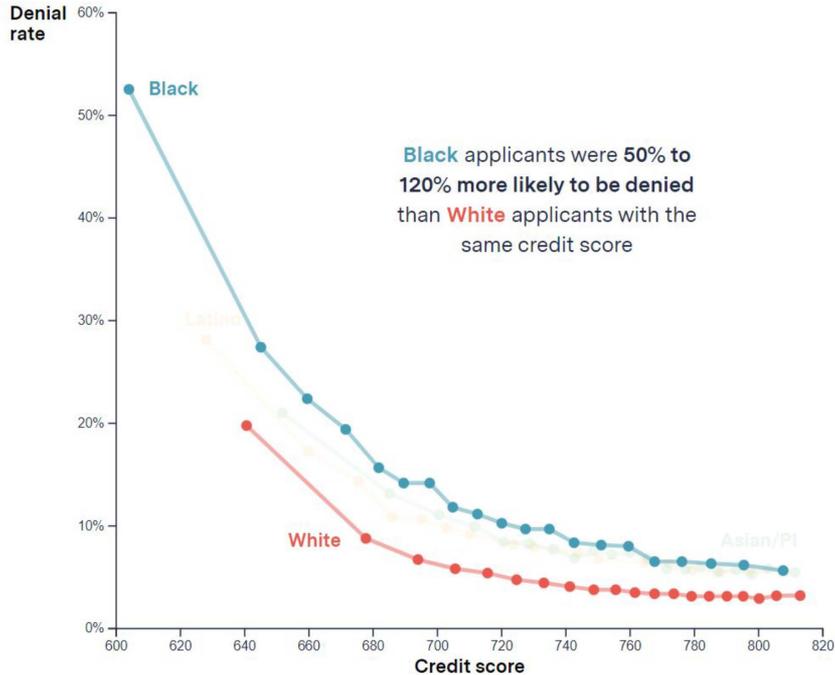


Nationally, loan applicants of color were **40%–80%** more likely to be denied than their White counterparts

In certain metro areas, the disparity was greater than **250%**

## Applicants of color were significantly more likely to be denied than White applicants with comparable credit scores

Denial rate by credit score and race/ethnicity



Source: CFPB, "An Updated Review of the New and Revised Data Points in HMDA"

## Applicants of color denied at higher rates

To illustrate the odds of denial that our analysis revealed, we calculated how many people of each race/ethnic group would likely be denied if 100 similarly qualified applicants from each group applied for mortgages in Los Angeles-Long Be

7 White applicants denied



8 Latino applicants denied

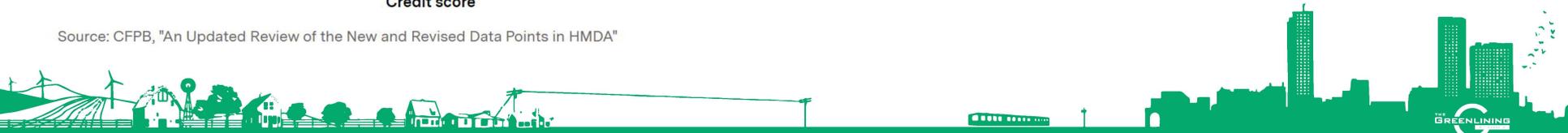


12 Black applicants denied



Findings were unreliable for Asian/Pacific Islander and Native American applicants.

Source: 2019 HMDA Data, illustrations from ProPublica. We applied the odds ratios from our regression to White applicants' actual denial rates to calculate the number of denials for each racial and ethnic group above. These numbers are not the actual denials or actual number of applications in each location, but rather have been standardized for comparison. We rounded to the nearest person.



“Face-to-face and FinTech lenders charge Latinx/African-American borrowers 6-9 basis points higher interest rates . . . In aggregate, Latinx/African-Americans pay \$250-\$500M per year in extra mortgage interest.

**FinTech algorithms have not removed discrimination, but may have shifted the mode.”**

- Bartlett, Robert, et al. Consumer-lending discrimination in the FinTech era. National Bureau of Economic Research, 2019.

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**MACHINE BIAS**

# Facebook (Still) Letting Housing Advertisers Exclude Users by Race

After ProPublica revealed last year that Facebook advertisers could target housing ads to whites only, the company announced it had built a system to spot and reject discriminatory ads. We retested and found major omissions.

by Julia Angwin, Ariana Tobin and Madeleine Varner, Nov. 21, 2017, 1:23 p.m. EST



Facebook CEO Mark Zuckerberg speaks in San Jose, California, in October 2016. (David Paul Morris/Bloomberg via Getty Images)

Edit "Good zip codes audience" Audience

Add locations



Drop Pin

Your audience selection is **great!**

Potential Audience Size: 631,000 people

Specific Broad

Delete Cancel Save

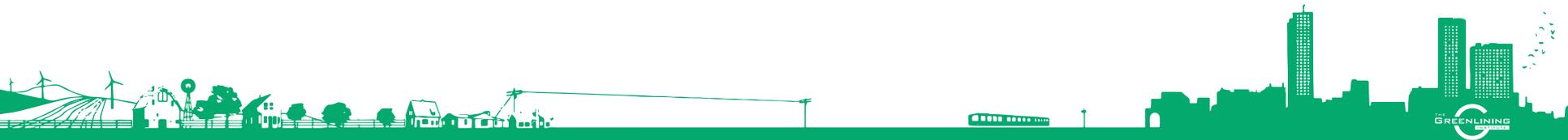
# Data collection enables precise and predatory algorithmic targeting.

Data collection and analytics can allow companies to increase prices or target predatory services towards vulnerable consumers.

## Sample List of Targeting Products Identifying Financially Vulnerable Populations <sup>26</sup>

- Credit Reliant
- Rocky Road
- Very Elderly
- Rolling the Dice
- Fragile Families
- Very Spartan
- X-tra Needy
- Hard Times
- Burdened by Debt: Singles
- Mid-Life Strugglers: Families
- Credit Crunched: City Families
- Relying on Aid: Retired Singles
- Struggling Elders: Singles
- Retiring on Empty: Singles
- Small Town Shallow Pockets
- Rural and Barely Making It
- Tough Start: Young Single Parents
- Living on Loans: Young Urban Single Parents
- Rough Retirement: Small Town and Rural Seniors
- Ethnic Second-City Strugglers
- Enduring Hardships
- Humble Beginnings
- Financial Challenges
- Meager Metro Means

This is a table listing several customer "segments" or categories that advertisers can use to specifically target vulnerable customers with ads. For example, customers in the "Hard Times" segment were described as "older, down-scale and ethnically-diverse singles typically concentrated in inner-city apartments... the bottom of the socioeconomic ladder, the poorest lifestyle segment in the nation ... this is an underclass of the working poor and destitute seniors without family support."



POLICY

# Science Career Ads Are Disproportionately Seen by Men

Marketing algorithms prevent many women from seeing the advertising, even though it's illegal to target jobs to one gender

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By Dina Fine Maron on July 25, 2018



Credit: Getty Images

BUSINESS NEWS

OCTOBER 9, 2018 / 11:12 PM / A YEAR AGO

# Amazon scraps secret AI recruiting tool that showed bias against women

Jeffrey Dastin

8 MIN READ





**The Washington Post**

*Democracy Dies in Darkness*



**Health**

# Racial bias in a medical algorithm favors white patients over sicker black patients

NEWSLETTERS • EYE ON A.I.

## HireVue drops facial monitoring amid A.I. algorithm audit

BY JEREMY KAHN

January 19, 2021 9:01 AM PST



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**Michigan**

## Michigan unemployment agency made 20,000 false fraud accusations - report

**Automated system erroneously accused claimants in 93% of cases, state review finds: 'It's balancing the books on the backs of the poorest,' lawyer says**



Allstate's Algorithm

## Suckers List: How Allstate's Secret Auto Insurance Algorithm Squeezes Big Spenders

February 25, 2020 05:00 ET

Matt Chase

Insurers are supposed to price based on risk, but Allstate's algorithm put a thumb on the scale

By [Maddy Varner](#) and [Aaron Sankin](#)



*Bernard Parker, left, was rated high risk; Dylan Fugett was rated low risk. (Josh Ritchie for ProPublica)*

# Machine Bias

There's software used across the country to predict future criminals. And it's biased against blacks.

*by Julia Angwin, Jeff Larson, Surya Mattu and Lauren Kirchner, ProPublica*

May 23, 2016

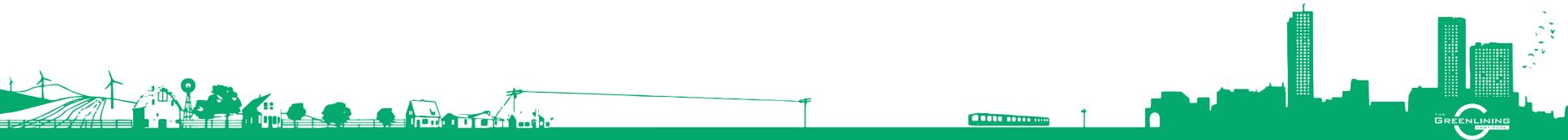
# SOLUTIONS

## Short Term

- Inventory of high-impact ADS in government
- Risk Assessments
- Testing for Disparate Impacts
- Disclosures
- Capacity building at oversight bodies

## Medium/Long Term

- Audits
- Create regulatory guidance and red lines
- Update civil rights protections to cover unique algorithmic harms
- Algorithmic 'Greenlining'



# ALGORITHMIC GREENLINING

“Big Data processes codify the past. They do not invent the future. Doing that requires moral imagination, and that’s something only humans can provide. We have to explicitly embed better values into our algorithms, creating Big Data models that follow our ethical lead. Sometimes that will mean putting fairness ahead of profit.”

—Cathy O’Neil, author, “Weapons of Math Destruction”

## CalEnviroScreen Equity Indicators

### Pollution Burden

#### Exposures

- Ozone • PM2.5 • Traffic • Toxic Release from Facilities
- Pesticide Use • Diesel PM • Drinking Water Contaminants

#### Environmental Effects

- Solid Waste Sites and Facilities • Cleanup Sites
- Groundwater Threats • Impaired Water Bodies
- Hazardous Waste Generators and Facilities

### Population Characteristics

#### Sensitive Populations

- Asthma • Cardiovascular Disease
- Low Birth-Weight Infants

#### Socioeconomic Factors

- Poverty • Educational Attainment
- Unemployment • Linguistic Isolation
- Housing Burdened Low Income Households

CalEnviroScreen

### Pollution Burden

Average of Exposures and Environmental Effects



### Population Characteristics

Average of Sensitive Populations and Socioeconomic Factors



CalEnviroScreen Score

