



# Facial Recognition

## **Fun Fact:**

If you're an adult in the U.S., there's a 50 percent chance your photo is stored in a police database somewhere, even if you've never been arrested or charged with a crime.

# Headlines

**The ethical questions that haunt facial-recognition research**

One Month, 500,000 Face Scans:  
How China Is Using A.I. to Profile a  
Minority

**Amazon's Face Recognition Falsely Matched 28  
Members of Congress With Mugshots**

**'I was shocked it was so easy': meet  
the professor who says facial  
recognition can tell if you're gay**

**The new lawsuit that shows facial  
recognition is officially a civil rights issue**

Robert Williams, who was wrongfully arrested because of a faulty facial recognition match, is asking for the technology to be banned.



# Facial Recognition

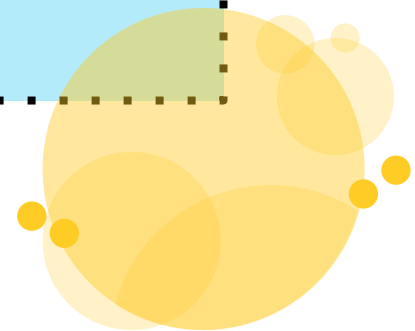
*Is it Ethical?*

*Do the benefits outweigh the misuses of it?*



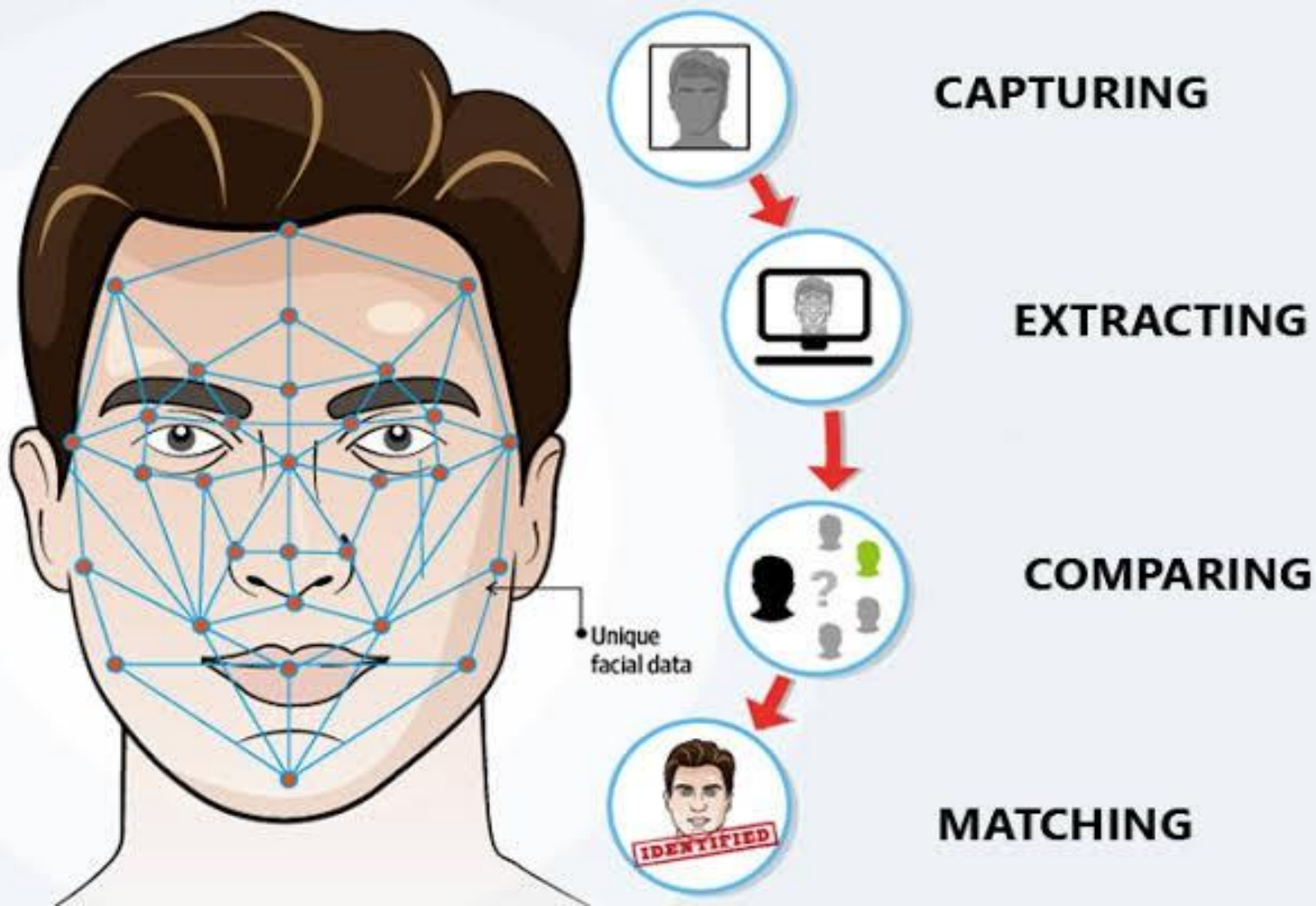
# Facial Recognition Systems (FRS)

- Work different but often built on algorithms that analyze images of human faces for the purpose of identifying them.
- FRS use computer algorithms to pick out specific, distinctive details about a person's face.
- A method of biometric identification

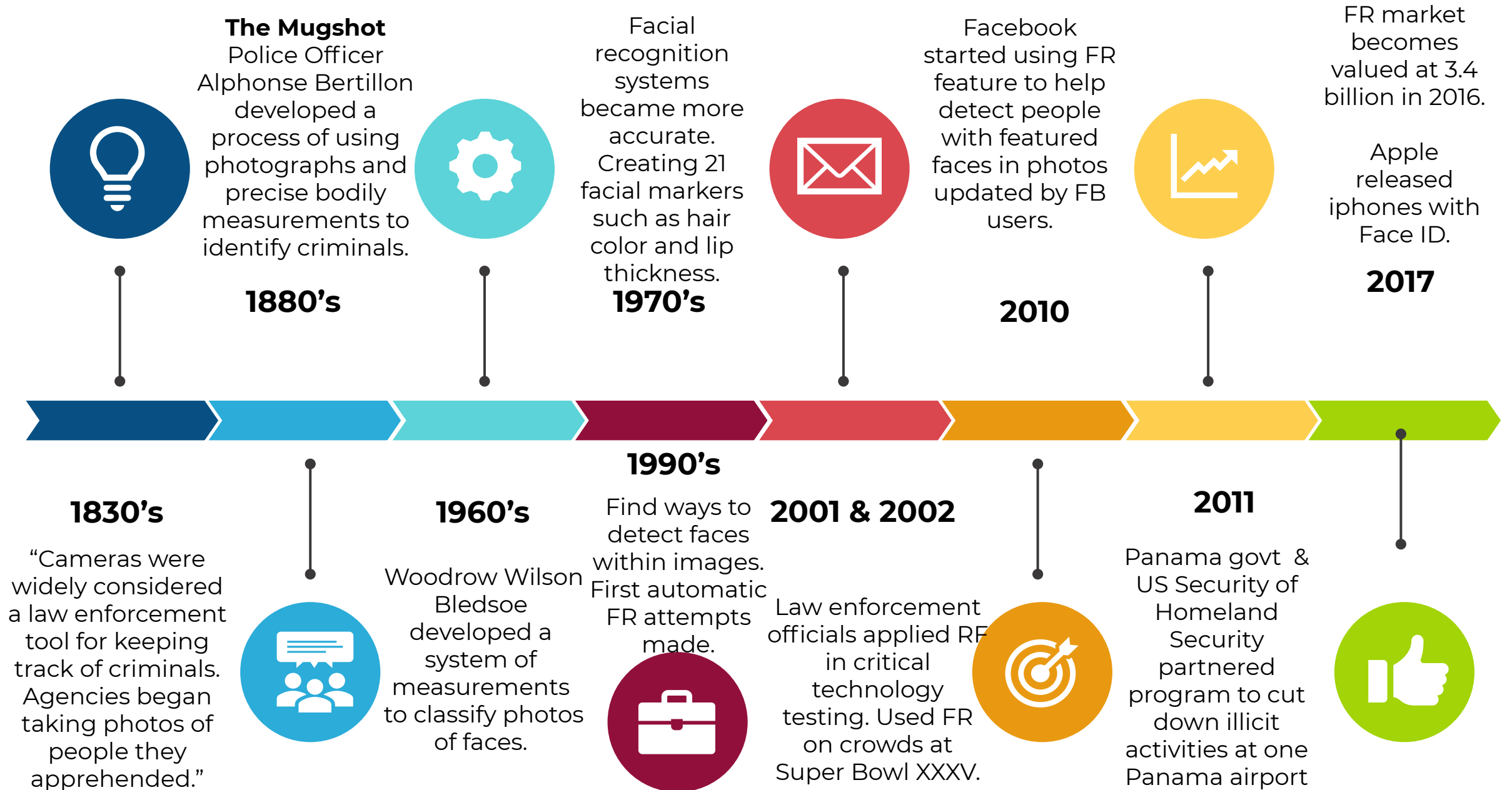


# How it Works:

## Biometrics Face Recognition - How does it Work?



# History



# To Note:

01

FR Systems vary in their ability to identify people under challenging conditions such as poor lighting, low quality image resolution, and suboptimal angle of view (such as in a photograph taken from above looking down on an unknown person).



02

False  
Negative

**When the FRS fails to match a person's face to an image contained in a database. (Return zero results)**



03

False  
Positive

When the FRS does match a person's face to an image in a database, but that match is actually incorrect.  
(The FRS tells the officer that the photo is of "Joe.")



Phone  
attempts



Pros



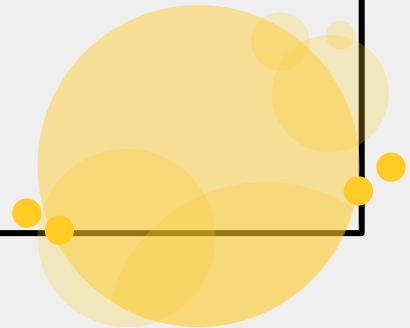
## Widespread Adoption: Used By...

### Consumers:

- Authentication
- Assistive Technology for visually impaired
- Social Media photo tagging
- Photo album management
- Find lost pets
- Projected 9 billion dollar business by 2022.

### Businesses:

- Law enforcement surveillance
- Forensics
- Airport passenger screening
- Employment screening
- Housing screening
- Medical Diagnosis
- Projected 9 billion dollar business by 2022.






# Cons

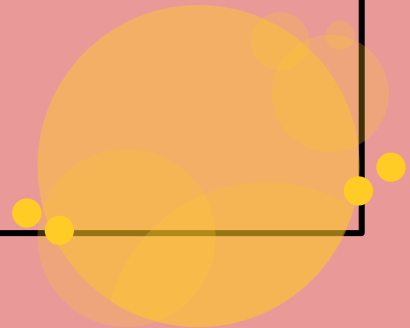
*“The belief that crime can be defeated through technological means propels innovations in the field ever onward”*

*“Most emerging identification technologies were also considered invasive, prompting similar privacy concerns. But ultimately, most of those technologies were accepted as necessary tools for security.”*

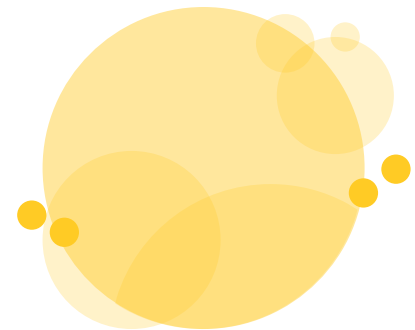


# Cons

- Targeted surveillance and discrimination
  - BLM protest surveillance
  - China searching for Uyghur ethnic minorities
  - Crime surveillance in Black neighborhoods
  - Undocumented immigrants/ICE
- Misidentification leads to false arrests
  - FR much less accurate for PoC and women
- Perpetuates existing human bias
  - Pinpoints PoC as likely criminals
- Lack of consent
- Threatens basic rights such as freedom of speech, protest



“Face recognition systems vary in their ability to identify people under challenging conditions such as poor lighting, low quality image resolution, and suboptimal angle of view (such as in a photograph taken from above looking down on an unknown person).”



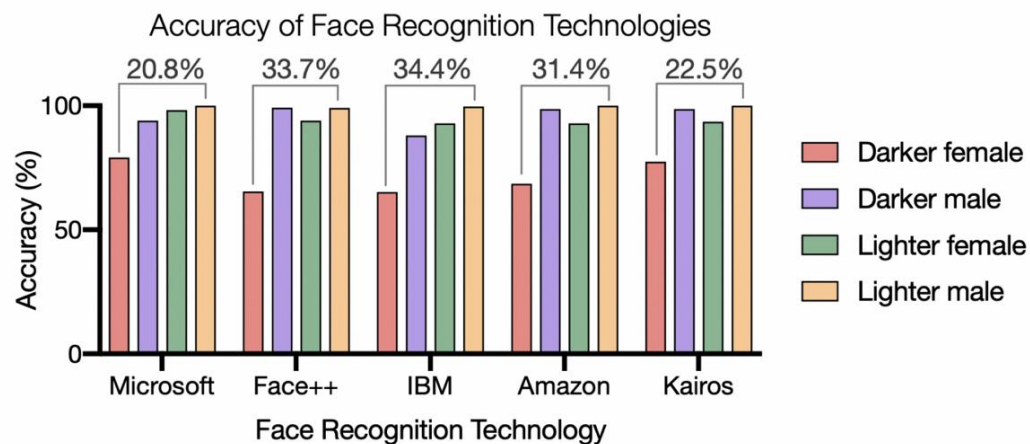


Figure 1: Auditing five face recognition technologies. The **Gender Shades project** revealed **discrepancies** in the classification accuracy of face recognition technologies for different skin tones and sexes. These algorithms consistently demonstrated the poorest accuracy for darker-skinned females and the highest for lighter-skinned males.

## Project Green Light Detroit

## 2010 Census Data

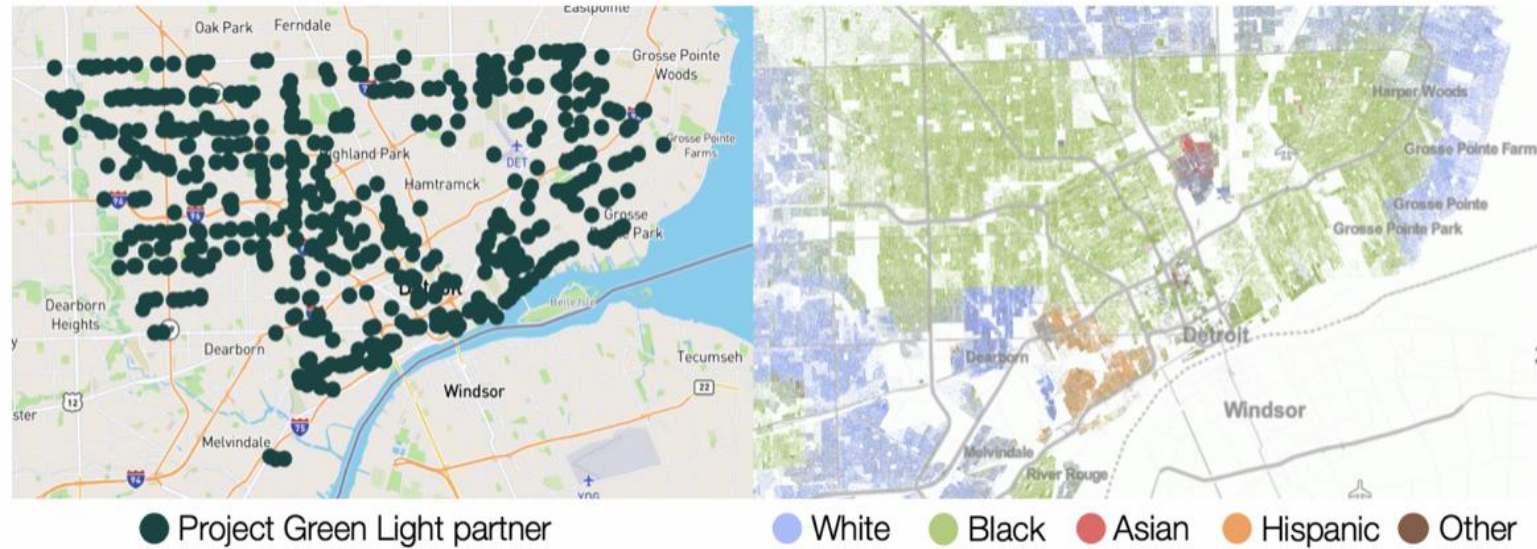
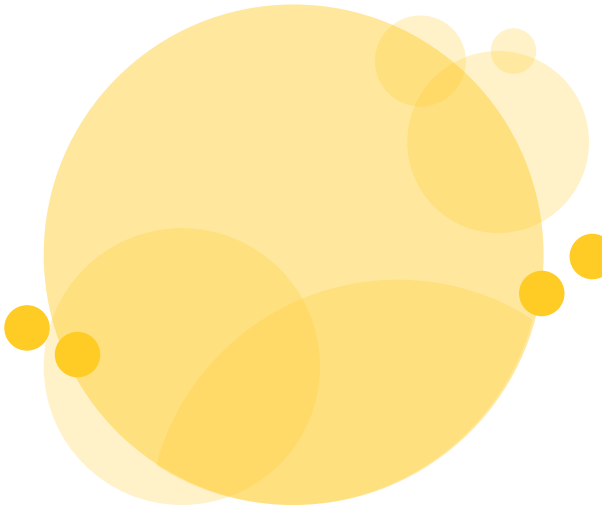


Figure 2: Racial bias in the application of face recognition technology. Locations of **Project Green Light Detroit partners** (left) overlap with primarily Black communities in data from the **U.S. census** (right). In this city-wide program, the brunt of the surveillance falls on Detroit's Black residents.



# Accountability

Companies that provide these services have a responsibility to ensure that they are equitable – both in their technologies and in their applications.



## Current Changes

- Police reform bill containing stipulations to restrain the use of FR tech
- FTC (Federal Trade Commission) enacts obligations to assess algorithmic training, accuracy, and data privacy.  
Thanks to the 2019 Algorithmic Accountability Act
- Transparency & Accountability: Safe Guard Pledge calls for companies to address their biases and evaluation application.
- IBM discontinued their program
- Amazon froze their police use of *Rekognition* for one year
- Microsoft halted sales of FR technology until federal regulations are instituted.



# How do we improve? Progressive Steps:

## 1. Algorithmic Performance

- Target technical algorithmic performance
- Require consent by each individual in database.

## 2. Equity

- Make data sources (photos) more equitable (default camera is not optimized to capture darker skin tones) resulting in lower quality data base images of Black Americans.
- Establish standard of image quality
- Establish standard of settings for photographing Black Americans.
- Equitable criminal justice system

## 3. Access Performance

- Implement regular and ethical auditing from independent sources to reduce methodological biases. (Accountability)
- Progressive Legislation implementation required
- Regulate company policies
- Fund companies designated with FR equity goals.
- Police Reform Bill now contains



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Slide 6

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