



Hong Qu

NETS 7341
Network
Economics

Should Facial Recognition Technology (FRT) be Used by Law Enforcement?

December 15, 2021

Historical and legal context

Constitutional Amendments:

- 1st Freedom of assembly and petition
- 4th No unreasonable searches
- 14th Equal protection and due process
- Peel: community policing with consent

Overview

Biometric Information Network

Search and identification at scale

Surveillance shifts power and norms

Inaccurate at matching minority faces

Model for Weighing the Benefits and Harms

What should city council members consider when voting for or against FRT?

Opportunity cost to social programs

Public Safety

“Facial recognition technology can provide a uniquely powerful tool in our most challenging investigations: when a stranger suddenly commits a violent act on the street.”

“It would be an injustice to the people we serve if we policed our 21st-century city without using 21st-century technology.”

James O’Neill, NYPD Commissioner

How Facial Recognition Makes You Safer

Used properly, the software effectively identifies crime suspects without violating rights.

June 9, 2019



Erik Carter



By James O’Neill

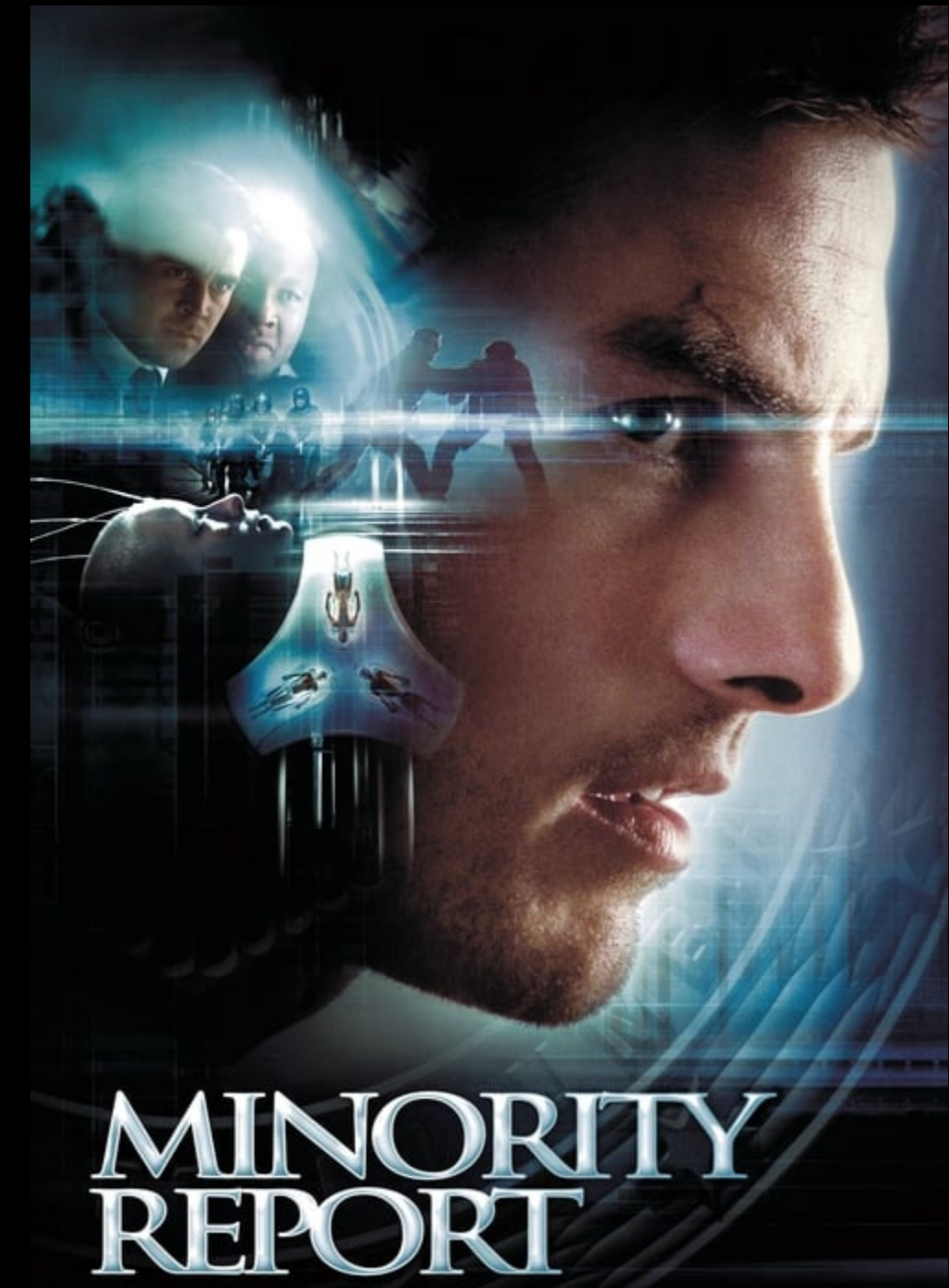
Mr. O’Neill is the New York police commissioner.

Police Dystopia

2028 (6 years)



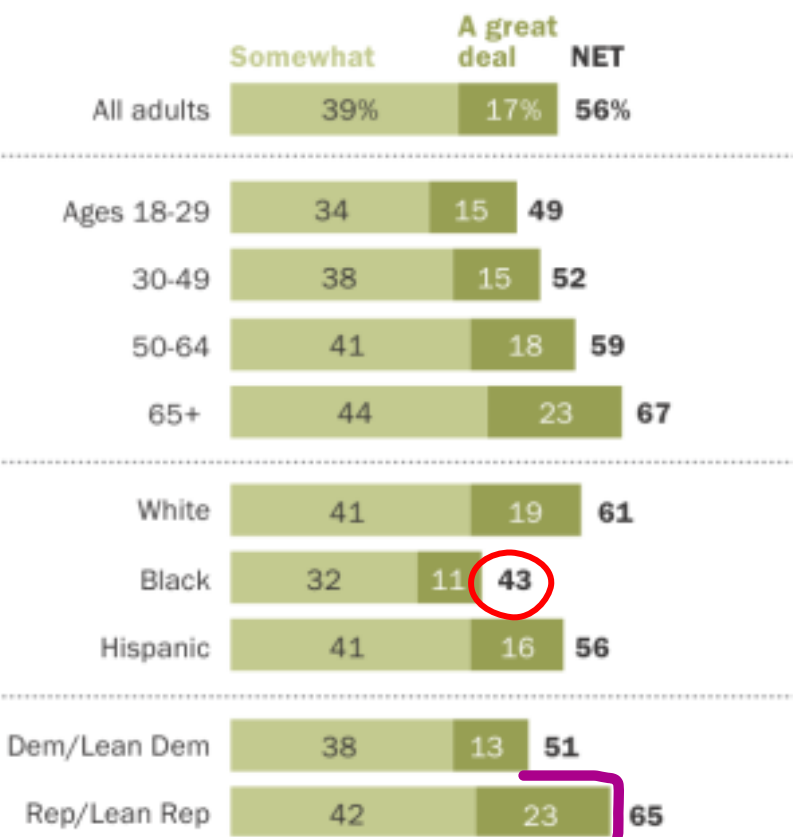
2054 (32 years)



Public opinion

Older U.S. adults, whites, Republicans more trusting of facial recognition use by law enforcement

% in each group who say they trust law enforcement agencies ____ to use facial recognition technology responsibly

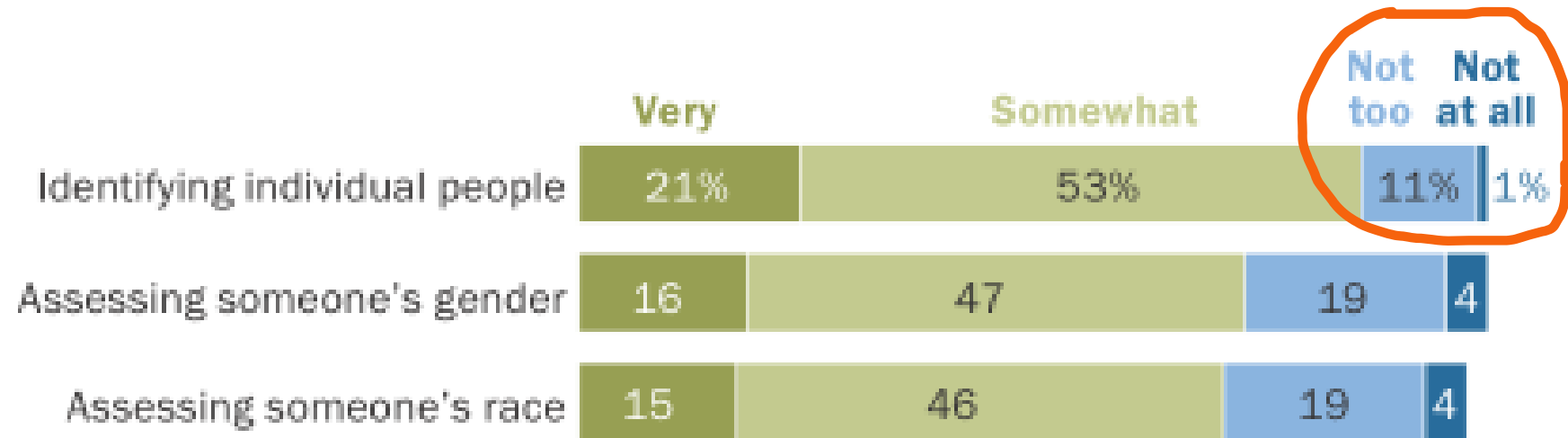


Note: Respondents who gave other answers are not shown. Whites and blacks include only non-Hispanics. Hispanics are of any race.
Source: Survey of U.S. adults conducted June 3-17, 2019.
"More Than Half of U.S. Adults Trust Law Enforcement to Use Facial Recognition Responsibly"

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Majorities believe facial recognition is effective at identifying individuals, assessing gender and race

% of U.S. adults who say facial recognition technology is ____ effective at accurately ...



Note: Results do not add to 100% because the 13% of U.S. adults who have not heard of facial recognition technology are not shown.

Source: Survey of U.S. adults conducted June 3-17, 2019.

"More Than Half of U.S. Adults Trust Law Enforcement to Use Facial Recognition Responsibly"

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Technical Reliability

Using the higher quality Application photos, **false positive rates are highest in West and East African and East Asian people**, and lowest in Eastern European individuals. This effect is generally large, with a factor of 100 more false positives between countries.

We found false positives to be **higher in women** than men, and this is consistent across algorithms and datasets.

National Institute of Standards and Technology

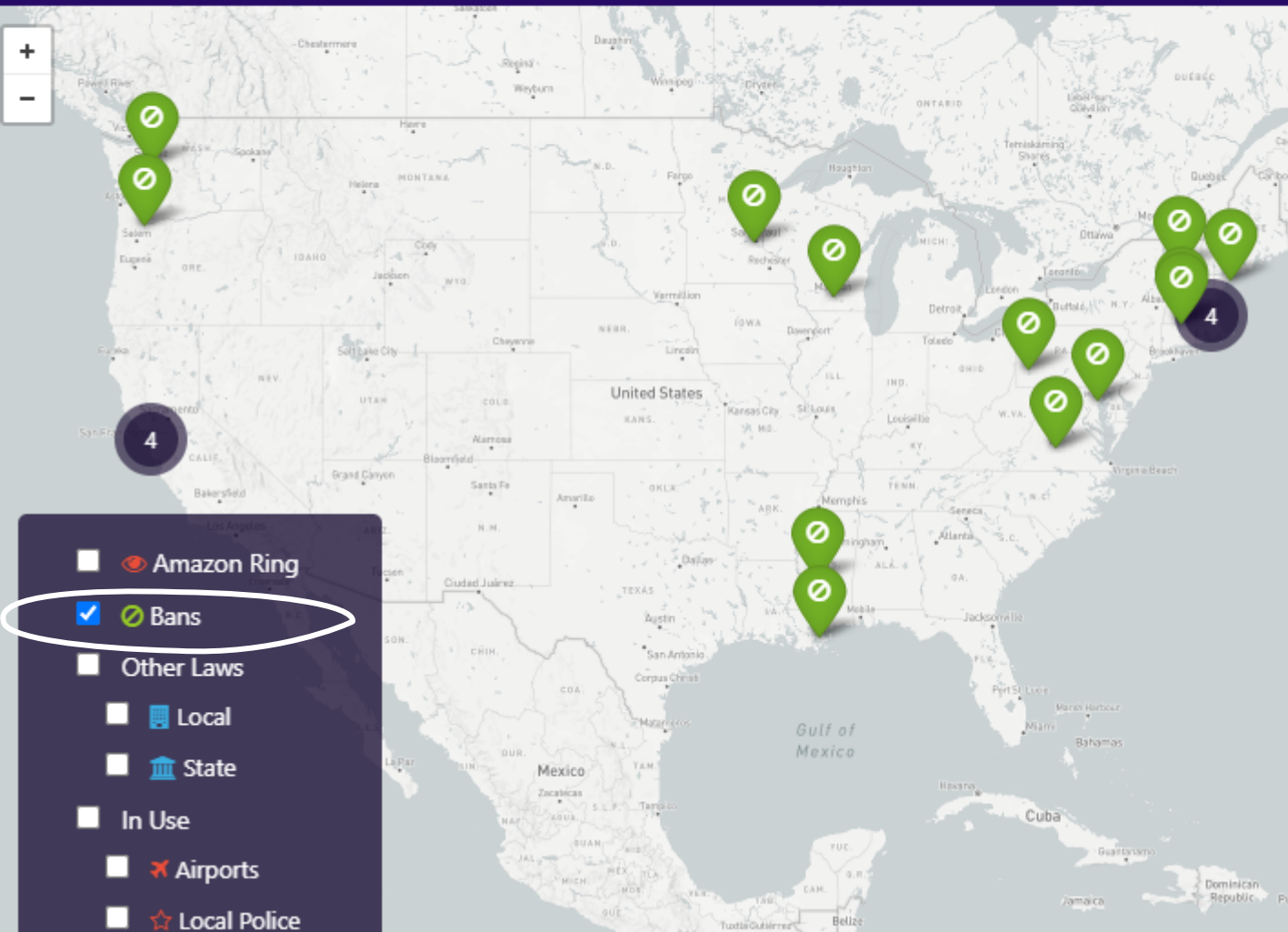
[Face Recognition Vendor Test \(FRVT\) Part 3: Demographic Effects](#)

Where is facial recognition technology deployed and banned?

BAN FACIAL RECOGNITION

[JOIN A LOCAL EFFORT](#)[SIGN THE PETITION](#)[DONATE](#)

This interactive map shows where facial recognition surveillance is happening, where it's spreading to next, and where there are local and state efforts to rein it in. See something missing? Contact us: team@fightforthefuture.org



ALAMEDA FACIAL RECOGNITION BAN

Alameda, CA

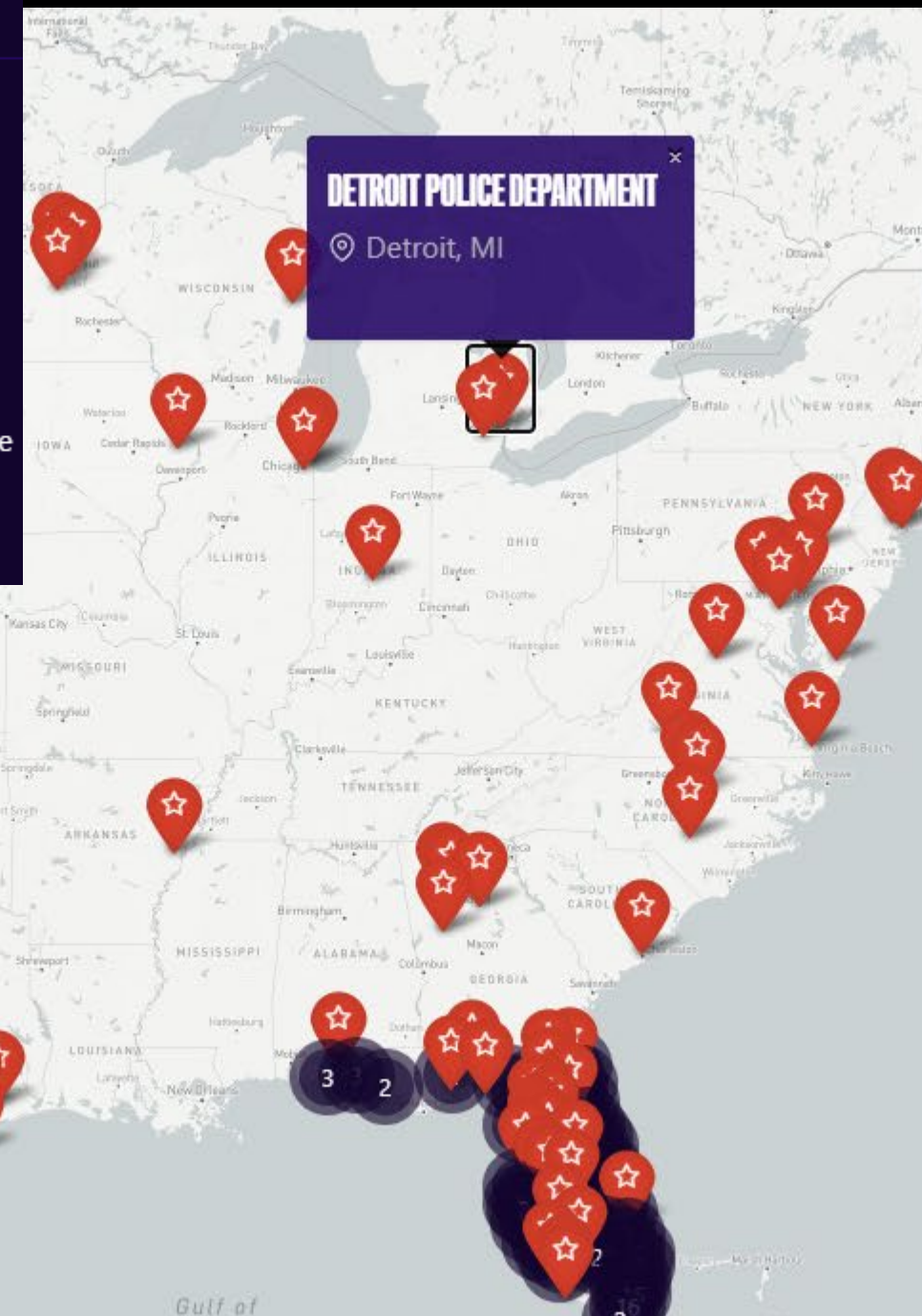
On December 17th, 2019, the Alameda City Council unanimously passed a measure to ban the use of facial recognition technology.

BALTIMORE CITY FACIAL RECOGNITION BAN

Baltimore City, MD

Baltimore City Council passed an ordinance barring the use of facial recognition technology by city residents, businesses, and most of the city government (excluding the city police department), which went into effect September 1, 2021.

<https://www.banfacialrecognition.com/map/>



DETROIT POLICE DEPARTMENT

Detroit, MI

The Detroit Police Department signed a contract with DataWorks Plus for real-time face recognition in 2017. The contract was renewed in September 2020.

DORAL POLICE DEPARTMENT

Doral, FL

The Doral Police Department is one of more than 275 law enforcement agencies with access to the Face Analysis Comparison & Examination System (FACES), a face recognition program maintained by the Pinellas County Sheriff's Office. Investigators may upload an image to search more than 25-million Florida driver's license photos and mugshots.

DURHAM POLICE DEPARTMENT

Durham, NC

In 2017, the Durham Police Department bought six mobile face recognition systems for \$38,400.

EATONVILLE POLICE DEPARTMENT

Eatonville, FL

Detroit Project Greenlight



Project Green Light creates a "civil liberties nightmare by placing everyone under constant surveillance," while also focusing resources on the wrong things.

- Jonathan Smith, former chief of the Special Litigation Section at the U.S. Department of Justice's Civil Rights Division

Detroit Project Greenlight

Project Green Light Map

Enter your address

**Welcome to the City of Detroit
Project Green Light Map**

This project is the first public-private-community partnership of its kind, blending a mix of real-time crime-fighting and community policing aimed at improving neighborhood safety, promoting the revitalization and growth of local businesses, and strengthening DPD's efforts to deter, identify, and solve crime.

START

PLANNING AND DEPLOYMENT
TRANSMITTAL OF WRITTEN DIRECTIVE

FOR SIGNATURE OF: James E. Craig, Chief of Police



TYPE OF DIRECTIVE: Manual Directive 307.5

SUBJECT: FACIAL RECOGNITION

ORIGINATED OR REQUESTED BY: Planning, Research and Deployment

APPROVALS OR COMMENTS:

The above referenced directive is updated to reflect the Board of Police Commissioners and internal review.

APPROVED
JUL 25 2019
SECOND DEPUTY CHIEF
POLICE LEGAL ADVISOR

https://detroitmi.gov/sites/detroitmi.localhost/files/2019-07/FACIAL%20RECOGNITION%20Directive%20307.5_0.pdf

<https://detroitmi.gov/departments/police-department/project-green-light-detroit>



Civil Liberties

FACIAL RECOGNITION

307.5 - 1 PURPOSE

The purpose of this policy is to establish acceptable use for the Detroit Police Department's (DPD) facial recognition software.

307.5 - 2 Prohibited Uses

307.5 - 2.1 Surveillance

Members shall not use facial recognition software to surveil the public through any camera or video device.

307.5 - 2.2 Live Streaming or Recorded Videos

Members shall not use facial recognition software on live stream or on recorded videos. This prohibition applies to all videos, whether they originate from DPD itself, from private citizens, or from any other source.

307.5 - 2.3 First Amendment Events

The Detroit Police Department will not violate First, Fourth, and Fourteenth Amendments and will not perform or request facial recognition searches about individuals or organizations based solely on the following:

307.5 - 4.2 Criminal Investigation Required

Members shall not use facial recognition technology unless that technology is in support of an active or ongoing Part 1 Violent Crime investigation (e.g. robbery, sexual assault, or homicide) or a Home Invasion 1 investigation.

307.5 - 4.3 Individualized Targeting

Members shall not use facial recognition technology on any person unless there is reasonable suspicion that such use of facial recognition technology will provide information relevant to an active or ongoing Part 1 Violent Crime investigation or a Home Invasion I investigation.



MICHIGAN STATE POLICE STATEWIDE NETWORK OF AGENCY PHOTOS (SNAP) ACCEPTABLE USE POLICY

I. Purpose

The purpose of this policy is to establish procedures for acceptable use of the images, information, and tools within the Statewide Network of Agency Photos (SNAP) application.

II. Definitions

- A. "Biometric data" is data derived from one or more intrinsic physical or behavioral traits of humans, to include fingerprints, palm prints, iris scans, and facial recognition data.
- B. "Facial recognition (FR)" is the automated searching of a facial image in a biometric database (one-to-many), typically resulting in a group of facial images ranked by computer-evaluated similarity.

https://www.michigan.gov/msp/0,4643,7-123-72297_64747_64749-357133--,00.html

https://www.michigan.gov/documents/msp/SNAP_Acceptable_Use_Policy_2016_03_07_533938_7.pdf

Due Process

VI. Facial Recognition (FR)

- A. FR is not a form of positive identification and results shall be considered an investigative lead only.
- B. FR shall only be used for a law enforcement purpose authorized by law.
- C. It is recommended per the Facial Identification Scientific Working Group (FISWG) and the Organization of Scientific Area Committees (OSAC) for Forensic Science, only trained facial examiners should conduct FR searches.
- E. Mobile FR shall only be used during the course of a User's lawful duties and one of the following circumstances exists:
 - i. Mobile FR may be used with consent of an individual:
 - 1. The individual may withdraw consent at any time. If consent is withdrawn, and the use of Mobile FR is solely based upon consent, use of Mobile FR is not authorized and its use must stop immediately.
 - ii. Mobile FR may be used without consent of an individual if one of the following circumstances exists:
 - 1. The User has probable cause to believe the individual has committed a crime for which the collection of biometric data is allowable under [MCL 28.243](#).
 - 2. The individual is unable to provide reliable identification due to physical incapacitation or defect, mental incapacitation or defect, or death, and immediate identification is needed to assist the User in performance of his or her lawful duties.
- G. Select Users may be configured to receive MDOS images in Mobile FR results. Users with access to MDOS images in Mobile FR results shall adhere to the following:
 - i. Pre-existing images, including, but not limited to, social media photos and surveillance stills, shall not be submitted through Mobile FR. Failure to comply will result in the User's access to MDOS images in Mobile FR results being terminated.



“...it really just feels like you have eyes on you at all, like 24-7. No matter what you do, someone’s watching you.”

Privacy concerns still loom over Detroit's Project Green Light

“...essentially taking money out of the community and giving it to these vendors”

Does Detroit's Project Green Light really make the city safer?

“I am trying to be neutral in that I’ve heard mostly good things about it, but at the same time, I have not seen any direct evidence of its effectiveness, only anecdotal information that we’ve heard from sources with a vested interest in it,”

Detroit City Council approves \$4 million for Real Time Crime Center

“No, this is not me, you think all black men look alike?”

Robert Julian-Borchak Williams



Wrongfully Accused by an Algorithm

Criteria for Fair and Accountable FRS



Technical Reliability
Fairness to Minorities



Privacy and Consent



Due Process



Community
Oversight

Model of how City Council Vote

Technical Reliability

.99 - [Political leaning adjustment]

Privacy and Consent

IF Dem: Privacy and Consent
parameter] < .90

IF Rep: Privacy and Consent
parameter] < .70

Fairness to Minorities

.95 - [Tolerance for Bias to Minorities
(Dem/Rep)]

- [Political leaning adjustment]

Due Process

IF Dem: .90 - [Political leaning
adjustment]

IF Rep: .70 - [Political leaning
adjustment]

Tolerance for Bias

0 < [Tolerance for Bias to Minorities
(Dem/Rep)] < .1

Community Oversight

IF Dem: [Community Oversight
parameter] != TRUE
THEN "Ban"

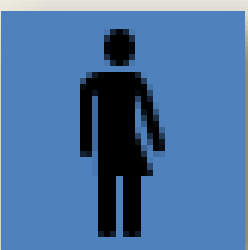
Political Leaning: Republican - Democrat

0.00 10.00

Republican



Democrat



Political Leaning = 7

Pol. Leaning Adj = .07

Political Leaning = 2

Pol. Leaning Adj = .02

Due Process threshold

.70 - .07 = .63

Due Process threshold

.90 - .02 = .88

Fairness threshold

IF Rep tolerance = .03

.95 - .03 - .07 = .85

Fairness threshold

IF Dem tolerance = .01

.95 - .01 - .02 = .93

Privacy threshold

IF Privacy < .70

THEN "Ban"

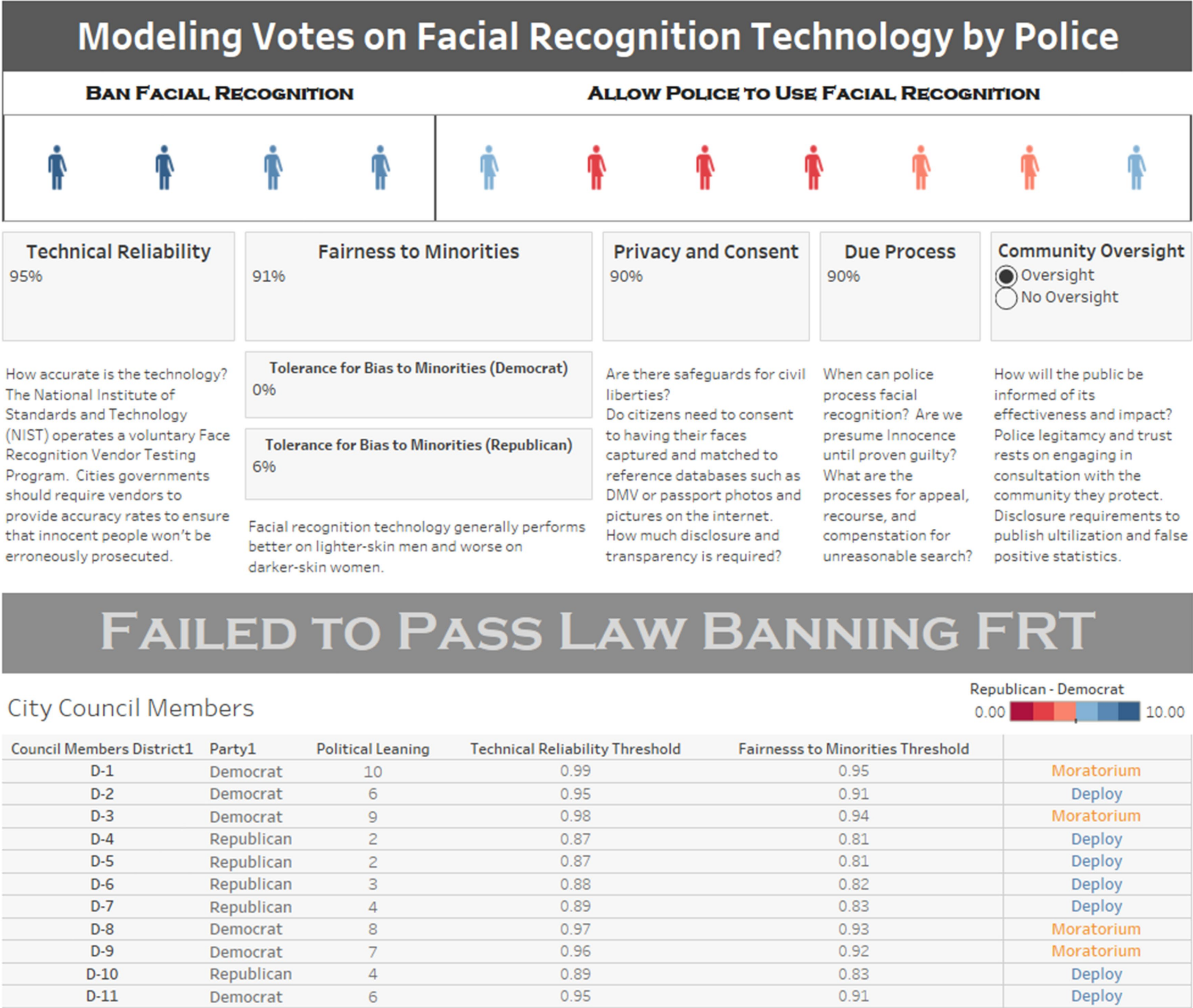
Privacy threshold

IF Privacy < .90

THEN "Ban"

Simulation of City Council Vote

Live Demo





Lawsuit: Man suffered 'great harm' after wrongful arrest based on Detroit's facial recognition technology

"Facial recognition was used, but that's not why the arrest was bad," said Craig. He added that the mistake was caused by "sloppy work and lack of management oversight."
- Detroit Police Commissioner

"prohibiting Defendants from using facial recognition technology as an investigative technique so long as it misidentifies individuals at materially different rates depending on race, ethnicity, or skin tone."
- ACLU Lawsuit

- compensation for **unlawful and humiliating arrest and imprisonment**, punitive damages
- declaratory and injunctive relief to prevent similar **unconstitutional** arrests in the future

Purpose

Peel's Principles

“Police’s effectiveness is not measured on the number of arrests, but on the lack of crime.”



To Ban?

Or not to Ban?

Vote Ban

Ban Facial Recognition?

Yes, ban! The technology discriminates and will be abused in the field.

Violations of existing civil rights laws and civil liberties will be inevitable.

Who benefits?

Who is harmed?

Impact assessment studies

Who is made safer and at what cost?

Recourse for people wrongfully accused

Appendix



**POLICE CHIEF CRAIG
AND MAYOR DUGGAN:**

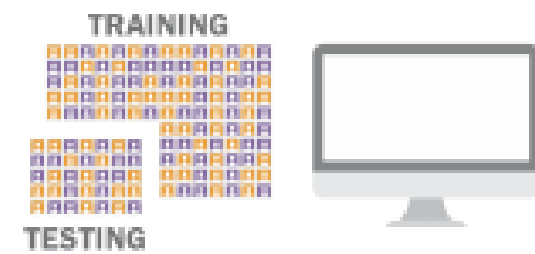
**HOLD DETRIOT PD
ACCOUNTABLE FOR
THEIR VIOLENCE.**

TEXT “DETROIT” TO 55156



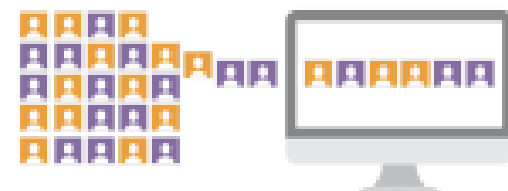
How does FRT work?

Training a machine learning system to identify men and women in digital images



Setting up

Researchers began with an untrained software system and a collection of images of faces that human coders labeled by gender. Some of the images were used to train the system, and some were set aside to later test the system and evaluate its ability to identify gender.



Training

Researchers then showed the system the labeled training set of images, allowing it to develop its own rules for identifying images of men and women.



Testing

Once the system was trained, researchers showed it the testing set of images, but with the human-coded labels hidden. The system then labeled each image as male or female. To evaluate the system's performance, researchers compared the system's decisions to those of the human coders.

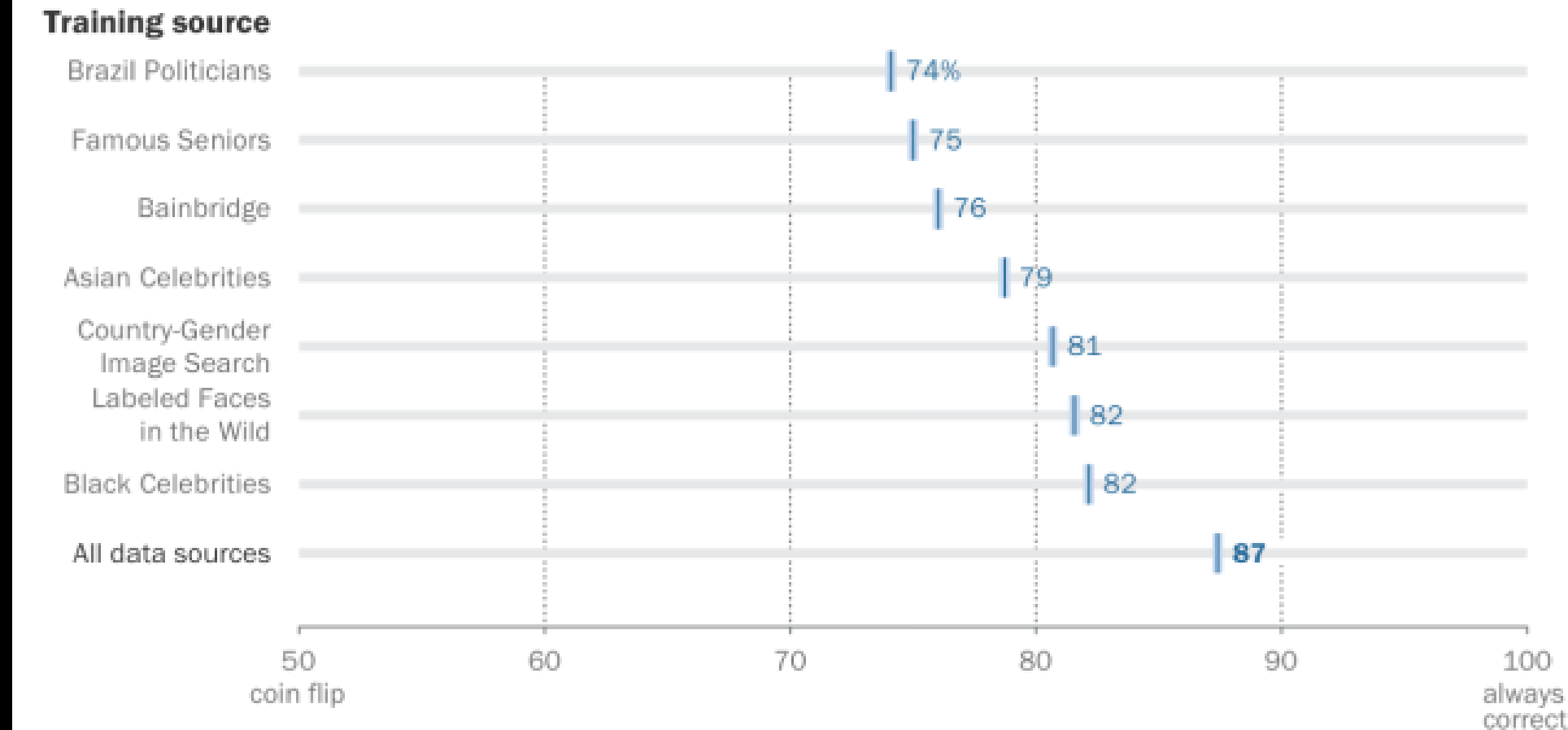


"The Challenges of Using Machine Learning to Identify Gender in Images"

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Machine learning models trained on multiple data sources were more accurate than those trained on a single data source

Estimated accuracy of machine learning models trained using data from ...



Source: Pew Research Center analysis of image classification models.

Note: The dark blue line shows estimated performance for each model. Light blue bars show the standard error surrounding each prediction.

"The Challenges of Using Machine Learning to Identify Gender in Images"

PEW RESEARCH CENTER

A.I. Blindspot

How might harm happen? We have translated key concepts around this question into a series of illustrated scenarios, or "blindspots." They show how each might play out if AL was a person.

