CS 4873:
Computing, Society & Professionalism

Blair MacIntyre | Professor | School of Interactive Computing

Week 14: Race and Computing

April 19, 2021

Slides adapted from Sauvik Das and Amy Bruckman

Overview of Lecture

- Sauvik Das' lecture from last semester

- Add a bit more readings
  - He used the "Does Technology have Race?" and "Crypto for the People" readings (video)
  - Added "What's the difference between race and ethicity?" and "Nextdoor has a racism problem" readings

Sauvik Das | Assistant Professor

Race & Computing

October 1st, 2020

Context

- This is a required class that has been offered for over a decade (at least since I was a freshman in 2006, but probably for a long time before that as well).

- Traditionally, the topic of race & computing has not been covered in this class.

- Why?

  - Rational arguments require:

    - Shared assumptions about where to start

    - Reasonable participants who are open to changing their minds

  - Not easy to have rational arguments about "race" in a 50-80 minute class; requires significant background to get to shared assumptions.

- So what changed?

Issues of race in society are front and center in this country

- Death of George Floyd and the mass protests and civil unrest that ensued in its aftermath

- Does this have anything to do with computing?
  - Social media facilitated "viral black death" has shined a spotlight on police brutality, particularly on Black folks
  - In other words, the role of computing is undeniable in the conversations we are having about race in society today

- But the closer you look, the deeper the connection.

- Worth examining why it took viral black death and a widespread civil unrest before we decided to integrate this section into the curriculum of this class.

Disclaimer

- I'm figuring this out too; conceptions of and assumptions about race are embedded into the pipeline of computing.

- Will take a lot to unpack and disentangle.

- Impossible to do in 50 minutes.

- The objective here is to show you that computing is not divorced from the prevailing issues of our society and that as much as we like to print("Hello world."), we and our work are not exempt from uncomfortable social realities.
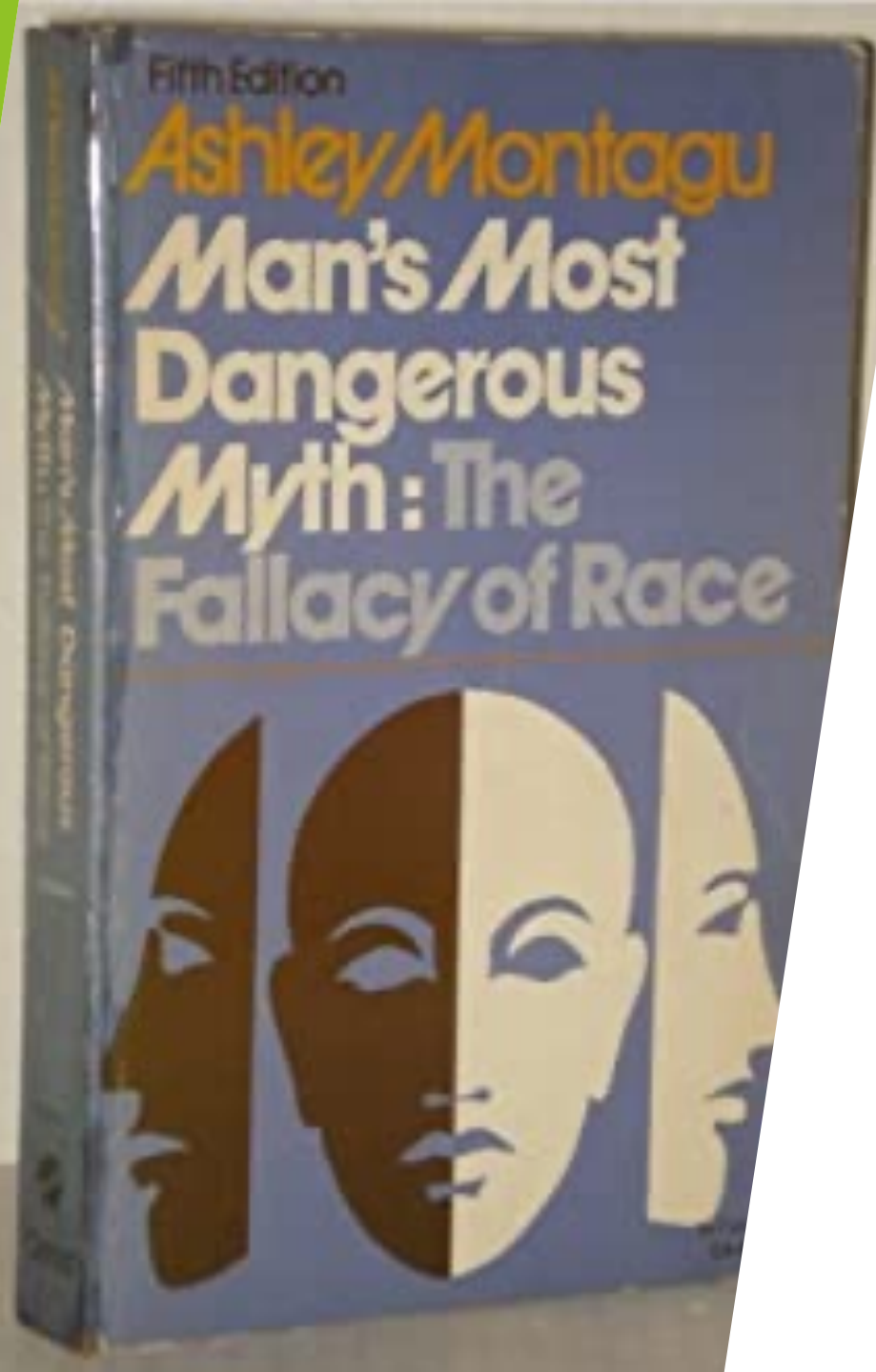
Race

Poll: What race do you identify as?

▶ Bluejeans polls doesn't allow for multi-selection, so you can pick "multiple / mixed" if you identify as more than one.

▶ Was it easy for you to answer that question?

▶ Categories taken from U.S. Census.

Let's start with some shared assumptions

- Need to be clear about what we mean by race before anything else makes sense.

- Can't change whether or not you or I are reasonable about this topic ☺

Fifth Edition
Ashley Montagu
Man's Most Dangerous Myth: The Fallacy of Race

Is Race Real?

▶ In 1945, anthropologist Ashley Montagu discredited the idea of "biological" race in his book: "Man's Most Dangerous Myth"

▶ In other words, from a biological perspective there is only one "race" — the human race.

▶ There are no biologically or genetically meaningful differences between people with black skin, brown skin or white skin.

- Dawkins and "taxonomic significance"

- "Race is folk taxonomy, not science. The variables used to organize it, such as skin color and hair texture, are arbitrary choices."

- "Living humans share too recent a common ancestor for there to be many deep-seated biological differences among us. From an evolutionary standpoint, we are all Africans."

John Shea, anthropologist circa now

But…diseases! And skin color is genetic, right?

- Correlation, not causation.

- These things are tied to *geographic ancestry*. Take a small group of white people, isolate them in modern-day Africa for a few millennia, and they will have different disease vulnerability and skin tone than their ancestors.

- But that does not mean they will be meaningfully genetically distinct from their ancestors from an evolutionary standpoint.

The upshot?

- It's a fallacy to think that one racial group is superior or inferior than another in things like:
  - Intelligence
  - Athletic ability
  - Computing skill

- Measured differences in these attributes are correlational. Worth unpacking the data to understand underlying assumptions and biases.
  - e.g., "Jamaicans run really fast" -> maybe, but that's not because of genetic pre-disposition. Sociocultural effects
  - IQ tests, for example, are not objective and measure formal exposure to concepts and words rather than any inherent ability to learn

So…race isn't real?

- No, no. Race is real because **it affects our lived experiences in the world** from a sociocultural perspective.
  - A black or brown immigrant has different lived experiences in society in the U.S. than a white person who was born in the U.S.

- So perspectives like "I don't see race" are also counter-productive. Must acknowledge experiential differences because those are real.
  - Anyway, it's not even true unless you're visually impaired and Kant would like to have a word with you about lying.

- Race is real because the system of our world is set up to make correlational differences between "black" and "brown" and "yellow" and "white" skin salient.

The shared assumptions I will move forward with:

- Biological race is not real.

- If you're not with me on that, then we don't have a shared assumption. You can try to convince me otherwise by showing me:
    - Peer-reviewed scientific research that there are evolutionarily meaningful genetic differences between "races" that are not based on geographic ancestry (hint: there is none)

- Social conceptions and construction of race and how that affects our lives is real.

- If you're not with me on that, then we don't have a shared assumption. You can try to convince me otherwise by showing me:
    - Peer-reviewed scientific research that social and lived experiences of the social race categories we have in the U.S. doesn't affect lived experiences with X, where X is a socially significant aspect of life in the modern-day U.S.

Race & computing

Cross-cutting

- Unlike threads / verticals (e.g., intelligence, embedded computing), race is a cross-cutting topic: it has bearing on things like AI, things like privacy, things like video games that cannot be easily isolated.

- Reflected in the assigned "readings"
  - The first one is a very HCI-centric piece
  - The second is a crypto-centric piece

- The goal of the readings wasn't to get you think specifically about race and diversity in HCI or crypto, but to generalize. Race is embedded in the dynamics of how we approach and design computing systems.

Does technology have race?

Poll: Does technology have race? Why or why not?

Paper written by undergrads in a class a lot like this one

- Many of you took fault with the title — I think the title does a good job in getting readers to critically think about what race means in the context of technology.

- A water faucet isn't white or black, but what does "having" race mean? If it's not biological, but social, the question can be translated: Can technology have socially salient attributes that differentially affects the social races?

- Do artifacts have politics?

- Yes, and yes.

Let's start with the day-to-day experiences

- Sensor calibration and skin tones
- Algorithmic sorting
- Algorithmic detection of faces and facial expressions

- Any one of these things may be a small, honest mistake. "Not a big deal"
- But imagine if everything in your life worked a little bit less well for you?
- Question of dignity.

Systems-thinking

- Race affects computing in larger, systemic ways as well.

- What is "systemic"?
  - broadening perspective beyond immediate cause-and-effect
  - considering the sociotechnical context of a computing system
    - Who created it and why?
    - Who does it benefit?
    - Who bears the costs?
    - Who wields the power conferred by a system? Who is subjugated to it?

Surveillance

- Surveillance sucks for everyone.
- But it sucks most for people who are "different."

- The purpose of surveillance in the U.S. is often motivated as a need for "security"
- Normal is secure, anomalous might be insecure

- How is normal determined? What constitutes abnormal?
  - Historically, "normal" is what the middle-class dominant / majority group of people do.

Religion • Perspective
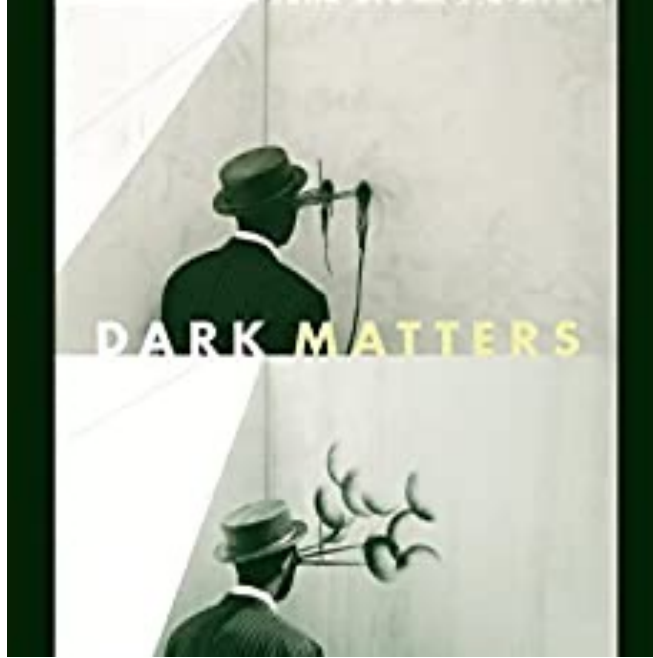
China's alarming AI surveillance of Muslims should wake up

Muslim men arrive at the Id Kah Mosque for the morning prayer on Eid al-Fitr in the old town of Kashgar in China's Xinjiang Uighur Autonomous Region, June 26, 2017. (Johannes Eisele/AFP/Getty Images)

By **Tim Weinhold**

Facial recognition

Cops Arrest Wrong Man In Front Of His Family Based On Flawed Facial Recognition System

June 26, 2020 · Headline Health · 0

Robert Williams was wrongfully arrested when facial recognition technology mistakenly identified him as a suspected shoplifter, he wants Detroit police to apologize — and to end their use of the controversial technology. (Drew English/ACLU via AP)

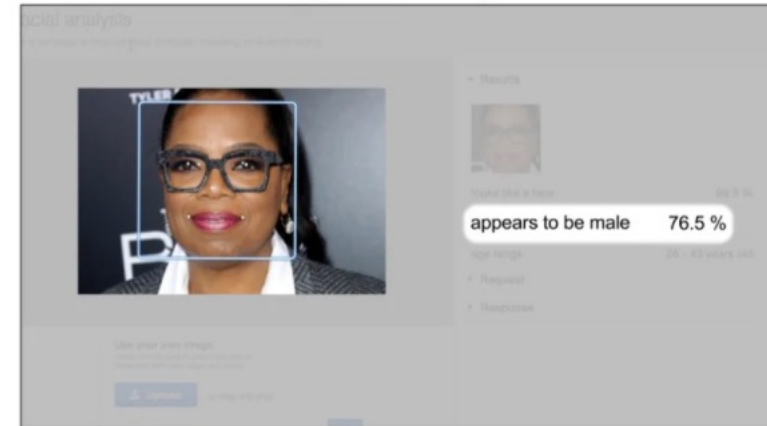**Detroit says 'shoddy' work led to arrest tied to technology |**

Jun 26, 2020 |

By ED WHITE Associated Press

DETROIT (AP) — A Black man who was wrongly arrested after the use of facial recognition technology by Detroit police will have his DNA, fingerprints and mugshot removed from law enforcement files, officials said Friday.
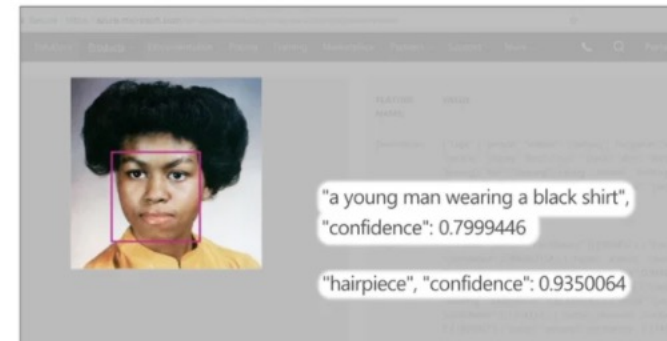
Robert Williams was the victim of "shoddy investigative work," police Chief James Craig said.

Oprah Winfrey

appears to be male   76.5 %

amazon

Michelle Obama

"a young man wearing a black shirt", "confidence": 0.7999446

"hairpiece", "confidence": 0.9350064

Microsoft

The Lyft logo is displayed on a car on March 11, 2019 in San Francisco, California. On-demand transportation company Lyft has filed paperwork for its initial public offering that is expected to value the company at up to $25 billion. (Justin Sullivan/Getty Images)

Uber, Lyft algorithms charged users more for trips to non-white neighborhoods: study

A new study suggests that Uber's and Lyft's algorithms charge higher rates to customers in non-white neighborhoods

👤 **MATTHEW ROZSA**
JUNE 21, 2020 12:00PM (UTC)

A recent study suggests that the algorithm used by popular ride-hailing companies Uber and Lyft may actually discriminate against customers seeking transportation in predominantly non-white neighborhoods.

Aylin Caliskan and Akshat Pandey at George Washington University in Washington DC analyzed transportation and census data in Chicago in a paper that assessed whether there was a racial disparity in how much passengers were charged based on location. Their data set included more than 100 million trips between November 2018 and December 2019, with 68 million of them being made by individual riders.

McKinsey & Company

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The future of work in black America

October 4, 2019 | Article

By Kelemwork Cook, Duwain Pinder, Shelley Stewart, Amaka Uchegbu, and Jason Wright

Research shows that automation trends may be widening the racial wealth gap. This article reveals possible interventions that may help African American workers prepare for the future.

There is a well-documented, persistent, and growing racial wealth gap between African American families and white families in the United States. Studies indicate the median white family in the United States holds more than ten times the wealth of the median African American family.[1]
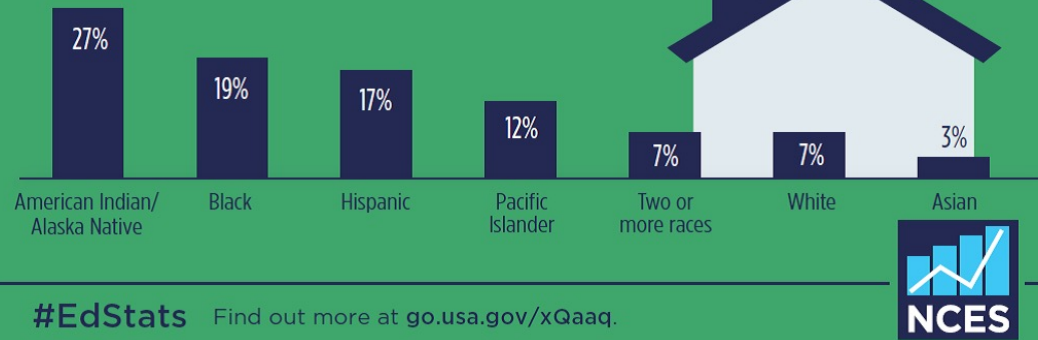
Apart from its obvious negative impact on African American individuals, families, and communities, the racial wealth gap constrains the entire US economy. In a previous report, we projected that closing the racial wealth gap could net the US economy between $1.1 trillion and $1.5 trillion by 2028.

DOWNLOADS
⬇ Article (PDF-707KB)

The Future of Work

Computing education

The percentage of students with either no internet access or only dial-up access at home was highest for American Indian/Alaska Native students.

American Indian/Alaska Native: 27%
Black: 19%
Hispanic: 17%
Pacific Islander: 12%
Two or more races: 7%
White: 7%
Asian: 3%

#EdStats Find out more at go.usa.gov/xQaaq.

NCES

Black & Hispanic students are 1.5x & 1.7x more likely than white students to be very interested in learning CS

Yet...

Black students have less access to CS classes in school

Black & Hispanic students have less exposure to computers

g.co/cseduresearch

Google GALLUP

- ► Predictable inequities in access to computing education

- ► Affects who studies computing and whose voice is represented when we make computing decisions.
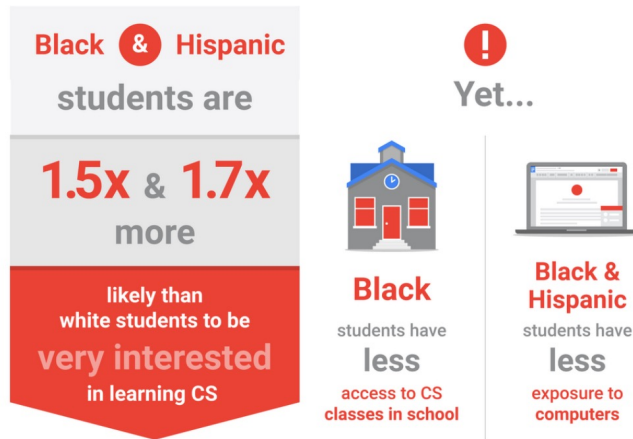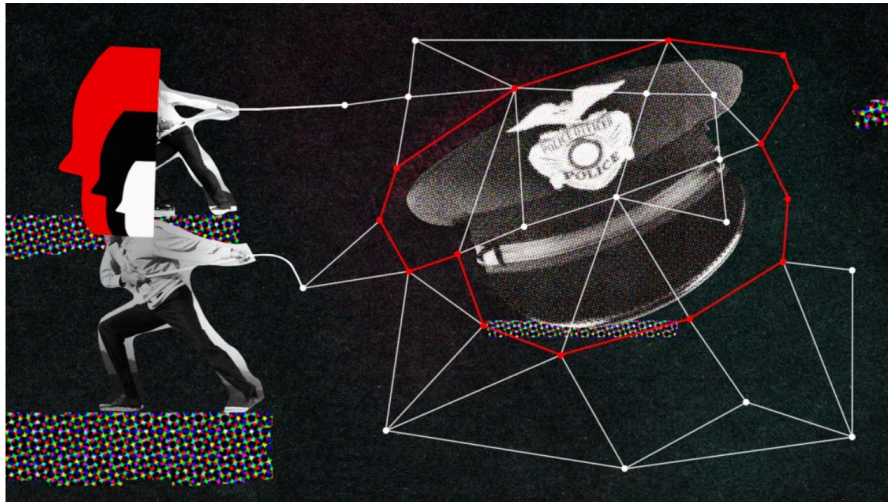
Safety and policing

Predictive policing algorithms are racist. They need to be dismantled.

Predictive Inequity in Object Detection

Benjamin Wilson [1]   Judy Hoffman [1]   Jamie Morgenstern [1]

Abstract

In this work, we investigate whether state-of-the-art object detection systems have *equitable predictive performance* on pedestrians with different skin tones. This work is motivated by many recent examples of ML and vision systems displaying higher error rates for certain demographic groups than others. We annotate an existing large scale dataset which contains pedestrians, BDD100K, with Fitzpatrick skin tones in ranges [1-3] or [4-6]. We then provide an in depth comparative analysis of performance between these two skin tone groupings, finding that neither time of day nor occlusion explain this behavior, suggesting this disparity is not merely the result of pedestrians in the 4-6 range appearing in more difficult scenes for detection. We investigate to what extent time of day, occlusion, and reweighting the supervised loss during training affect this predictive bias.

1. Introduction

a car must brake or swerve to avoid fatalities. The few autonomous vehicle systems already on the road have shown an inability to entirely mitigate risks of pedestrian fatalities (Levin & Wong, 2018). A natural question to ask is *which* pedestrians these systems detect with lower fidelity, and why they display this behavior. In this paper, we study the performance of several models used in state-of-the-art (He et al., 2017) object detection, and show *uniformly poorer performance of these systems when detecting pedestrians with Fitzpatrick skin types between 4 and 6*. This behavior suggests that future errors made by autonomous vehicles may not be evenly distributed across different demographic groups.

We then investigate *why* standard object detection might have higher predictive accuracy for pedestrians lower on the Fitzpatrick scale. The training set has roughly 3.5 times as many examples of lower-Fitzpatrick scored pedestrians compared to higher scored pedestrians, which suggests several different sources of predictive disparity between the two groups might be at work. First, one would expect to have lower generalization error on the larger subset of data. Second, many standard loss functions will prioritize accuracy on the larger subset of the data.

How to be an anti-racist (computing professional)
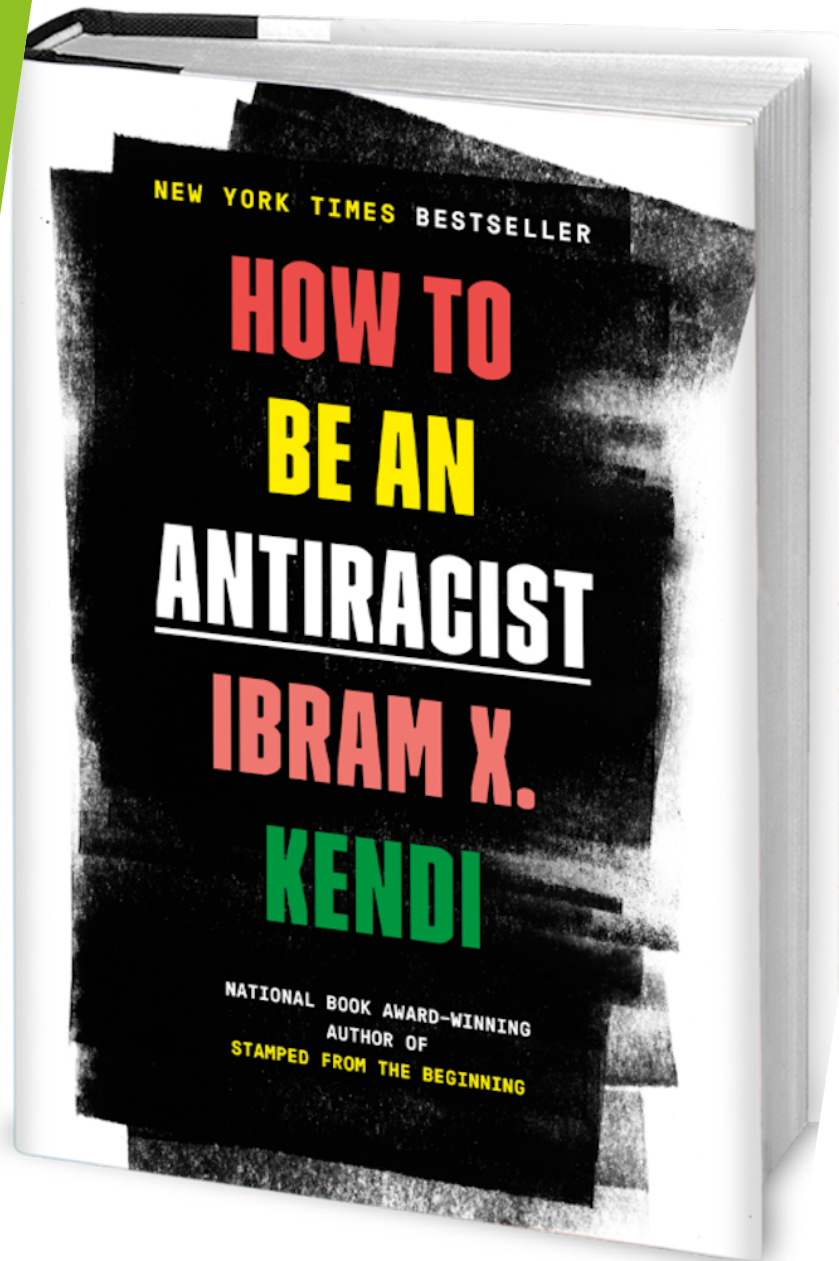
Anti-racist computing

- Recognize that systems or policies that create or exacerbate inequities between the social races are racist.

- Systems or policies that reduces or bridges those gaps is anti-racist.

- "Racist" is a description, not a pejorative. If you have helped create something racist, don't get defensive about the term. Work to fix it.

Who benefits from what I'm making? Who bears the cost?

- Seny Kamara's talk --- Crypto for the people. Crypto has historically benefitted large, powerful institutions.

- That's true for most of computing: needs-driven, and usually the "needs" are set by industry or government or institutions with lots of money (to fund research).

What voices are represented in design? What voices are represented in evaluation?

- Typically, we design for "people like us" who do "things like this"

- But there many people who are not like us. Are those people considered in the design? In the evaluation?

- Representation in formative evaluations (where you're figuring out what you should build)

- Representation in summative evaluations (where you're figuring if what you built works)

You will screw up. Don't get defensive, listen and adapt.

- Remember: racist is a description, even if it is often used as pejorative.

- If something you make is deemed racist, your first thought shouldn't be: "no way, I'm not racist!"

  - Ask yourself, instead: "Does the thing I'm making create and exacerbate inequities between the social races?"

  - Use systems thinking to answer that question!

  - Not just: "no, it's just a photo tagging service that can be used the same if you're Black or white or brown"

  - Does it pre-suppose that all of its users have a certain background or certain equipment? Are there inequities in who has those backgrounds and equipment? What can you do so that your system can be more accessible?

Not going to be easy

- We're talking about changing the system of our world, of our profession.
- There is a *lot* of inertia to overcome. It took years of viral Black death before we started talking about race in this class, for example.
- Much easier to stick with the status quo.

- But the status quo is racist.

Revisit: What Can We Do About It?

- Hire more diverse designers and developers
- Include diverse groups in testing and user research
- Be aware of our own privilege

- Pay attention to ongoing unexpected effects
  - Nextdoor example

Racism and on NextDoor

- Horrible racism problem
  - Post in my neightborhood: "There was a Black man driving really slowly down my street at 5 am! He was looking down at a cell phone and stopping at some houses but not others. It was really suspicious—keep an eye open!"
- Do you think NextDoor is:
  - A) Putting racism that already existed on display
  - B) Making racism worse
  - C) Both

NextDoor's New Approach

- Detect mentions of race
- Insist there are at least two other descriptors
- Result: 75 percent drop in racial profiling on the site

Broader Point: Computing and Society Should Consider Everyone in Society