

Is tech really coded for everyone?

Unintentional biases in our algorithms and data sets & where to go from here.

 Research Credit: Algorithmic Justice League

Hello everyone! Thanks for joining. . . . Alright let's get settled in Now, traditionally technology tools have been promoted great equalizer. As long as we have a smart phone, tablet or laptop that can connect to the internet, we can get online and use tools like YouTube, Instagram, Kahn Academy and numerous others to learn, have voice, and stay connected with other family and friends. You don't need to have a 6 figure salary or 4 year degree to do so. And there are certainly instances where tech has helped to level the playing field in society. But tech and the coding behind it is made by humans, and humans are not perfect. . . . So what we're talk about today are instances where there is unintentional biases the algorithms and data sets behind it all



Now before I go any further I'd like to give credit to Joy Buolamwini and her crew at the Algorithmic Justice League. You may have seen or heard Joy the last few years on a TED, the cover of Fast Company, sharing her group's expertise with the Federal and a few State governments.



Algorithmic
Justice League

**Technology should serve all of us.
Not just the privileged few.**

Join the movement towards *equitable* and *accountable* ai.

Their mantra is

Krista Ewing,

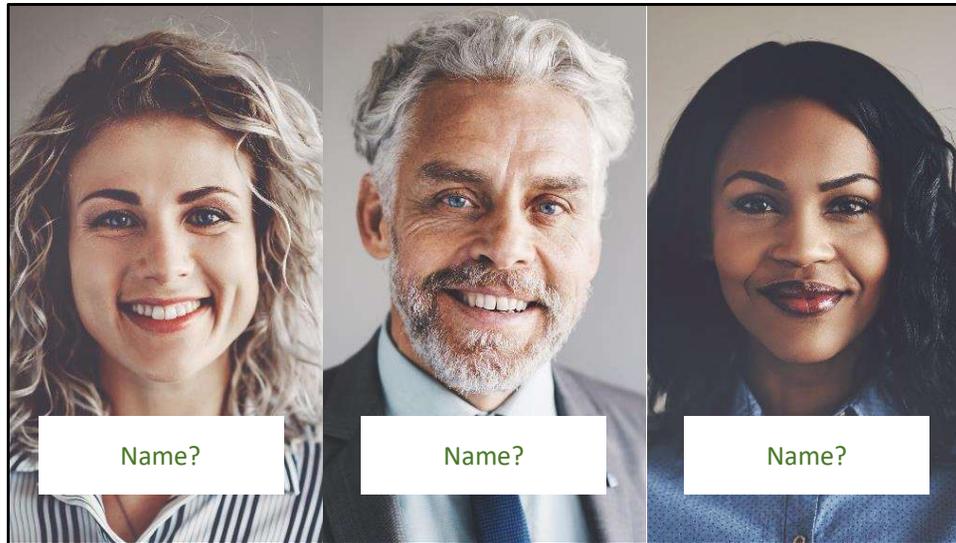
Senior Learning Systems Professional @ Humana

Wife, Daughter, Dog & Cat

Experienced Geek of Tech, Graphics, Data, and Policy

Rugby, Cycling, & Coffee





So let's start out with a few stories., but to make it a little more real, I'd like some help with names. Maybe names of people you've known in life. Can anyone give me a name of a white female? How about a Hispanic male, where English is his second language. And finally a black female. You can make up names too.

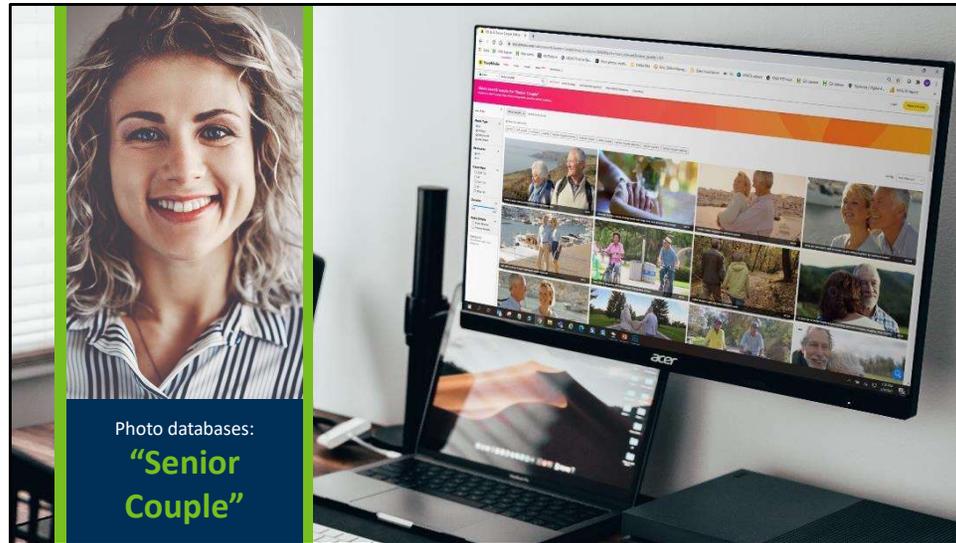
Thanks!



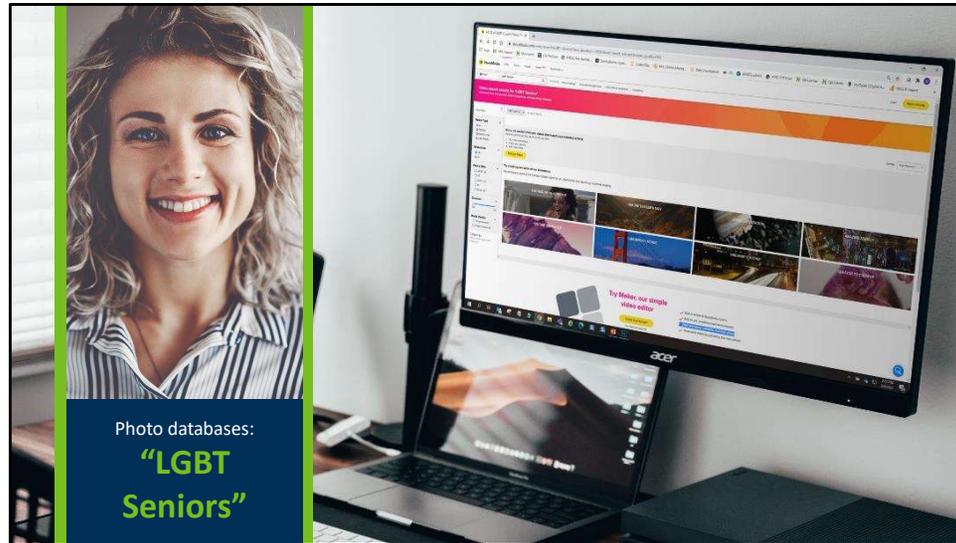
Alright . . . It's 2021 and tech is everywhere! The internet's been around for 28 years, Artificial Intelligence machines like IBM's Watson have been around for 17 years, and the smart phone has been around for 14. . . It seems there's not a single industry or device that hasn't been touched by – right?



In our first scenario **Name** is a graphic designer for a big national nursing home group. It's Q4 at work and it's the time of the year to start designing the company's annual look back presentation. She searches "success" in the photo database they subscribe to and she quickly realizes the results for the search term "success" are nearly all white males celebrating. She's disappointed and annoyed in the lack of diversity represented, but **Name** is able to dig a bit deeper, type in some other searches, and makes sure her presentation is full of a whole array of diverse successful professionals.



::Name:: has a huge heart and really invested in her community too. So she also helps to lead one of her work's internal networking groups for LGBT advocacy as an ally. It's October. . . It's LGBT History month, so she's hoping to include a weekly fact & photo in the company's weekly newsletter. Again, ::name:: turns to her photo database. She searches "Senior Couple" hoping to find 4 photos of LGBT Senior couples. No luck, only straight couples.



So she targets her phrasing more – “LGBT Seniors”. Nothing. She spells it out 4 ways, Lesbian seniors, Gay seniors, Bisexual seniors, and Transgender seniors . . . Nothing. Again she’s disappointed and annoyed, but it’s just a reality she’s used to with what this database provides. She finds a few black and white historic photos on Google and moves on.



Next, `::Name::` is a Florida real-estate agent who's originally from Mexico City, Mexico and moved to Florida about 7 years ago. He's meeting a with one of his client's today, Matt, who's about to close on a new vacation home.

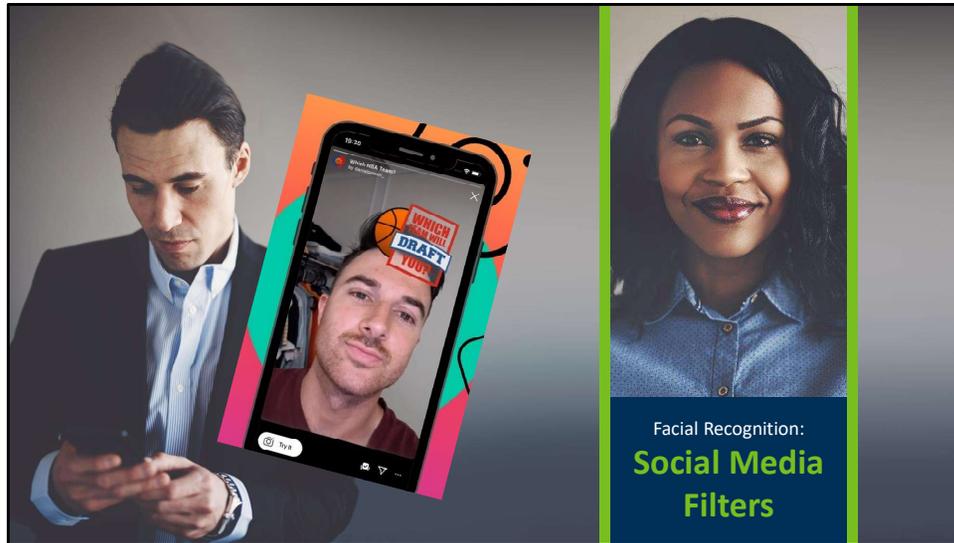


One step in the closing process is to check a client's credit score. With his iPad, ::Name:: calls into his company's standard prompt to cross off this step in the process. After a single ring, the automated prompt kicks in and says "Welcome returning agent! Please state the reason you're calling."
::Name:: replies "Check Credit Score."



The automated prompt replies back, “We did not understand. Again, please state the reason you’re calling.”
::Names:: hands are sweating. . . He’s a bit embarrassed. He tries twice more. Nothing.
Finally his client states “Check credit score.” and the prompt proceeds.

::Name:: noticed this a few times. . . . The prompt seems to trip up with people who talk fast or anyone that has a non-Anglo accent as well. It’s frustrating, but he deals with it.



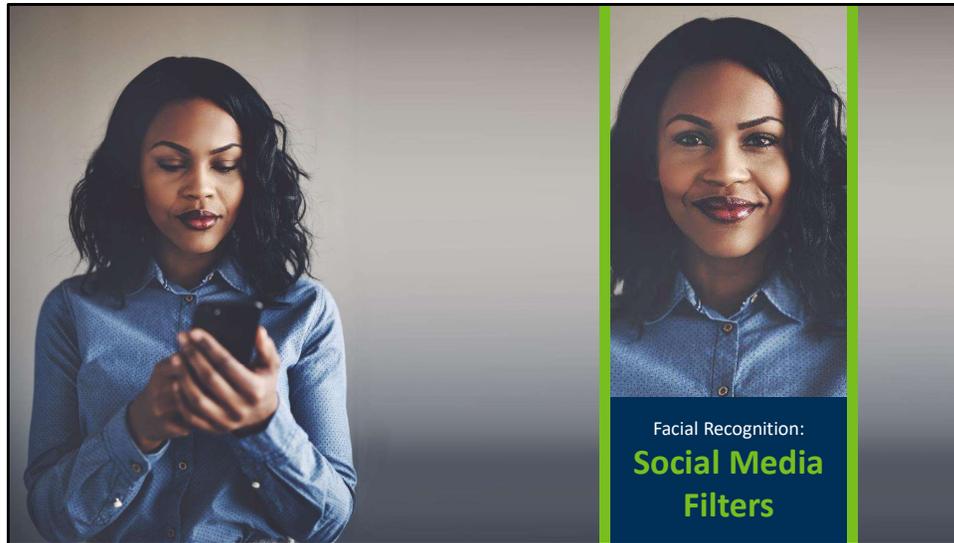
Finally **Naomi** and her friend Gavin at work are huge NBA fans. Gavin found pretty cool filter on Instagram called “Which team will draft you?”



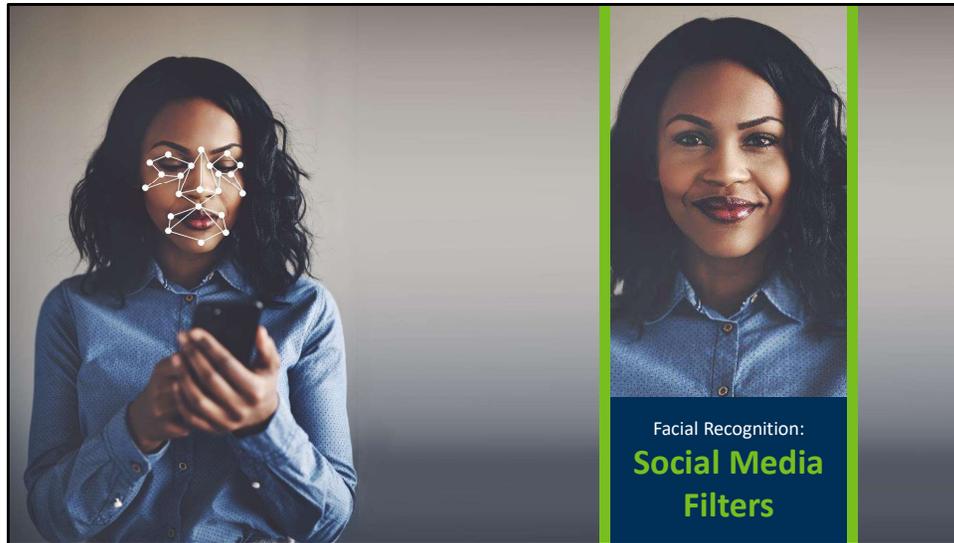
He tries it out. . . . It instantly scans and detects his face . . .



And boom! Utah Jazz! He groans, because he's a big Lakers fan, a rival of the Jazz.



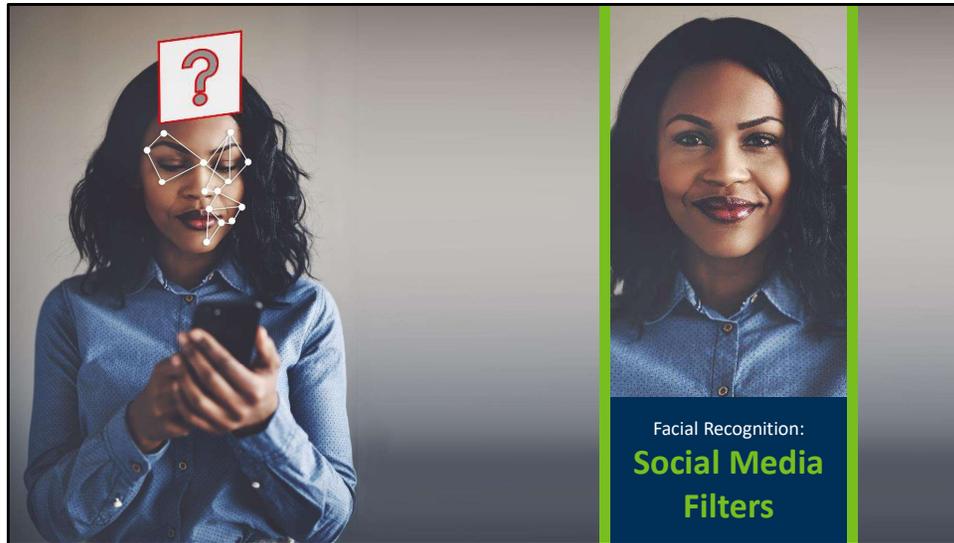
Gavin mentioned the filter to ::Name::, so later that day she goes to try the filter too. She's a big Bulls fan.



Now. . . In a perfect world, just like Gavin, the filter would have detected her face and showed a result.



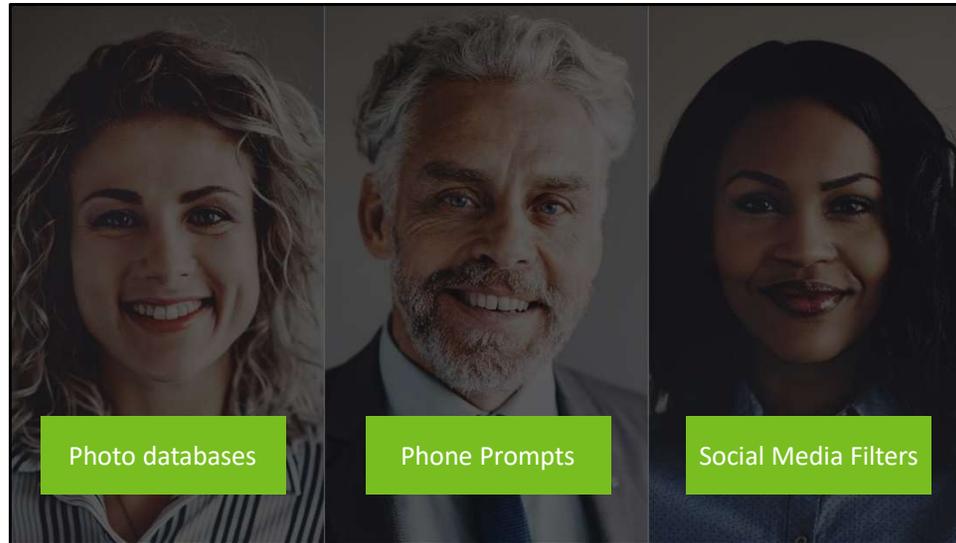
But. . . in reality, the doesn't.



It keeps giving ::Name:: and error stating it can't detect her face.



This only reminds me of her sorority sister Joy's experience with something similar, only Joy was able to get the filter to detect her face when she put on a white mask instead.



The databases and the algorithms built and coded by normal human beings definitely negatively affected all three people here. But these are lower risk, lower impact situations.



However It's 2021 right? And tech is everywhere! . . . Especially as it promises businesses ways to save money, work efficiently, and gather data bigger insights like never before.

So now this time in-between scenarios, I'm going to sprinkle in a little data and industry facts.



Going back to `::Name::` . . . Well `::Name::` has been working for the Nursing Home company for about 6 years now and would like to move to a graphic design leadership role outside the company, so she applies to a place we'll call Acme Inc. They're a large international company the specializes in tech. She finds a position, meets almost all of the qualifications and requirements, and applies.



Within a day she receives an email that she did not move onto the interview round. She would have made a great fit at Acme Inc., but she never got past the first phase.

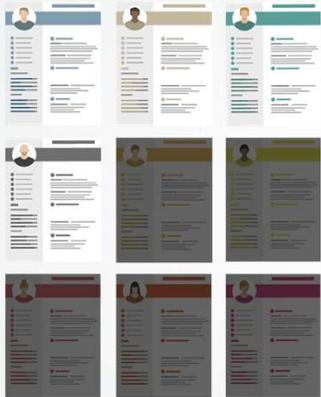


Why didn't she at least get an interview? It turns out Acme Inc. gets over 400 applications for the leadership role. It would be nearly impossible to have a human being review all of those in a reasonable timespan, so Acme's software development team built a tool to prescreen applicant's resumes. Like many HR hiring tools, it bases its algorithms off of keywords from the initial job posting and what's stated in the resume to help narrow down resumes. But! Acme's HR and software teams want to make sure they're interviewing people who are likely to succeed. So their tool gathers the all of the incoming resumes, and sorts and compares those resumes to current Acme Inc. leaders resumes with positive annual reviews.

What the software team forgot to check for was bias. . . . (gender bias, racial bias, LGBT bias, etc.). In this instance it turns out, only 7% of all of Acme's leaders we women. . . . So the algorithms tag the word "women" or "women's" as a likely unsuccessful candidate. ::Name:: went to Barnard Women's College. So . . . just like that, the algorithm flags that as undesirable based on present leadership success, and she's dropped from the pool of 400. HR doesn't look at the rejections, so not a single real person caught the bias.

amazon

Real Life:
Amazon could **not** remove the bias & had to scratch the system all together.

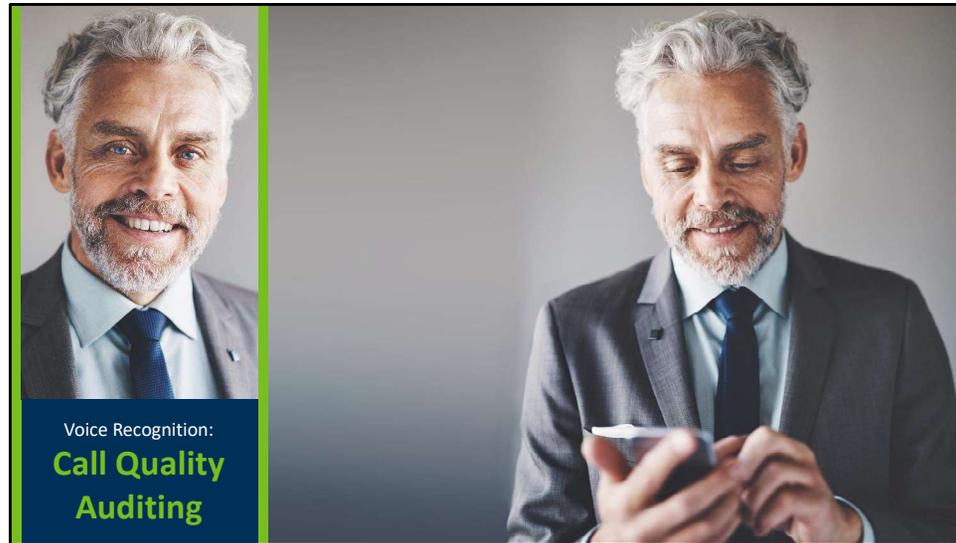


 Research Credit: Algorithmic Justice League

Now in real life, where this was found and actually made public, was with Amazon. They built out the same sort of HR tool. I'm happy to say though – Amazon got it right in the end though. They found the gender bias, tested, tweaked, and tested some more, and they could not remove the flaw. The resumes that contained the word “women” or “women's” or even “all women's colleges”.....aka any text-based indication of being a woman, were categorically being ranked lower than those that didn't. So Without being able to remove that gender bias, they ended up scratching the system.



Next, let's go back to **John**. . . . As a real estate agent for a large national company, **John** is also appointed to help do sales for clients who cannot always tour a location in-person. He's worked with military service members stationed over sea, families that live outside the country and are purchasing a vacation home, and some are moving from across the country to Florida and can't make the flight out.



The real estate group has a new call quality tool they're contracted to use that helps to monitor calls, transcribe what's said, and give recommendations for how to better close the sale. ::Names:: leaders can also use the tool to audit the transcripts of the discussion and make sure the agents and compliantly making sales, or even recommending certain add-ons the company is recommending.

For ::Name:: the auditing tool just runs in the background for the most part. He initially was really interested in what advice it had for closing particular sales



But once he dove in, it just all seemed off. This was supposed to be an advanced artificial intelligence (ai) tool that, after some analysis of the transcript, could tell a client's psychology profile, and recommend how to better connect and close a sale. Almost every piece of advice for what he was doing wrong and should change, looked irrelevant. He'd been saying almost all of it already.



By the end of the first year using the tool. **John** and his team met with their regional director, and one of the big topics that was brought up were the team's high compliance infractions on calls the tool was auditing and reporting. It turns out almost all came from **John**. He didn't agree, but what was he going to do? He met with his boss 1x1 later that day, and was actually let go. They said he brought too much risk to the company with those rates.



The most he could do was sue and go through a long drawn out legal process, but at this point in life **John** didn't want to pick that battle, so he started applying to other agencies and also considered retirement.

Why did things go so south for **John**? Well in this case the ai tool the company was using worked great for his teammates who were born and raised in Florida, but for **John** and a few other employees around the country whom English was their second language, the software had a much higher degree of inaccuracy due to their regional accent. The real estate company did not vet the accuracy of diverse voices and accents. The group that coded and built it, was small, but made big promises, especially when it came to their focus on client psychology and a real estate agent's legal compliance.

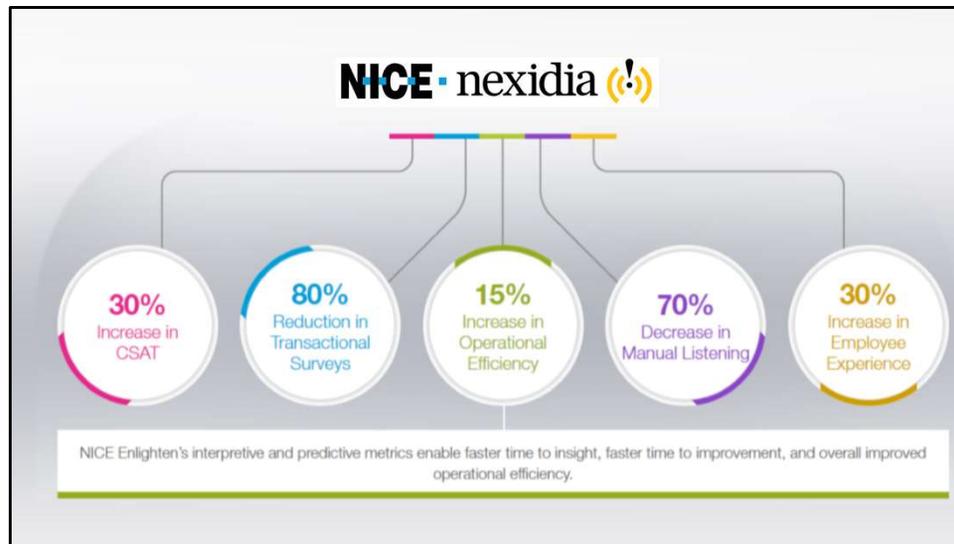


Right now even the tech industry's biggest companies like Microsoft are still trying to nail down the accuracy of their speech recognition systems. This article. . . . Just came out mid January!

https://venturebeat.com/2021/01/15/microsofts-new-settings-let-users-contribute-voice-clips-to-improve-its-speech-recognition-systems/?utm_campaign=Daily%20Roundup&utm_medium=email&utm_source=Revue%20newsletter



In my own line of work with making recording ADA compatible for people with poor hearing, I worked on automatic transcription software tools. In one a narrator spoke slow and focused on articulating her words smoothly. The automated transcript was about 80% accurate for her audio clips, so we'd only have to play clean up for 20% of all the words for whatever video it was for. But when it came to one of our quick talking animated narrators, I'd estimate it was only about 30% accurate. The tech just wasn't there for his voice and his pace. And there is different accuracy levels for different software, like text to speech on an iPhone, but the reality is, it's still not perfect, even for massive companies like Apple, Amazon, and Microsoft.



Behavioral analytics traditionally monitored a person's clicks, swipes, and digital behavior over times to help expedite customer service and even automated help.

But now, companies like Nice Nexidia are taking that to the more human world, and analyzing what they can capture is said on a call to help with customer service, legal compliance, and closing sales. Like you can see here. . . . They're making big promises on efficiency, Customer satisfaction for a brand, and more.

Real Life:

Behavioral analytics &
Interaction analytics software



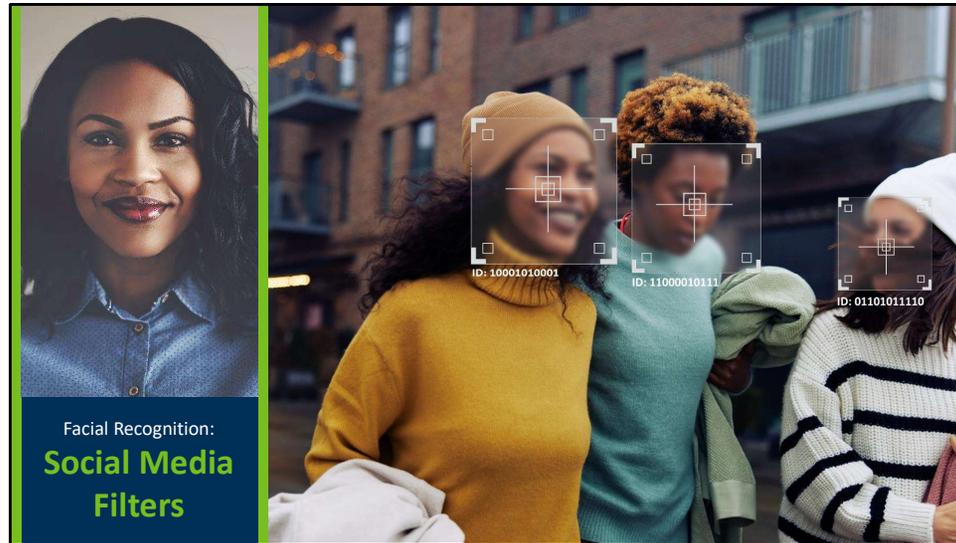
I've yet to find any studies of proof of their accuracy when it comes to diverse voices though. And this is only one company, what about others that get into the business of building behavioral analytics?

Without mandated oversight and regulation on such technology you have to wonder what really is the incentive to check for minority scenarios?

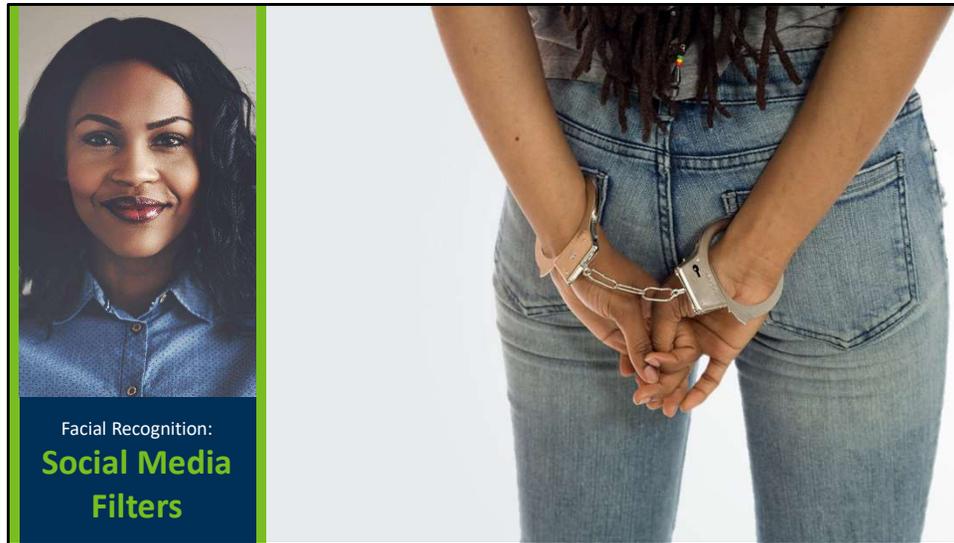
<https://mixpanel.com/blog/behavioral-analytics-guide/>



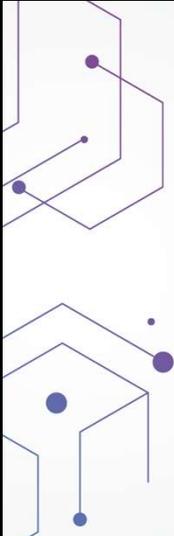
Finally, in our last scenario today we have `::Name::` again. She and her friends are fully vaccinated and they're going out on the town to have a glass of wine and celebrate.



As they're walking to the bar, they didn't realize it, but their faces were scanned by a hundreds of police cameras spread throughout the city. They were in a public space, so it's completely legal. The facial scanner picks up the suspect's face a suspect from a bodega robbery a few weeks ago and notifies police stationed a block away.



They stop **Name** and her friends and pull **Name** aside to question her. She immediately scared and upset and can't seem to think quickly enough as they ask question after question. So they put her in cuffs and bring her into the local police station for questioning. After further questioning and looking at the grainy facial scan from the camera, they realize it was just a false-positive tag, and they release **Name** to go home. She relived to be released but still mortified and slightly traumatized by the experience. It's a terrible experience that will always stick with her and her friends.



1 in ?

American Adults

1 in ___ American adults have their face in a database police can **legally access unwarranted** and use unregulated facial recognition technology to attempt to catch criminals. This facial recognition technology is not audited for accuracy.

Research Credit: Algorithmic Justice League



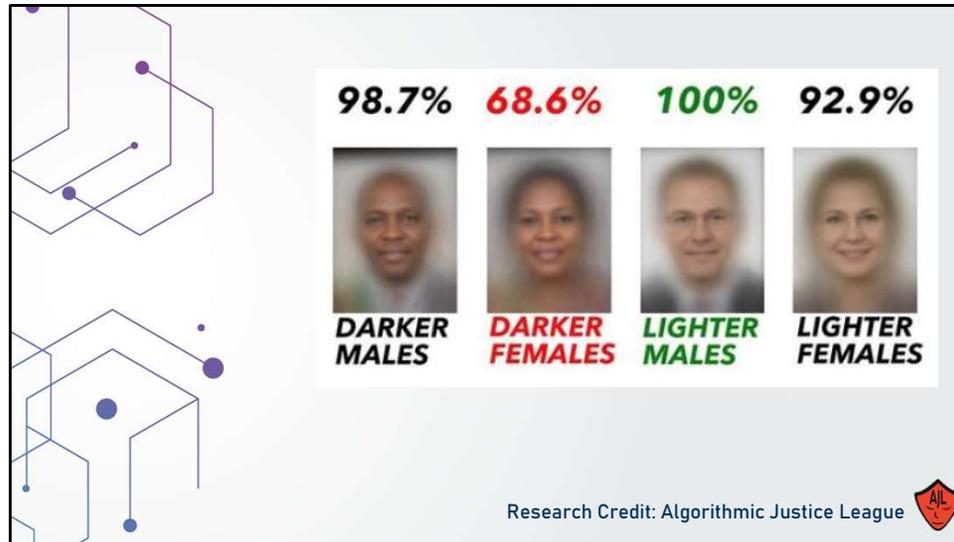


A [New York Times investigation](#) revealed earlier this year that Clearview AI built a database of 3 billion images scraped from the internet that was accessible to more than 600 law enforcement agencies,



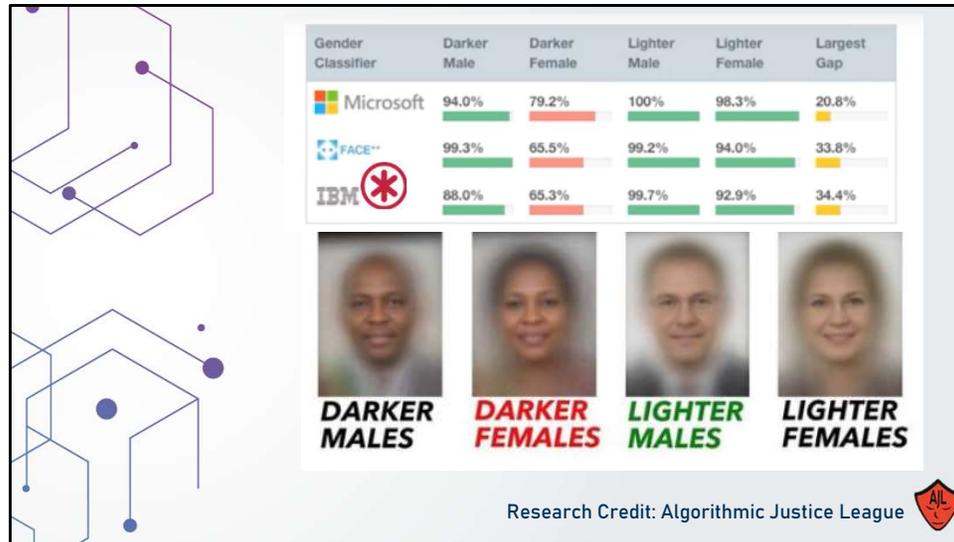
In October of 2019 Cedric Alexander, the former president of the National Organization of Black Law Enforcement Executives, estimated that at least a quarter of law enforcement agencies across the US use facial recognition to some degree.

Congressman Elijah Cummings, the former chair of the House Oversight Committee, said there are about 50 million surveillance cameras in the US can you imagine how many more there are now, a little over a year later



Even if there was a facial recognition system with near-perfect accuracy in the testing phase, it doesn't solve the problem that most data used by law enforcement is often grainy and low resolution. One study by Georgetown University found that in some cases police were even trying to match people by composite artist sketches.

* - ::explain astericks::



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* - ::explain astericks::



US Police department do not release statistics on their use of facial recognition tech, but in the UK, where they have their police departments track usage and accuracy, they are finding 92% false-positive rates in 2018.

Whether the person is arrested or not, police bringing a person in for questioning due to a false positive can be traumatizing.

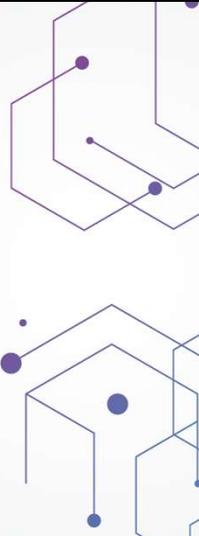
<https://www.bbc.com/news/technology-54349538>

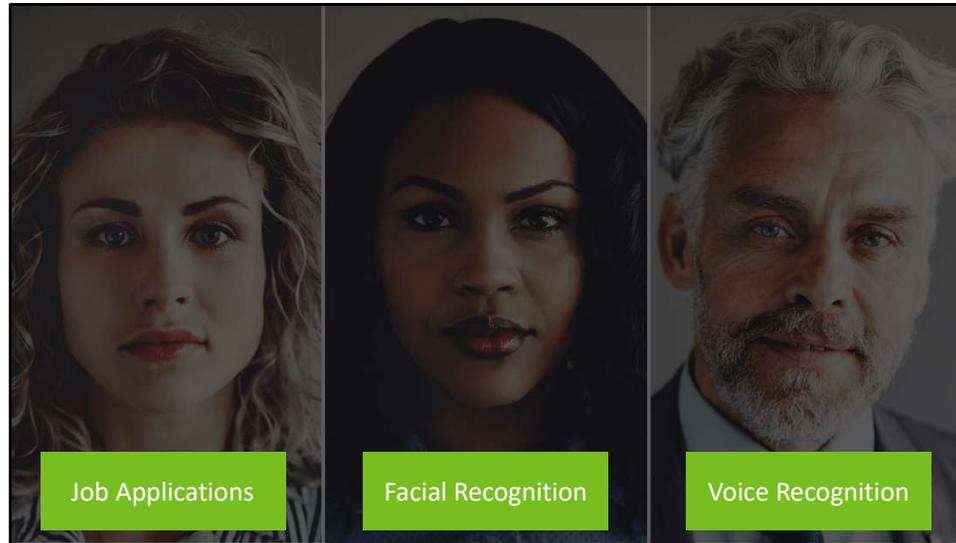


Real Life:
In June 2020, Microsoft, Amazon, and IBM put a hold on selling their facial recognition technology to police departments



Research Credit: Algorithmic Justice League





So as you can see, the scale can be pretty high, or even higher than we discussed here, when it comes to an algorithms impact on a person's life.

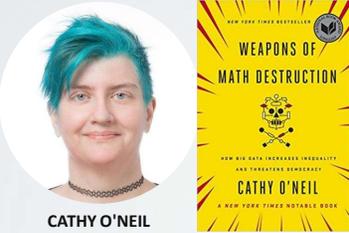


Algorithms are everywhere in 2021, not just the areas we touched on here. They're a part of loan applications, job recommendations, healthcare prioritizing and more.



The stories you just heard were all based on real scenarios over the last 3 years or so. But behind the curtain, 99% of the time, is not some malicious IT database builder, or evil algorithm coder . . . it's a set of, often homogenous, human beings that built a tool with great intentions and sometimes big promises . . . But they forgot to include diverse perspectives and experiences.

We frequently sell the sizzle of leveraging tech as being better (more efficient, cheaper, more advanced outcomes, etc.) than leveraging humans. But the reality is there's always a human behind the creation of the tech, and humans are not perfect.

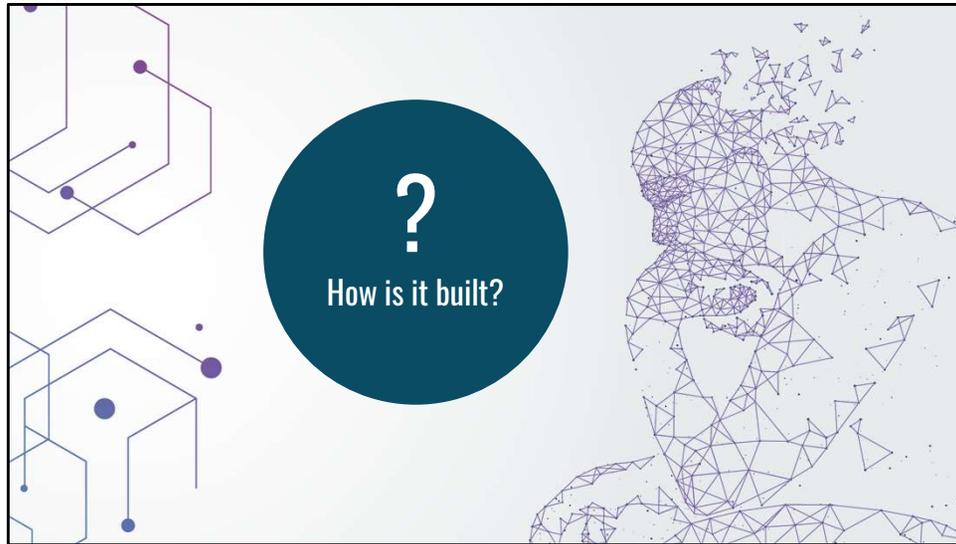


Algorithm:
Using historical information to make a prediction about the future.

Machine Learning:
A scoring system that scores the probability of what you're about to do.

Algorithm:
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So now Let's go over the basics for one piece of technology: facial recognition.



So



JOY BUOLAMWINI

“So an example of this - what I found was that for face detection, the ways in which systems were being trained involved collecting large datasets of images of human faces. And when you look at those datasets, I found that many of them were pale and male, right?”

You might have a dataset that's

75% male faces, over 80% lighter-skinned faces.

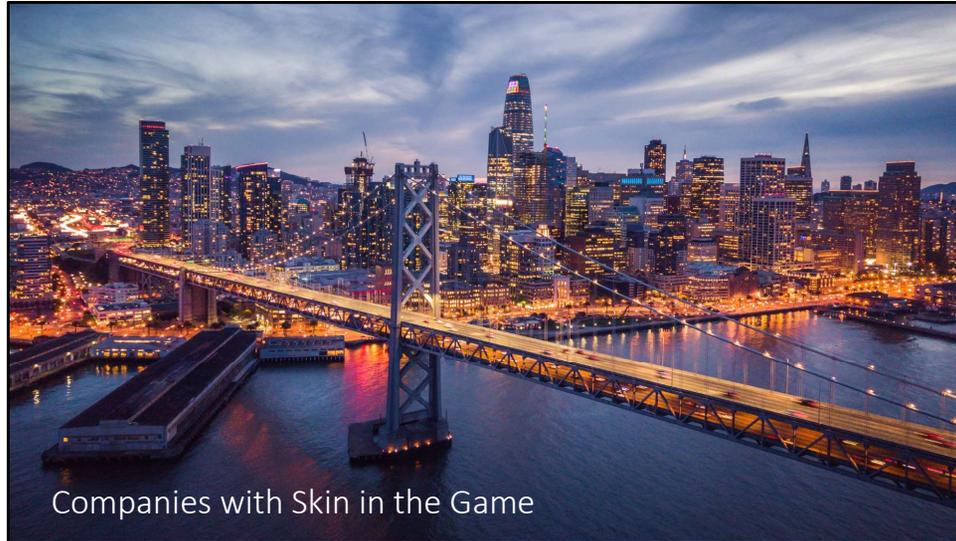
And so what it means is the machine is learning a representation of the world that is skewed. And so what you might have thought should be a neutral process is actually reflecting the biases that it has been trained on. And sometimes what you're seeing is a skewed representation, but other times what machines are picking up on are our own societal biases that are actually true to the data.”



https://www.ted.com/talks/joy_buolamwini_how_i_m_fighting_bias_in_algorithms#t-239793

Computer generated discrimination often unintentionally coded in.





Organizations like NEC, IBM, Microsoft, Google, Facebook, Amazon, Megvii, and Axon all are major players in the Facial Recognition Tech world.

And. . . Sometime for the good, and sometimes for worse FRTs are being weaponized application in life-and-death contexts, with companies like [Clearview AI](#) working hand in hand with law enforcement agencies and the immigration/detention/deportation system, and military forces.

Current Policies

Bans:

- San Francisco (CA) ordinance;
- Somerville (MA) ordinance;
- Oakland (CA) ordinance;
- Berkeley (CA) ordinance;
- Brookline (MA) warrant article;
- Northampton (MA) ordinance;
- Cambridge (MA) ordinance;
- Boston (MA) ordinance;
- Portland (OR) ordinance.

Active Bills:

- A New York State bill (S 6776);
- A New York State bill (S 7572);
- A US Senate bill (S 4084).

Moratoria:

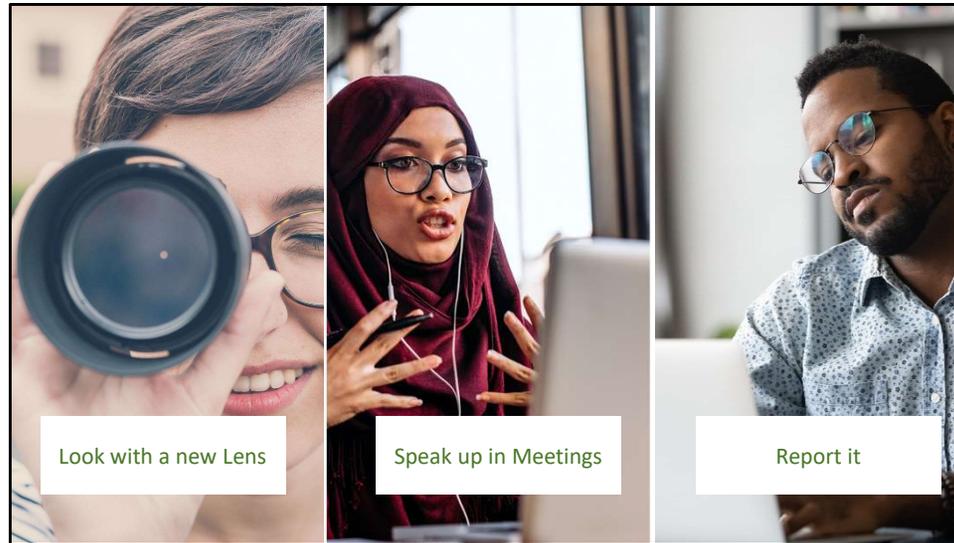
- State of California moratorium on the use of face surveillance with police body cameras (AB 1215).

Current policies

Model Bills

- Community Control Over Police Surveillance Model Bill (via ACLU)
- Community Control Over Police Surveillance and Militarization Model Bill (via ACLU)
- Face surveillance ban model bill (via The Electronic Frontier Foundation)
- The Facial Recognition and Biometric Technology Moratorium Act - making its way through the U.S. Congress

Current policies



What can we do?

. . . . These are sociotechnical issues. . . . We cannot purely focus on the technical portion, and expect the societal impacts to be resolved at the same time.

-Start to look at the world with a different lens

-If you're privileged to be at the table of technology decisions, advocate for data sets of equality and audit over a broad array. Also always seek diverse perspectives and experience. You're human and have only live one life. That's ok - bring other in.

-Report it. Talk to your leaders, if you don't feel comfortable doing that, report it to your ethics hotline.

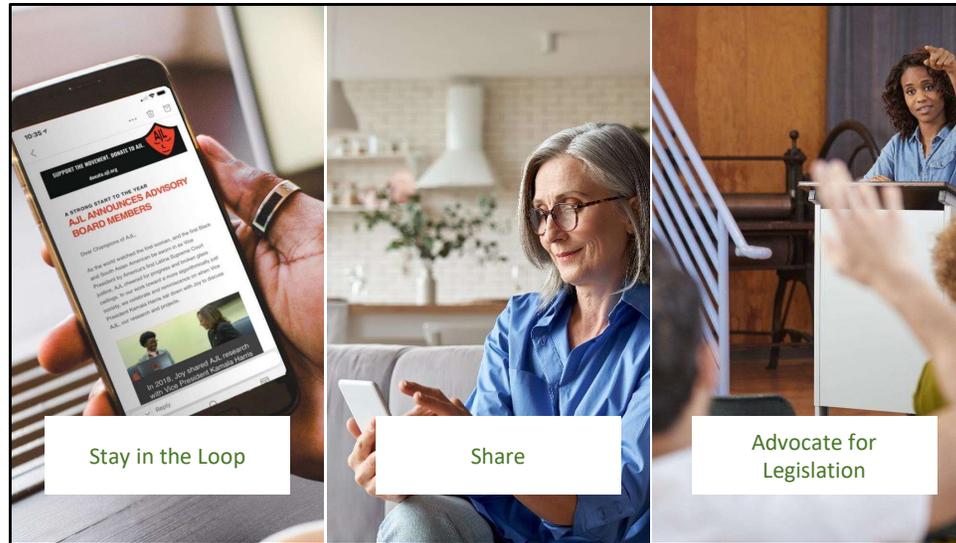
-Continue to educate yourself, like tech, the matter is evolving

-Share these findings! Talk about it in casual conversations with family, friends, and co-workers. Personalize share the AJL, ACLU, MIT, and other groups posts about the topic on social media.

-Advocate for legislation locally and federally.

-Get connected with the AJL. Share your story, request a workshop, request an algorithmic audit, and if you're a researcher, you can even request an inclusive dataset to test algorithms and AI models from the AJL.

-Finally, if you're an educator, please consider this topic in your semester's curriculum



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Algorithmic Justice League



Request an Audit



Coded Bias Movie

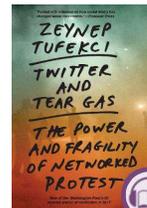
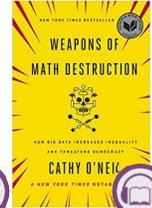
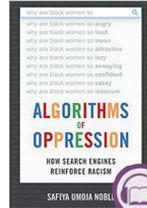


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A Workshop

Books & Audiobooks



Krista Ewing,

Senior Learning Systems Professional @ Humana

Wife, Daughter, Dog & Cat

Experienced Geek of Tech, Graphics, Data, and Policy

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