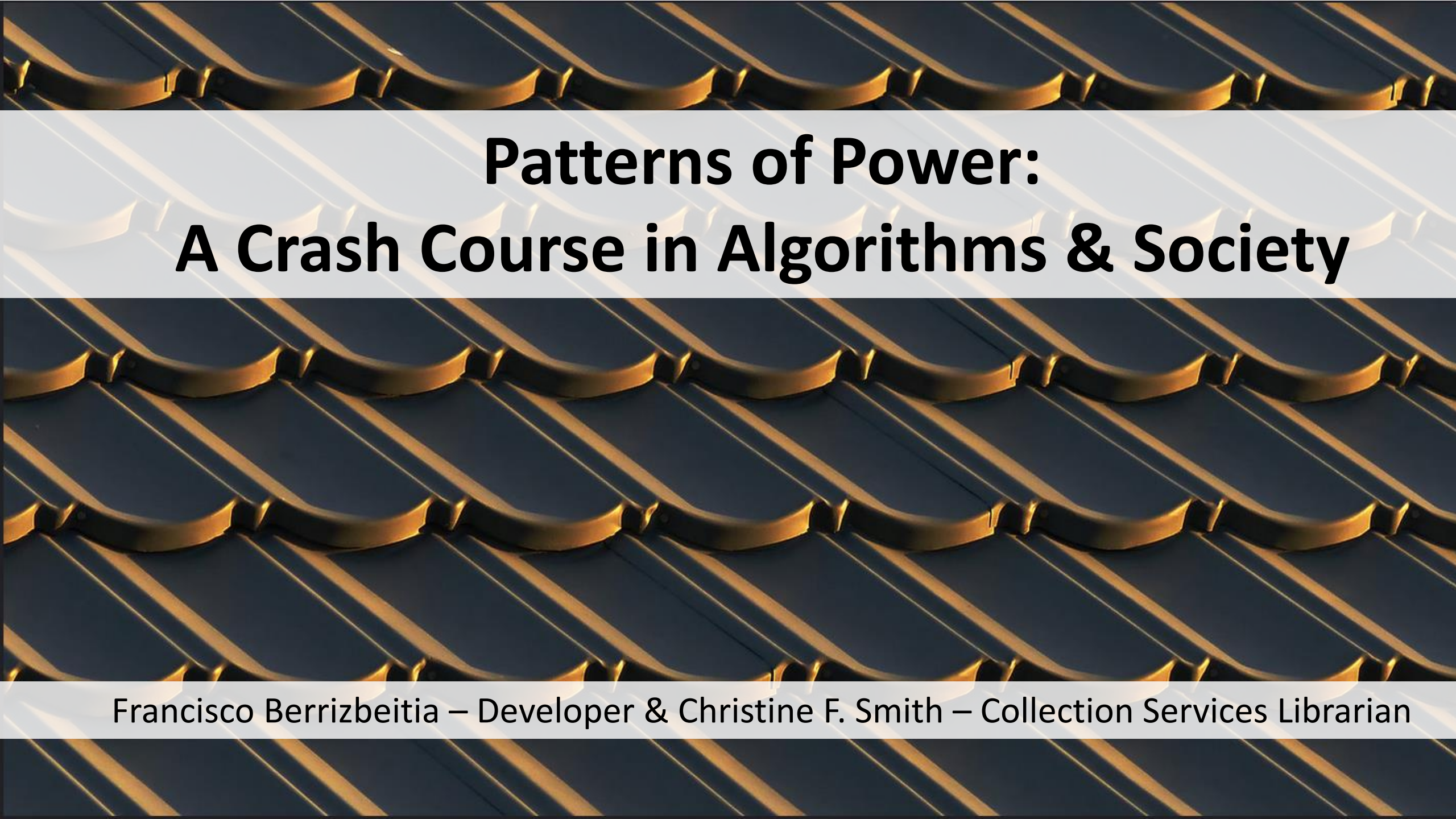


Patterns of Power:
A Crash Course in Algorithms & Society

Francisco Berrizbeitia – Developer & Christine F. Smith – Collection Services Librarian

Agenda

- Key terms (15 minutes)
- Societal impacts (30 minutes)
- Practical application (30 minutes)
- Questions and discussion (45 minutes)

Key terms

Algorithm (noun)

a step-by-step procedure for solving a problem or accomplishing some end especially by a computer

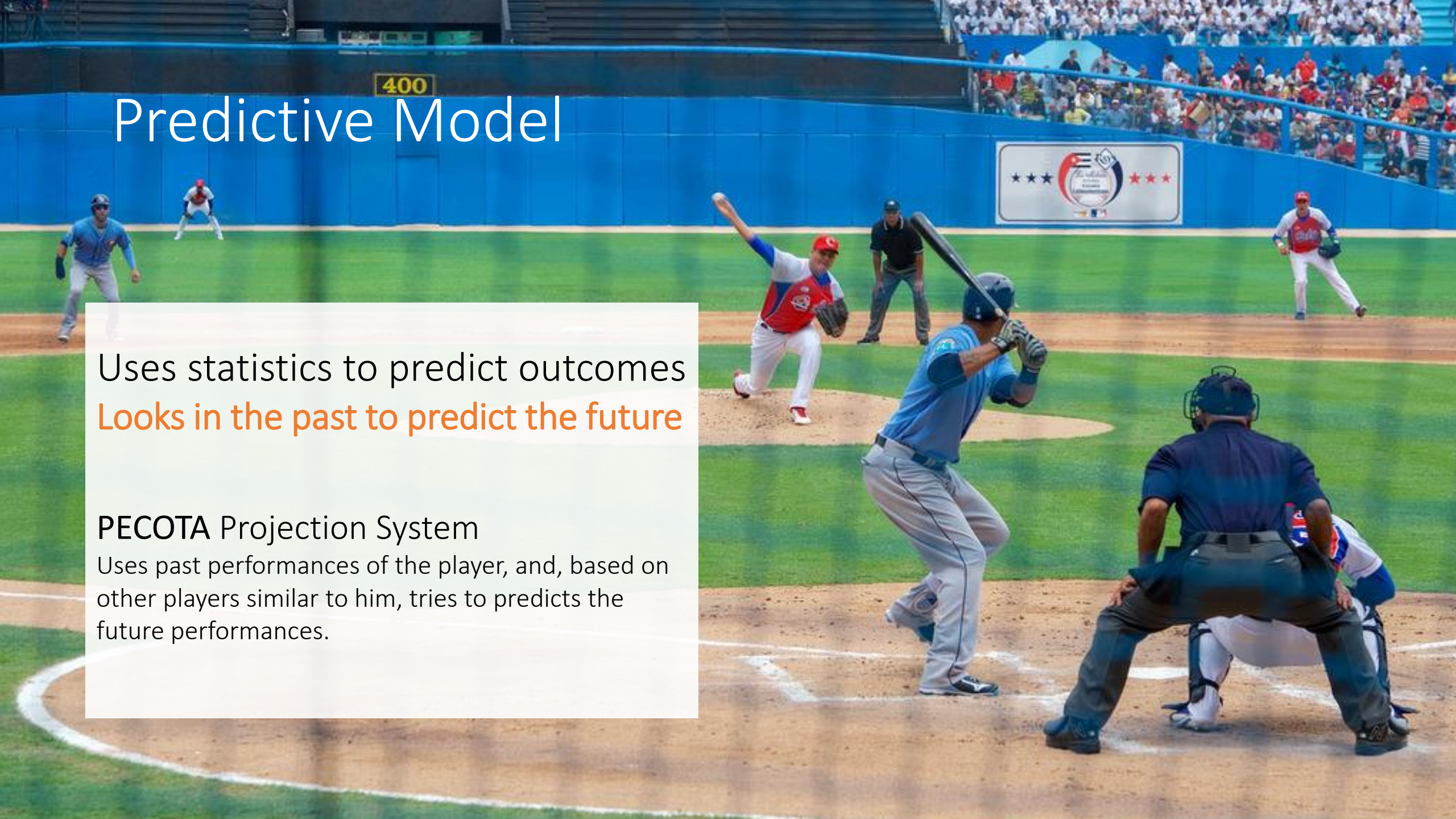
(Fry, 2018, p. 7)

Algorithm

- There are two paradigms of algorithms
  - Rule-based algorithms (if, then; step by step)
  - Machine-learning algorithms (AI)

(Fry, 2018, p. 10)

Predictive Model



Uses statistics to predict outcomes

Looks in the past to predict the future

PECOTA Projection System

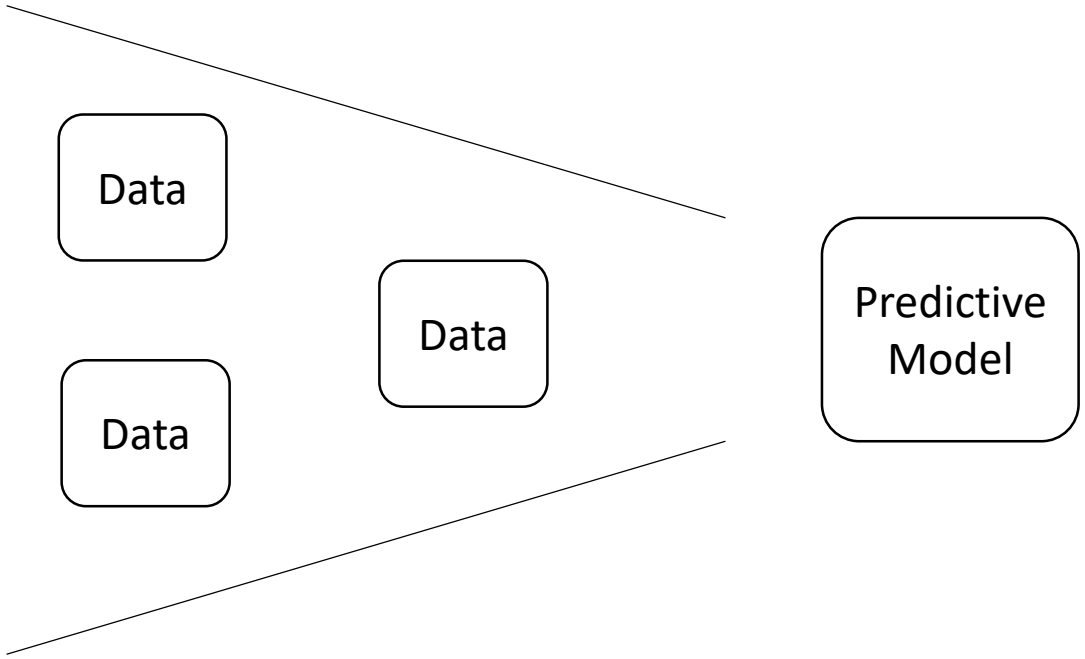
Uses past performances of the player, and, based on other players similar to him, tries to predicts the future performances.

Predictive Model

Lets imagine a model to predict if an animal is capable of flying

Predictive Model

Machine Learning



A machine learning algorithm analyses a corpus of data to derive a predictive model.

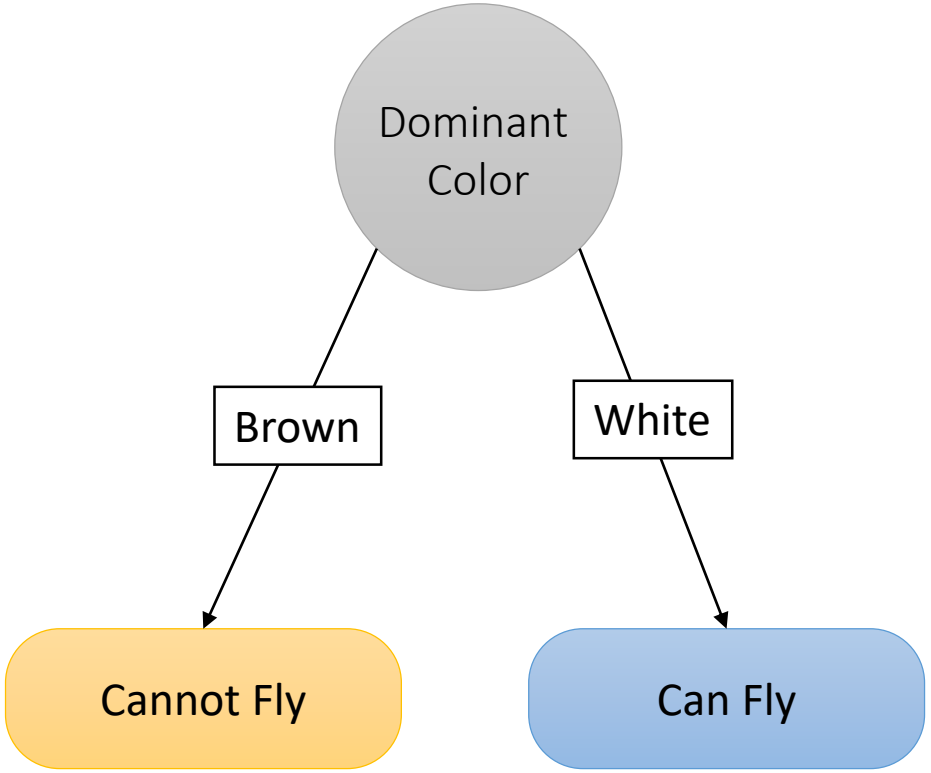
This is done by finding patterns in the data that many times are imperceptible to humans.

Machine Learning





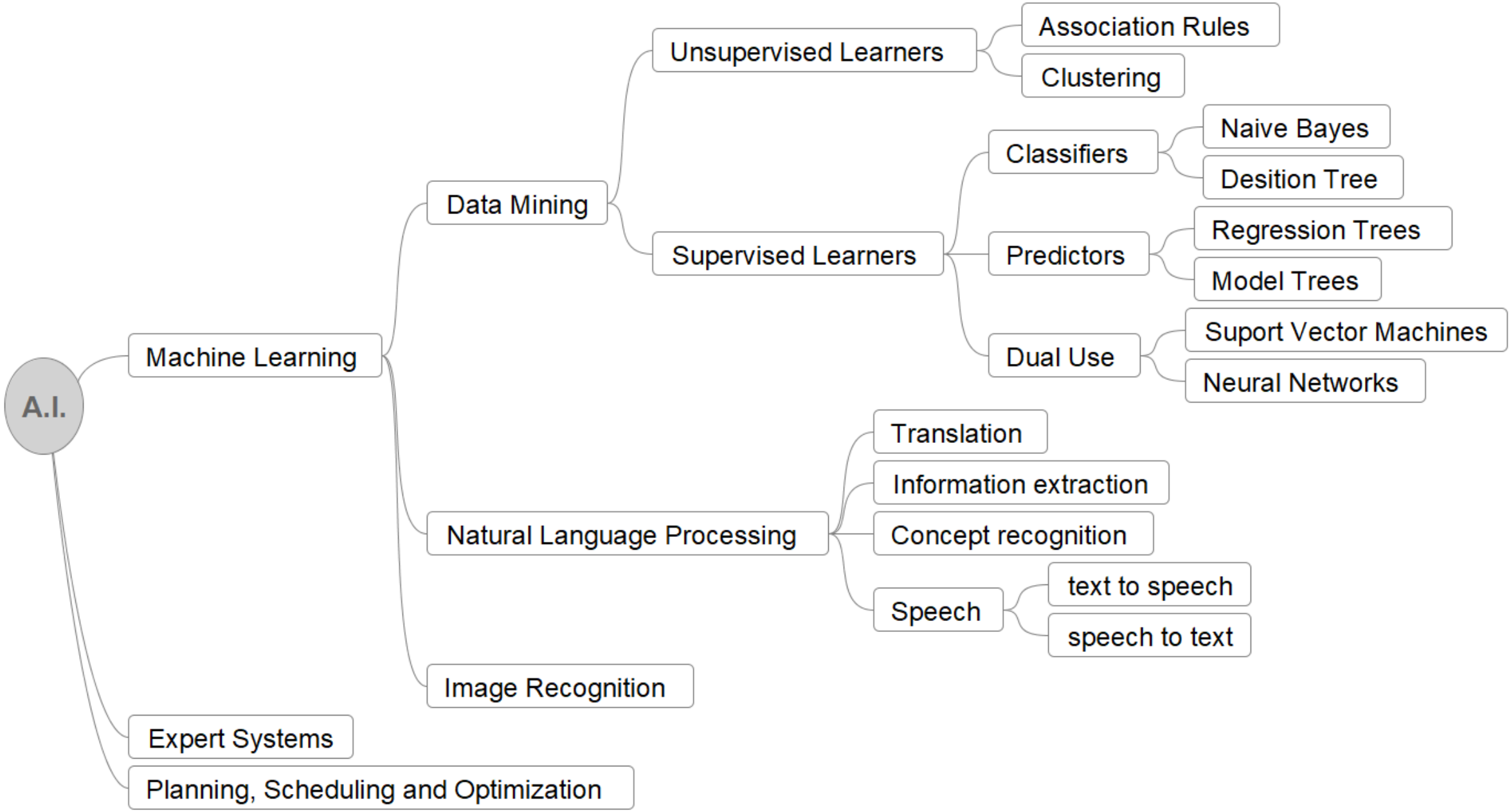


Artificial Intelligence

“the quest to build machines that can reason, learn, and act intelligently” (Artificial Intelligence, 2019)

(MIT Technology Review, 2019)


A.I.
Machine Learning
Data Mining
Unsupervised Learners
Association Rules
Clustering
Supervised Learners
Classifiers
Naive Bayes
Desition Tree
Predictors
Regression Trees
Model Trees
Dual Use
Suport Vector Machines
Neural Networks
Natural Language Processing
Translation
Information extraction
Concept recognition
Speech
text to speech
speech to text
Image Recognition
Expert Systems
Planning, Scheduling and Optimization

What is bias?

“1a : an inclination of temperament or outlook *especially* **:** a personal and sometimes unreasoned judgment **:** prejudice

b : an instance of such prejudice

c : bent, tendency

d(1) : deviation of the expected value of a statistical estimate from the quantity it estimates

(2) : systematic error introduced into sampling or testing by selecting or encouraging one outcome or answer over others”

(Merriam-Webster, 2019)

What happens when one of these definitions leads to another?

What happens when we use history to define the future?

“These are not mistakes they are making. These are something called choices, choices about what is important to them, about what priorities they have”

(Wachter-Boettcher, 2018)

“When we take information from the past and use it without thinking about it and use it in the future...we reinforce all kinds of biases”

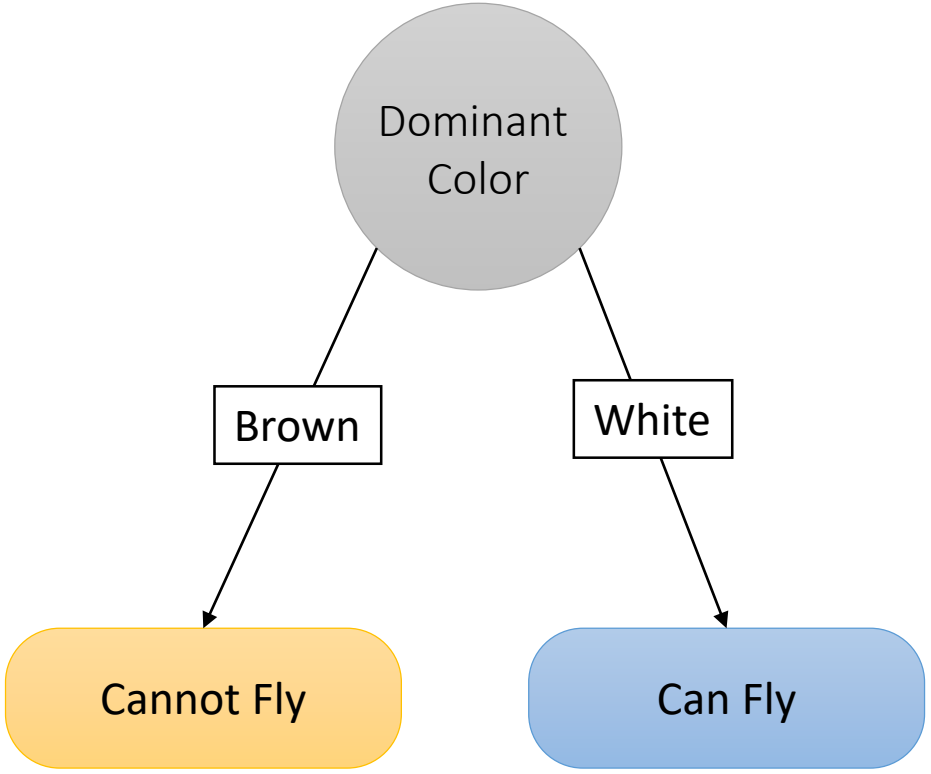
(Wachter-Boettcher, 2018)

Algorithmic bias

“ The term algorithmic bias describes systematic and repeatable errors that create unfair outcomes, such as privileging one arbitrary group of users over others. “

https://en.wikipedia.org/wiki/Algorithmic_bias

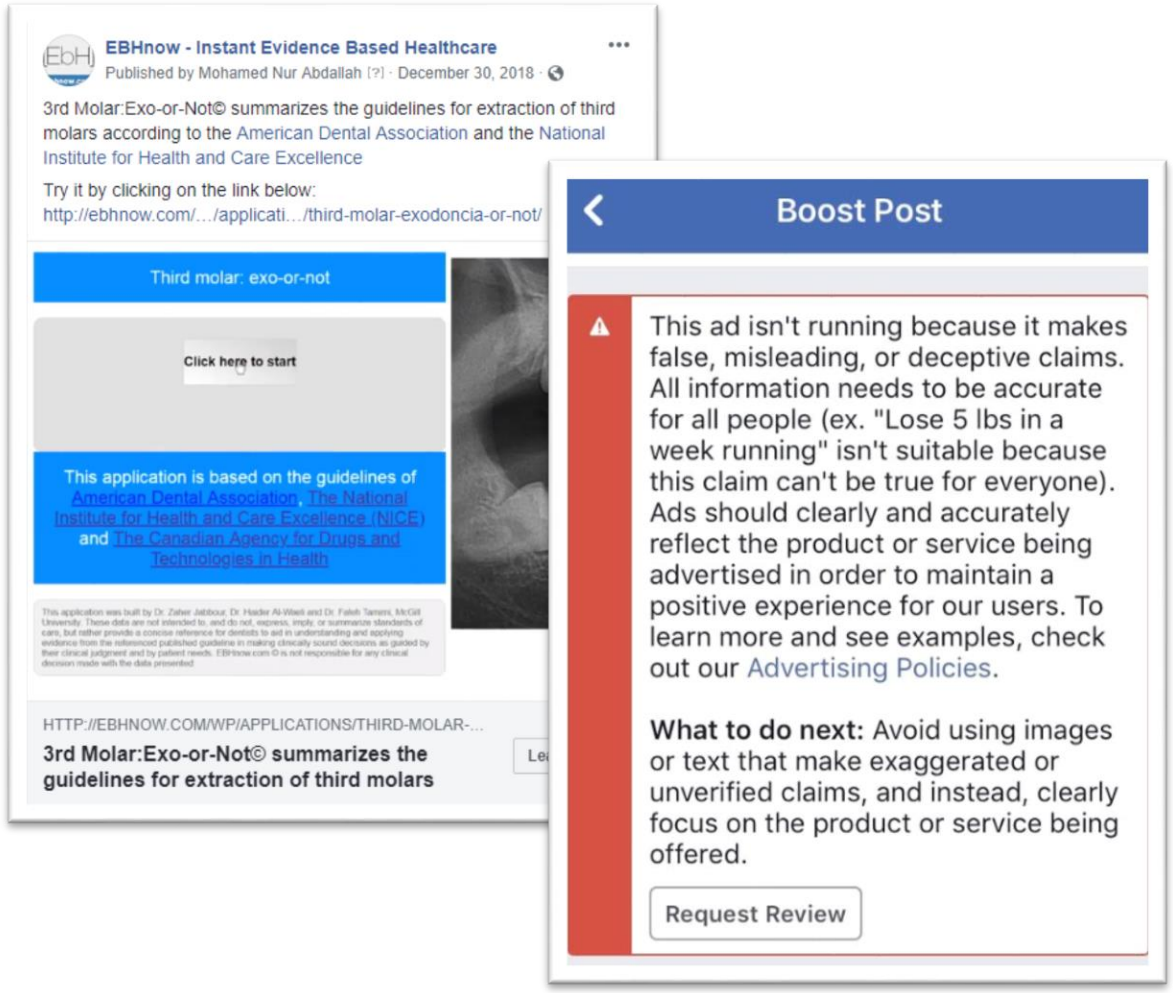
Algorithmic bias



Algorithmic bias

How is introduced ?

- By the programmers
- By Design
- Not representative training data
- False Correlations
- Feedback loop

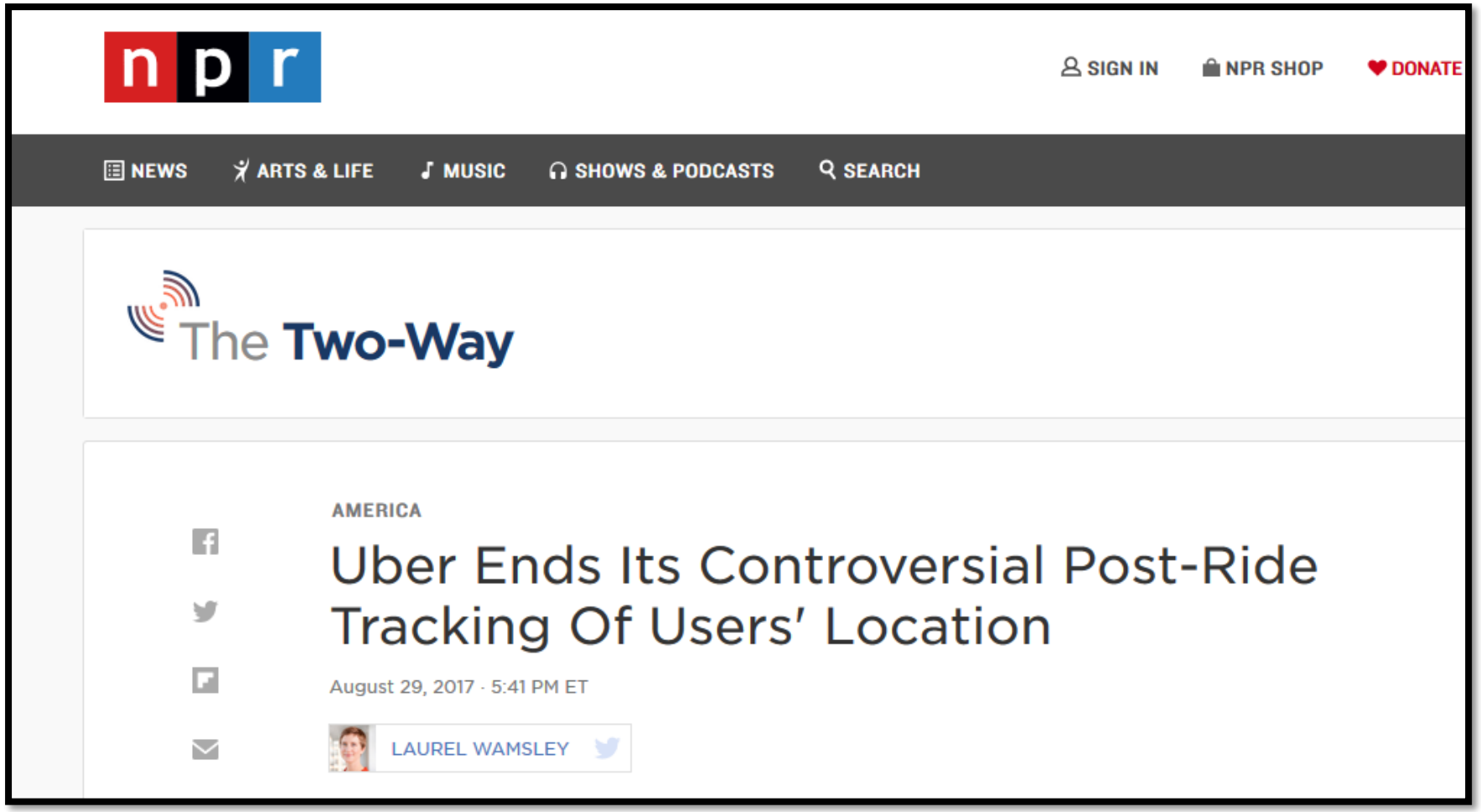


Societal impact


face
The Guardian


ctrl shift face


ctrl shift face



> Allowing Uber to always track one's location didn't seem great either, given that this was the same company that announced in 2012 it had scoured user data and calculated the prevalence of one-night stands.

https://www.npr.org/sections/thetwo-way/2017/08/29/547113818/uber-ends-its-controversial-post-ride-tracking-of-users-location

It’s all fun and games until…

Bloomberg

Politics

Amazon Pitches Facial Recognition to Monitor Immigrants

By Spencer Soper

October 23, 2018, 4:53 PM EDT *Updated on October 23, 2018, 7:56 PM EDT*

- Company officials met with U.S. ICE to discuss technology
- Critics say artificial intelligence in surveillance is risky

https://www.bloomberg.com/news/articles/2018-10-23/amazon-pitches-facial-recognition-tools-to-monitor-immigrants

The New York Times

ICE Used Facial Recognition to Mine State Driver's License Databases

Vermont is one of at least three states where Immigration and Customs Enforcement officials asked to comb through driver's license photos. Toby Talbot/Associated Press

By Catie Edmondson

July 7, 2019

852

WASHINGTON — Immigration and Customs Enforcement officials have mined state driver's license databases using facial recognition technology, analyzing millions of motorists' photos

https://www.nytimes.com/2019/07/07/us/politics/ice-drivers-licenses-facial-recognition.html

EXCLUSIVE ENTERTAINMENT

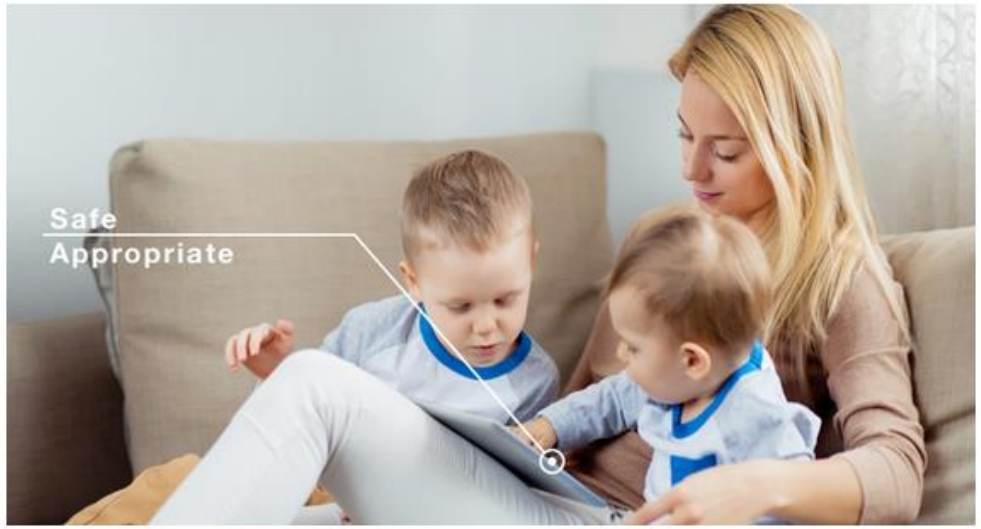
Netflix Plays New Role: Budget-Conscious

By Jessica Toonkel, Tom Dotan and Beejoli Shah Jul 01, 2019 7:01 AM PDT · Comment by Martha Josephson

In early June, Netflix content chief Ted Sarandos met with several dozen of his middle-ranking and senior film and TV executives and delivered a blunt message: Be more careful with money.

Mr. Sarandos told the group that spending on film and TV projects, particularly big budget movies, needed to be more cost-effective, according to people familiar with the meeting. Netflix has long measured the efficiency of its TV shows and movies using a ratio of their cost to a measure of viewership that gives more weight to new subscribers and those viewed at risk of canceling, say former employees. Mr. Sarandos made clear that in the future big-budget projects should bring in lots of viewers, a shift from the past when they might have gotten a pass if they were expected to get buzz and build

The stars of Netflix's "Triple Frontier" movie at a premiere screening in Madrid. Photo by AP



Unsafe content detection

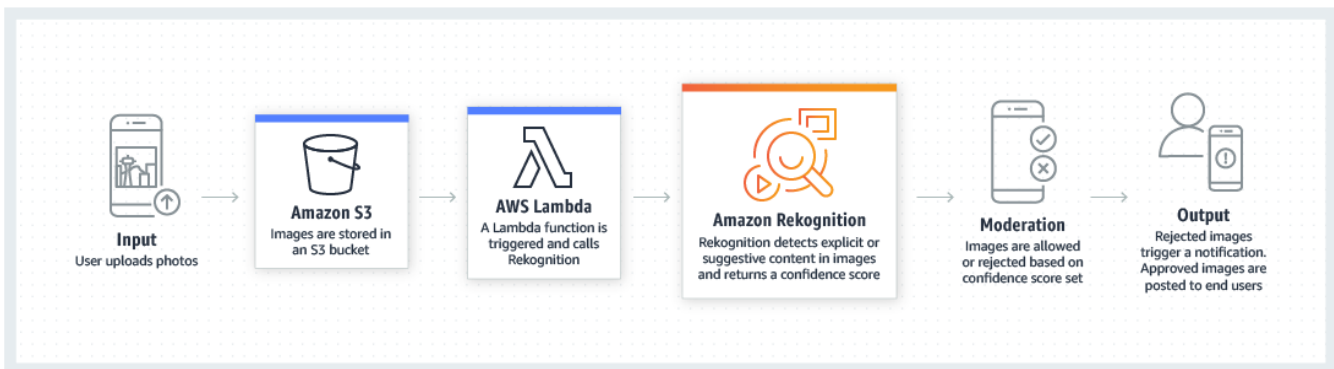
Amazon Rekognition helps you identify potentially unsafe or inappropriate content across both image and video assets and provides you with detailed labels that allow you to accurately control what you want to allow based on your needs.

https://aws.amazon.com/rekognition/

Image moderation

Amazon Rekognition allows you to automatically detect inappropriate content in images using the Image Moderation API. The API returns a confidence score for a detailed set of content categories, which allows you to create your own rules around what is appropriate for the culture and demographics of your users. Get started »

Example: Moderating user uploaded images



Facial analysis

You can analyze the attributes of faces in images and videos you provide to determine things like happiness, age range, eyes open, glasses, facial hair, etc. In video, you can also measure how these things change over time, such as constructing a timeline of the emotions of an actor.

https://aws.amazon.com/rekognition/

Sentiment analysis

Amazon Rekognition can detect emotions like happy, sad, or surprised from facial images. Rekognition can analyze live images, and send the emotion attributes to Redshift for periodic reporting on trends for each store location.

Example: Retail store sentiment analysis

Face-based user verification

With Amazon Rekognition, your applications can confirm user identities by comparing their live image with a reference image.

Example: Employee badge scan

ARMED™ is dedicated to the development and integration of cutting-edge technology to combat acts of political violence, terrorism, organized criminal activities, and insider threats.

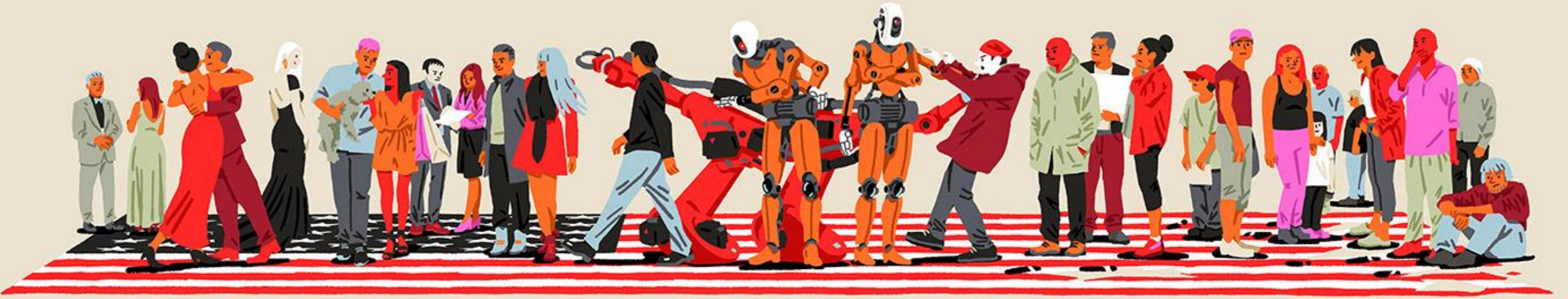
Uluru leverages the cloud to make parents' and teachers' lives easier. Specifically, their "En Photo" offering reduces the effort required to identify photos of kindergarteners and other schoolchildren so parents can purchase these photos.

https://aws.amazon.com/rekognition/


Tengai
Unbiased
https://www.tengai-unbiased.com

“…neutrality is impossible. In any situation, there exists a distribution of power. “

-The Myth of the Neutral Profession by Robert Jensen



http://www.fatml.org/

Fairness, Accountability, and Transparency in Machine Learning

Bringing together a growing community of researchers and practitioners concerned with fairness, accountability, and transparency in machine learning

The past few years have seen growing recognition that machine learning raises novel challenges for ensuring non-discrimination, due process, and understandability in decision-making. In particular, policymakers, regulators, and advocates have expressed fears about the potentially discriminatory impact of machine learning, with many calling for further technical research into the dangers of inadvertently encoding bias into automated decisions.

At the same time, there is increasing alarm that the complexity of machine learning may reduce the justification for consequential decisions to "the algorithm made me do it."

The annual event provides researchers with a venue to explore how to characterize and address these issues with computationally rigorous methods.

https://www.bbc.com/news/technology-45561955

Technology

IBM launches tool aimed at detecting AI bias

By Zoe Kleinman
Technology reporter, BBC News

19 September 2018

Share

Algorithms and machine-learning could increasingly be used to calculate things like car insurance

Top Stories

US gangster 'Whitey' Bulger found dead
James 'Whitey' Bulger, the Boston gangster whose life inspired films, was reportedly killed in jail.
26 minutes ago

Synagogue shooting victims' funerals start
21 minutes ago

A woman trying to make history
7 hours ago

Features

Some truths about Trump's birthright plan

Gender Shades | The Coded Gaze | AI, Ain't I A Woman | Fight Bias | Newsletter | GET INVOLVED

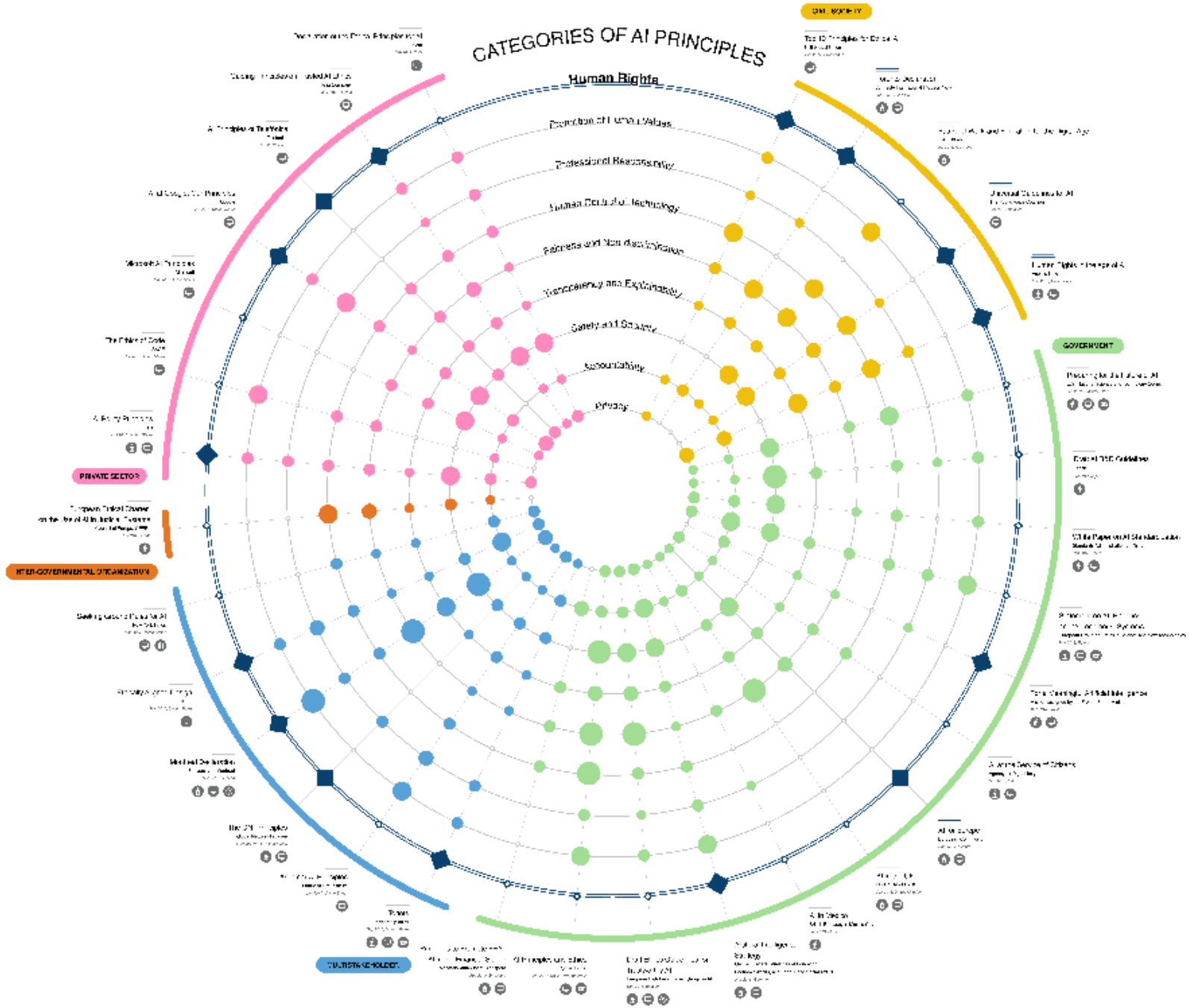
https://www.ajlunited.org

ALGORITHMIC JUSTICE LEAGUE

The European Commission's

HIGH-LEVEL EXPERT GROUP ON ARTIFICIAL INTELLIGENCE

DRAFT
ETHICS GUIDELINES FOR TRUSTWORTHY AI


CATEGORIES OF AI PRINCIPLES
Human Rights
Promotion of Human Values
Professional Responsibility
Human Control of Technology
Fairness and Non-discrimination
Transparency and Explainability
Safety and Security
Accountability
Privacy
CIVIL SOCIETY
GOVERNMENT
PRIVATE SECTOR
INTER-GOVERNMENTAL ORGANIZATIONS
MULTISTAKEHOLDER

Practical application

Text Mining

Overall Process

1. Data Gathering
2. Pre processing
   - Getting the data ready
   - Attribute Generation
   - Attribute Selection
3. Data Mining
4. Interpretation and evaluation

Text Mining

https://github.com/fberrizbeitia/ai-workshop-2019

Experiments

- Create, save and evaluate the following models:
  - Female only data
  - Male only data
  - Both gender data

- Compare the results of each model using different gender test set

Discussion

Hacker ~~Ethic~~Questions

- ~~Access to computers should be unlimited and total.~~ Who gets to use what I make? Who am I leaving out? How does what I make facilitate or hinder access?

- ~~All information should be free.~~ What data am I using? Whose labor produced it and what biases and assumptions are built into it? Why choose this particular phenomenon for digitization/transcription? What do the data leave out?

- ~~Mistrust authority – promote decentralization.~~ What systems of authority am I enacting through what I make? What systems of support do I rely on? How does what I make support other people?

- ~~Hackers should be judged by their hacking, not bogus criteria such as degrees, age, race or position.~~ What kind of community am I assuming? What community do I invite through what I make? How are my own personal values reflected in what I make?

opentranscripts.org/transcript/programming-forgetting-new-hacker-ethic/

Activity

- What industry are you working/studying in?
- Does that industry have a code of ethics, collective principles, best practices, etc?
- Based on your industry, propose an action plan for those in your field to uphold these principles while engaging with technology.
- Consider how the actions may change as technology continues to advance, but remain centred on the principles you choose
    - Example:
        - If you were an engineer building a system for a tech company, how would the selected principles inform your work? How would your knowledge re: technological advances influence your practice?
        - How would this be different if you were high school teacher? A psychologist? An accountant?

Learn More

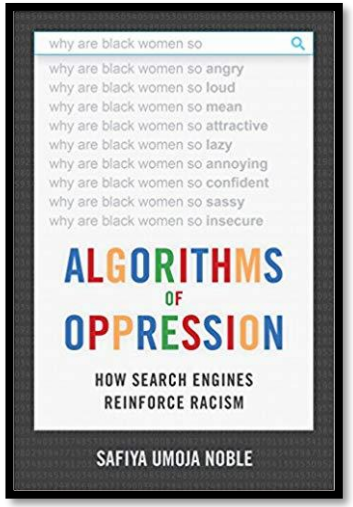
Participate

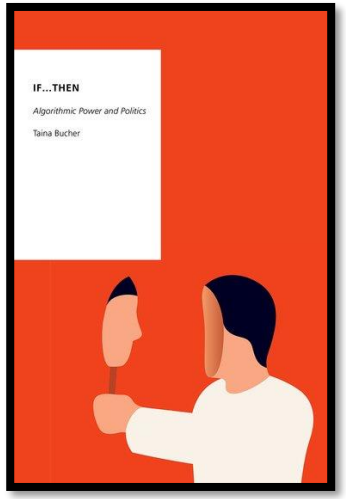
- Algorithmic Media Observatory
- Montreal AI Ethics Institute

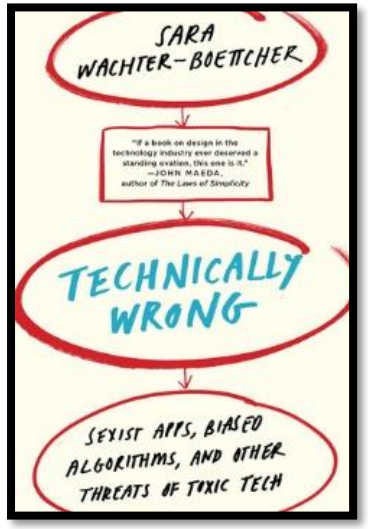
Watch

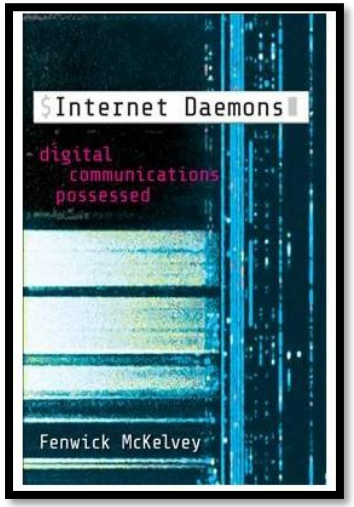
- Slavin, K. (2012). *How algorithms shape our world*. Retrieved from https://www.youtube.com/watch?v=ENWVRcMGDoU&feature=youtu.be
- Tufekci, Z. (2017). *We're building a dystopia just to make people click on ads*. Retrieved from https://www.youtube.com/watch?v=iFTWM7HV2UI
- Wachter-Boettcher, S. (2018). *Inclusive Content, Ethical Design, and All of Us - 2018 Design & Content Conference*. Retrieved from https://vimeo.com/286621614

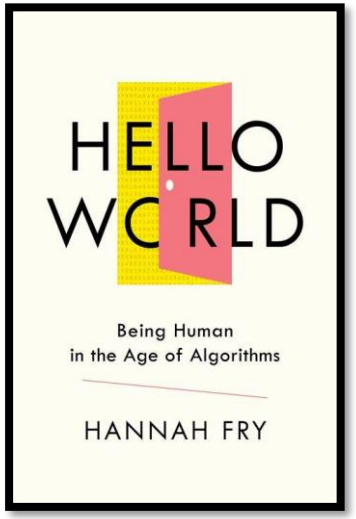
Read

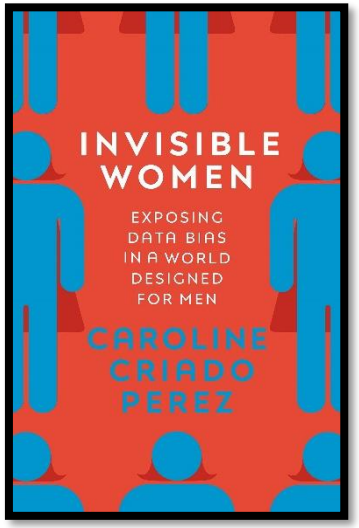












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Thank you for coming