

# computational social media

## lecture 8: society

daniel gatica-perez

# announcements

assignment #4 will be discussed today

reading #9 & reading #10 will be presented today

K. Yang, K. Qinami, L. Fei.-Fei, J. Deng, and O. Russakovsky  
Towards Fairer Datasets: Filtering and Balancing the Distribution of the  
People Subtree in the ImageNet Hierarchy  
Proc. ACM FAT\* 2020.

B. Koch, E. Denton, A. Hanna, J. Gates Foster  
Reduced, Reused and Recycled: The Life of a Dataset in ML Research  
Proc. NeurIPS, 2021.

# last reminder: project presentation day (10.06.2022)

09:00-09:45 group 1

09:45-10:30 group 2

10:30-10:45 break

10:45-11:30 group 3

11:30-12:15 group 4

12:15-13:00 lunch break

13:00-13:45 group 5

13:45-14:30 group 6

14:30-14:45 break

14:45-15:30 group 7

+ everybody is invited to attend the full day

+ please reserve the slot for your team

+ room: **ELD020**

# last reminder: project presentation & report

## presentation

- each team has 45-min slot: 25-min talk + 20 mins for questions
- all team members are expected to present
- each member's contribution needs to be explained (who did what)
- structure: intro, goals, data, methods, results & discussion, conclusion

## report

- ACM conference paper format: 6 double-column pages + references (not counted in 6-pp.) + appendices (if needed, not counted in 6-pp.)
- latex template available (ask your project mentor in case of questions): <https://www.acm.org/publications/proceedings-template>
- structure: abstract, introduction, data, methods, results & discussion, conclusion, references
- introduction: include project goals and description of each team member's contribution (who did what and who wrote what)
- a collaborative tool like overleaf is recommended
- submit slides & report by **Fri 17.06.2022, 7pm**

# **this lecture**

**1. introduction**

2. the world is big

3. open issues

# 1. introduction

**We shape our tools,  
and thereafter our tools shape us**

Marshall McLuhan, media theorist, 1960s

2012

# NETWORKED

THE NEW  
SOCIAL  
OPERATING  
SYSTEM

LEE RAINIE AND BARRY WELLMAN

2015

danah boyd

# It's Complicated

the social lives of networked teens







2018



# AMERICAN VIEWS: TRUST, MEDIA AND DEMOCRACY

A GALLUP/KNIGHT FOUNDATION SURVEY

“Americans are highly concerned about the effects of “fake news” on democracy, ... They are concerned about the role that tech companies plays in news,”



<https://www.youtube.com/watch?v=Y7DfLvLKScs>



2019

## San Francisco's facial recognition ban is just the beginning of a national battle over the technology

“Our traditional secrecy and lack of transparency has probably come back to haunt us,” the president of the National Police Foundation said.

May 20, 2019, 10:48 AM GMT+2

By Jon Schuppe

<https://www.nbcnews.com/news/us-news/san-francisco-s-facial-recognition-ban-just-beginning-national-battle-n1007186>

# this lecture

1. introduction
- 2. the world is big**
3. open issues

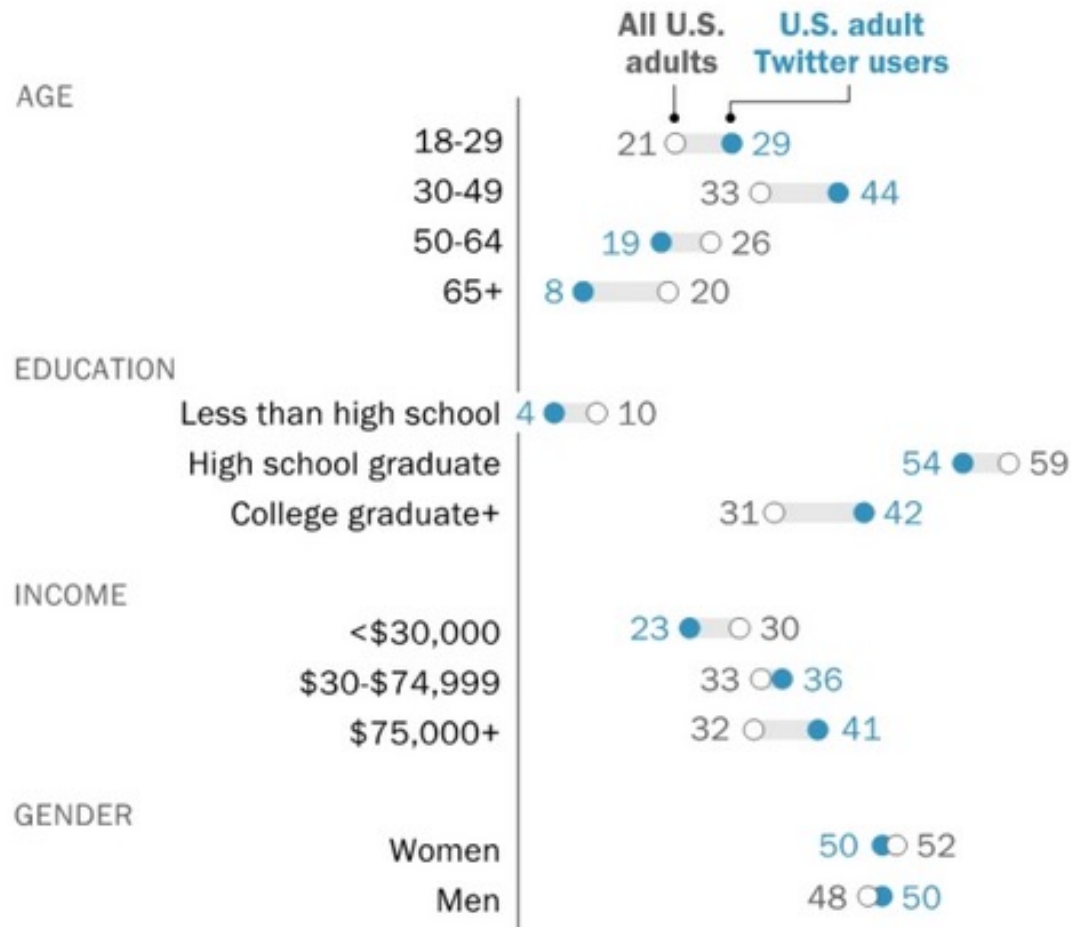
## **2. the world is big**

# Twitter is not everybody

## Representative survey of US adult Twitter users (N=2791)

### Twitter users are younger, more highly educated and wealthier than general public

% of \_\_\_\_\_ who are ...



# 25 largest urban areas in the world

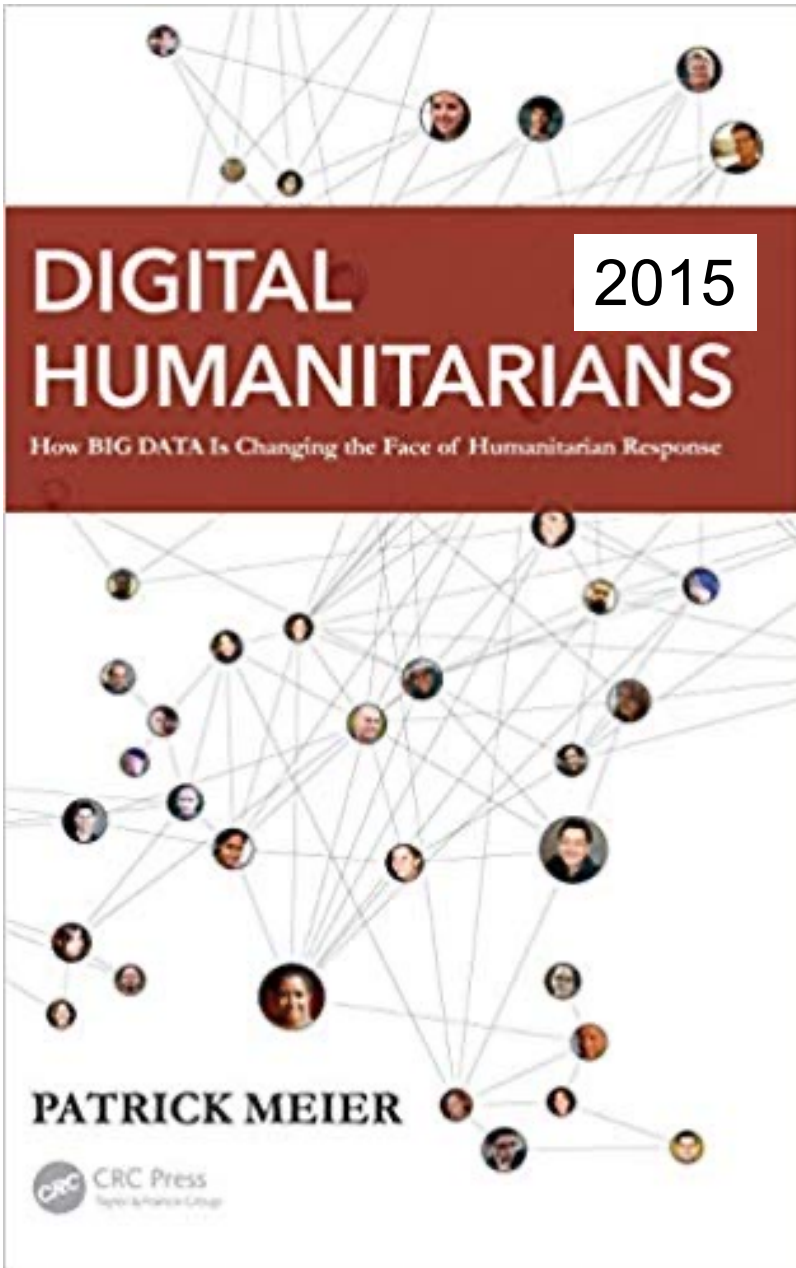
5 are in the “Global North”  
20 in the rest of the world  
4 in China  
3 in India

1. Tokyo-Yokohama
2. Jakarta
3. Delhi
4. Manila
5. Seoul-Incheon
6. Shanghai
7. Mumbai
8. New York City
9. Beijing
10. Sao Paulo
11. Mexico City
12. Guangzhou–Foshan
13. Dhaka
14. Osaka-Kobe-Kyoto
15. Moscow
16. Cairo
17. Bangkok
18. Los Angeles
19. Buenos Aires
20. Kolkata
21. Istanbul
22. Tehran
23. Lagos
24. Tianjin
25. Karachi

2011



credit (cc): Ahmad Hammoud @ flickr, 31.01.2011,  
<https://www.flickr.com/photos/ahmadhammoudphotography/>



“Digital humanitarians are volunteers and professionals from the world over.... In real-time, they make sense of vast volumes of social media and imagery captured from satellites and UAVs to support relief efforts worldwide. They craft and leverage ingenious crowdsourcing solutions with insights from AI.”

What about everyday life phenomena?

# Nairobi, Kenya (population: 6.5 million, metro area)



Image by Nahashon Diaz from Pixabay  
<https://pixabay.com/photos/nairobi-kenya-streets-matatu-urban-2770340/>



All the info you need to easily get from point A to B



Tweets  
**731K**

Following  
**9,506**

Followers  
**1.08M**

Likes  
**570**

Lists  
**1**

Follow

**Ma3Route** ✓

@Ma3Route

A mobile, web and SMS platform that helps citizens to share and access info about transport and current traffic conditions for their city.

[#BeatInconvenience](#)

📍 Kenya

Platform that uses mobile & social to crowdsource transit reports

Aggregates citizen reports (Twitter & app)

Reports consist mainly of text and images. Users use road names and other well known landmarks to locate their reports

Strong local community: over 1M Twitter followers

# topic modeling

Topic	Most Relevant Words
T1	sacco, matatus, driver, embassava, passeng, wrong, bus, shame, reckless, loud, suspend
T2	police, fire, bribe, offic, traffic, cop, fuel, light, car, arrest, collect, motorist, law, corrupt
T3	obama, road, close, mombasa, day, friday, nairobi, time, grass, uhuru, visit, kidero
T4	accid, involv, car, lorri, caus, hit, road, truck, bypass, polic, dead, injury, scene, bus
T5	drive, speed, safeti, cross, pedestrian, #zushaleo, safe, road, limit, life, #trafficwatch, drink

Matatus (minibuses)

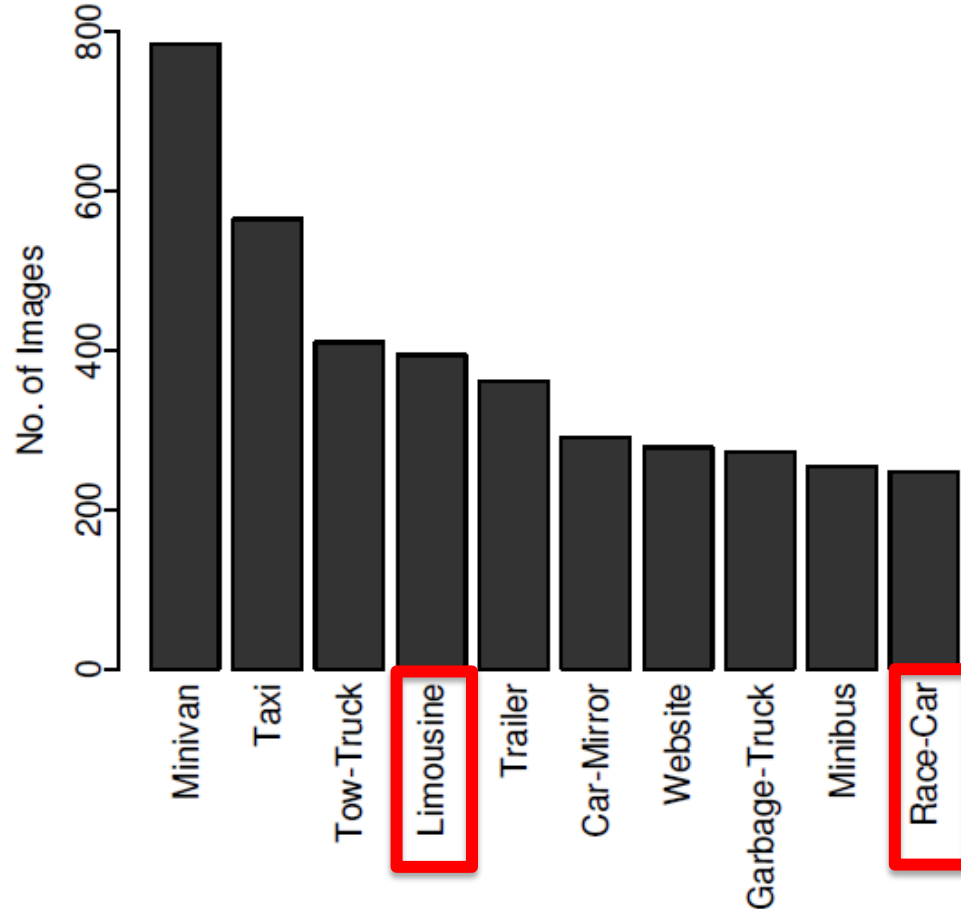
Police issues

Obama's visit

Accidents

Safety advice

# Nairobi's traffic as seen by machines



Top-10 object categories extracted from Ma3Route images  
(ImageNet pre-trained CNN)

# large-scale image sources are not representative

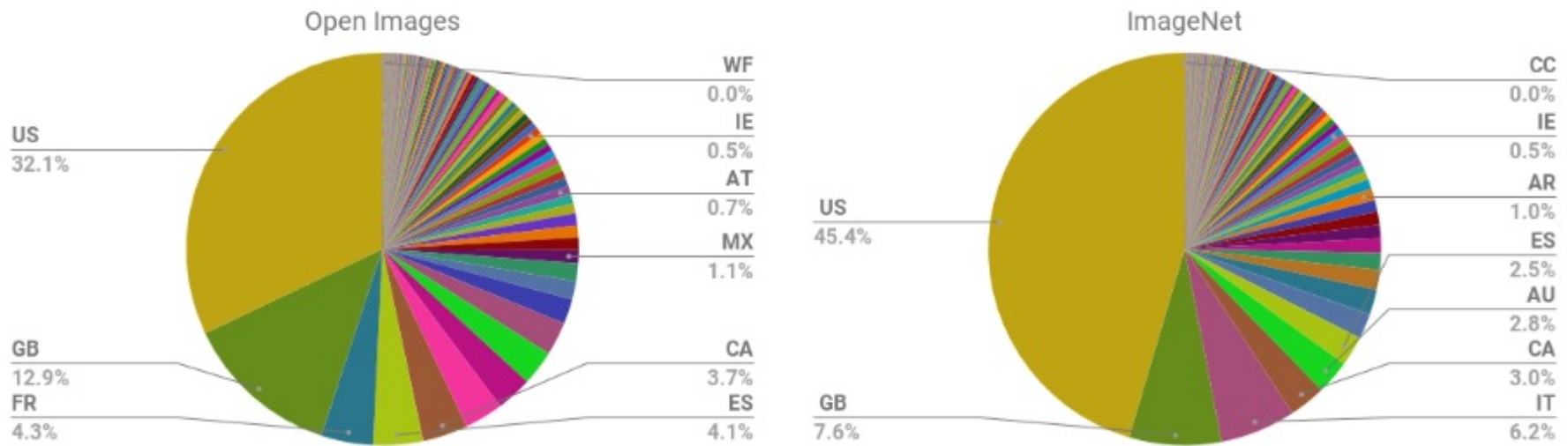


Figure 1: Fraction of Open Images and ImageNet images from each country. In both data sets, top represented locations include the US and Great Britain. Countries are represented by their two-letter ISO country codes.

# measuring the impact of geographical bias



Ground truth: Spices      Philippines, 262 \$/month

**Azure:** bottle, beer, counter, drink, open

**Clarifai:** container, food, bottle, drink, stock

**Google:** product, yellow, drink, bottle, plastic bottle

**Amazon:** beverage, beer, alcohol, drink, bottle

**Watson:** food, larder food supply, pantry, condiment, food seasoning

**Tencent:** condiment, sauce, flavorer, catsup, hot sauce



Ground truth: Spices      USA, 4559 \$/month

**Azure:** bottle, wall, counter, food

**Clarifai:** container, food, can, medicine, stock

**Google:** seasoning, seasoned salt, ingredient, spice, spice rack

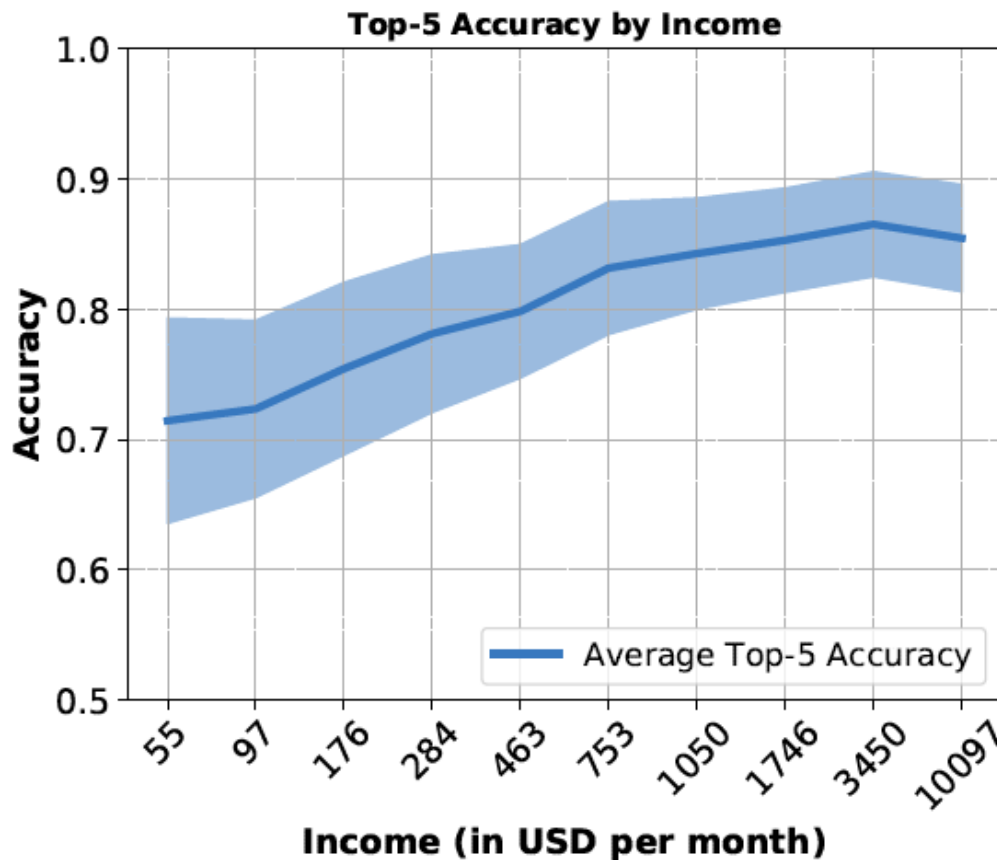
**Amazon:** shelf, tin, pantry, furniture, aluminium

**Watson:** tin, food, pantry, paint, can

**Tencent:** spice rack, chili sauce, condiment, canned food, rack

“Images of household items across the world, and classes recognized by commercial image-recognition systems. Systems tend to perform worse in non-Western countries and for households with lower incomes”.

## measuring the impact of geographical bias (2)



“The Dollar Street image dataset was collected with the goal of making ‘everyday life on different income levels understandable’: 135 different classes taken in 264 homes across 54 countries.”

“Average accuracy (and sd) of six object recognition systems vs. normalized income of household where images were collected”

# social media and vulnerable populations in “Global North” countries

## Avoiding the South Side and the Suburbs: The Geography of Mobile Crowdsourcing Markets

**Jacob Thebault-Spieker**  
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ACM CSCW 2015





















## Characterizing Dietary Choices, Nutrition, and Language in Food Deserts via Social Media

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Microsoft Research  
emrek@microsoft.com

ACM CSCW 2016

WEST	CHINA
	
	  <p>Tencent is top shareholder of JD.com</p>
	
	   <p>Baidu owns iQiyi, Alibaba owns Youku, Tencent owns QQ video</p>
	 <p>Alibaba has 31.5% stake</p>
	
	   <p>Alibaba owns Ali music, Tencent owns QQ music, NetEase - China's fifth biggest internet company - owns NetEase Cloud Music</p>
	   <p>Baidu is top shareholder of Ctrip, JD.com is top 2 shareholder of tuniu.com, Alibaba owns Fliggy</p>



**AI  
SUPER-  
POWERS**  
**CHINA,  
SILICON VALLEY,  
AND THE  
NEW WORLD ORDER**  
**KAI-FU LEE**

“The AI world order will combine winner-take-all economics with an unprecedented concentration of wealth in the hands of a few companies in China and the United States. This, I believe, is the real underlying threat posed by artificial intelligence (p.21)”

Kai-Fu Lee


2018

# this lecture


1. introduction
2. the world is big
- 3. open issues**

## **3. open issues**

# social media & machine learning

Sections 

The Washington Post  
*Democracy Dies in Darkness*

Sign In 

The Switch

## AI will solve Facebook's most vexing problems, Mark Zuckerberg says. Just don't ask when or how.

By [Drew Harwell](#)

April 11, 2018




SUCCESS

MONEY

WORK

LIFE

VIDEO

SEARCH 

LIFE WITH A.I.

## Google CEO: A.I. is more important than fire or electricity

Published Thu, Feb 1 2018 • 12:56 PM EST



Catherine Clifford  
[@CATCLIFFORD](#)

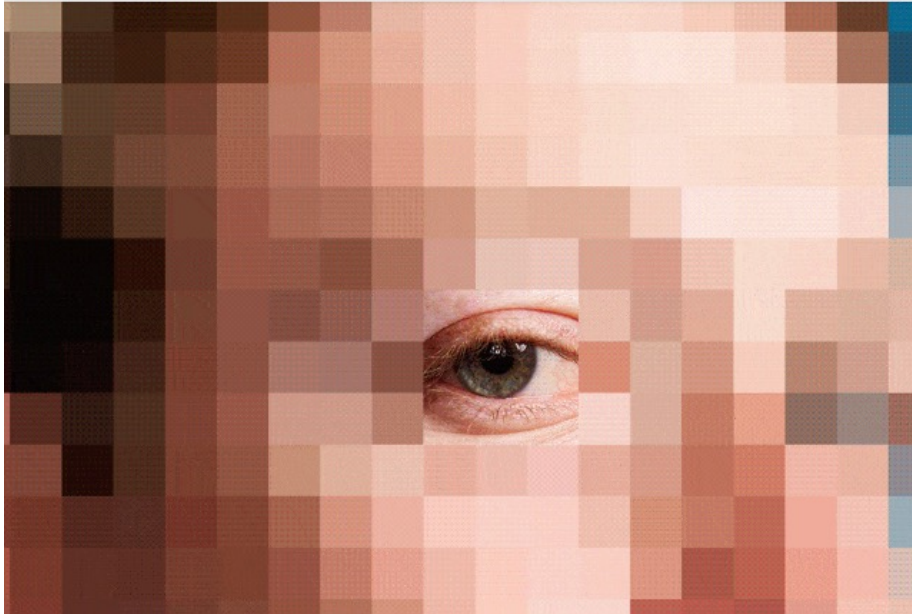
Share    

machine learning moved from the  
{objective, physical, binary, certain}  
to the  
{subjective, psychological, nuanced, uncertain}

# misinformation

THE  
NEW YORKER

News Culture Books Business & Tech Humor Cartoons Magazine Video Podcasts Archive Goings On



PROFILES

## CAN MARK ZUCKERBERG FIX FACEBOOK BEFORE IT BREAKS DEMOCRACY?

Facebook: 2B+ users

Instagram: 1B+ users

Whatsapp: 2B users

# accountability, transparency, fairness

## **accountability**

companies should be responsible for their practices involving machine learning  
algorithms should be auditable

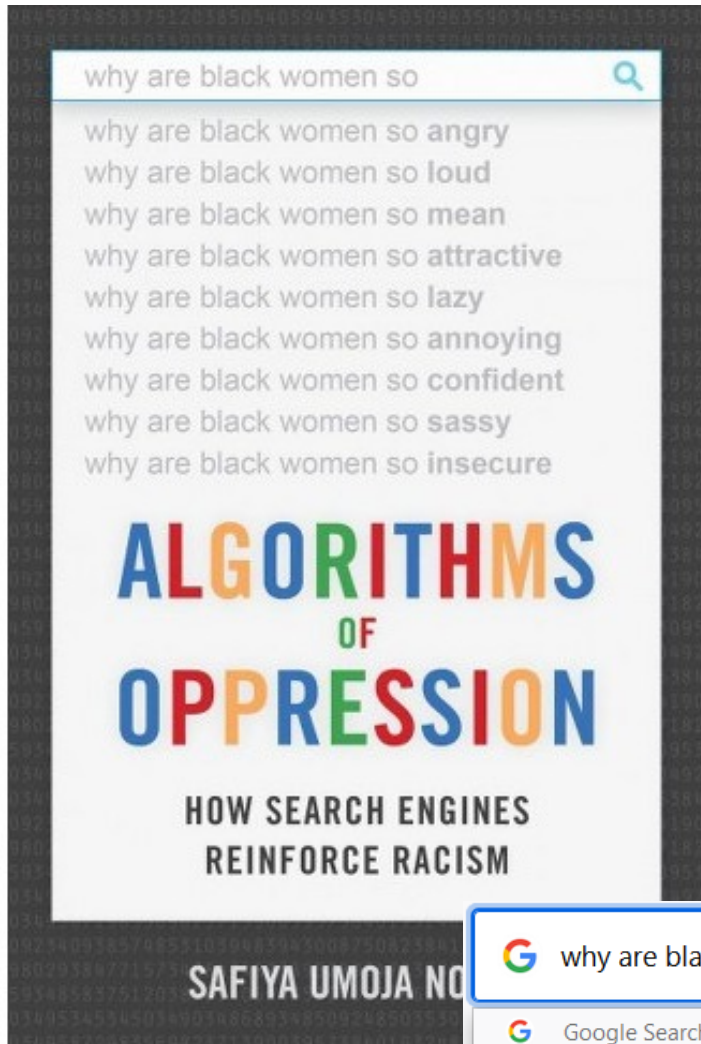
## **transparency**

people should know how machine decisions are made and where/how in the process their data is used

## **fairness**

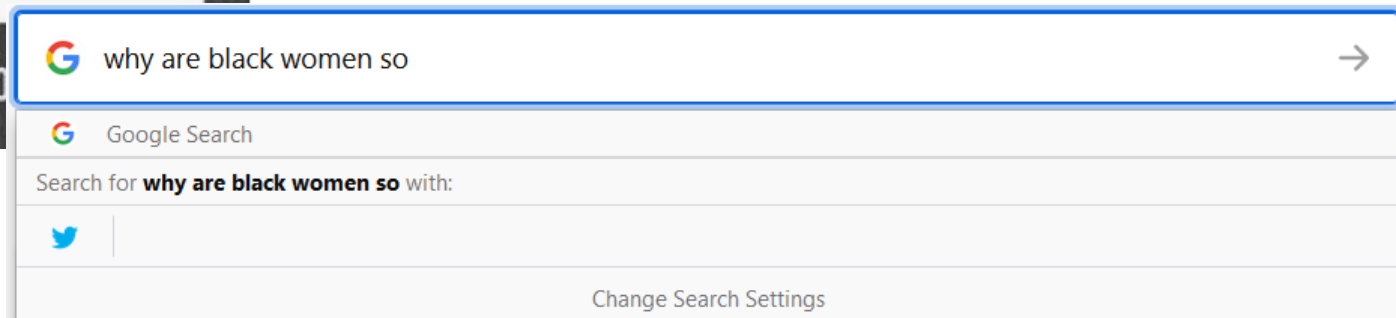
machines should be trained to give people the same chances and avoid discrimination

# accountability: one example



2018

2020







why is my husband so



why is my husband so **mean to me when he drinks**

why is my husband so **mean**

why is my husband so **lazy**

why is my husband so **angry**

why is my husband so **mean to me**

why is my husband so **annoying**

why is my husband so **gassy**

why is my husband so **selfish**

why is my husband so **moody**

why is my wife so



why is my wife so **beautiful**

why is my wife so **mean**

why is my wife so **annoying**

why is my wife so **angry**

why is my wife so **lazy**

why is my wife so **crazy**

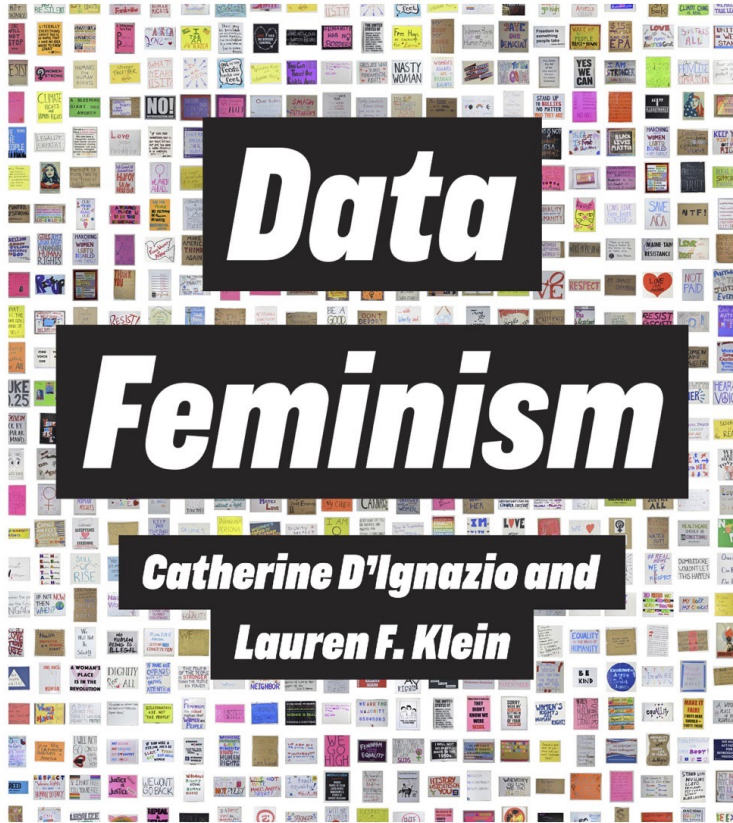
why is my wife so **rude to me**

why is my wife so **grumpy**

why is my wife so **weird**

18.05.2020

# equity



"Data Feminism offers strategies for data scientists seeking to learn how feminism can help them work toward justice, and for feminists who want to focus their efforts on the growing field of data science.

But Data Feminism is about much more than gender. It is about power, about who has it and who doesn't, and about how those differentials of power can be challenged and changed."

## 7 principles

“Examine power

Challenge power

Rethink binaries & hierarchies

Elevate emotion & embodiment

Embrace pluralism

Consider context

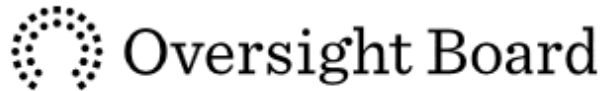
Make labor visible”

C. D'Ignazio & L. F. Klein, Data Feminism, MIT Press, 2020

Online reading group: <https://www.youtube.com/channel/UCXZOjpnQdT6nyYBFUXW8eIQ>

**who should get involved?**

# who should get involved? **companies**



## Announcing the First Members of the Oversight Board

May 06, 2020

As its community grew to more than 2 billion people, it became increasingly clear to the Facebook company that it shouldn't be making so many decisions about speech and online safety on its own. The Oversight Board was created to help Facebook answer some of the most difficult questions around freedom of expression online: what to take down, what to leave up, and why.

The board uses its independent judgment to support people's right to free expression and ensure those rights are being adequately respected. The board's decisions to uphold or reverse Facebook's content decisions will be binding, meaning Facebook will have to implement them, unless doing so could violate the law.

<https://www.oversightboard.com/>

# Machine Learning Fairness

As an AI-first company, Google aims to develop the benefits of machine learning for everyone.



Building inclusive machine learning algorithms is crucial to help make the world's information universally useful and accessible. Google researchers are working in this area,

# Think fairness. Build for everyone.

A toolkit to assess and improve the fairness of machine learning models.

**Assess**   **Mitigate**

Use common **fairness metrics** and an **interactive dashboard** to assess which groups of people may be negatively impacted.

Get Started

API Docs



<https://fairlearn.github.io/>  
<https://github.com/fairlearn/fairlearn>

## who should get involved? **governments**

### European General Data Protection Regulation (GDPR)

“(71) The data subject should have the right not to be subject to a decision, which may include a measure, evaluating personal aspects relating to him or her which is based solely on automated processing and which produces legal effects concerning him or her or similarly significantly affects him or her, such as automatic refusal of an online credit application or e-recruiting practices without any human intervention [...] In any case, such processing should be subject to suitable safeguards, which should include specific information to the data subject and the right to obtain human intervention, to express his or her point of view, to obtain an explanation of the decision reached after such assessment and to challenge the decision. “



**Justin Trudeau** ✓

@JustinTrudeau

Follow



Social media platforms must be held accountable for the hate speech & disinformation we see online – and if they don't step up, there will be consequences. We launched Canada's new Digital Charter today to guide our decisions, learn more about it here: [bit.ly/2YGiTuu](https://bit.ly/2YGiTuu)



12:08 PM - 21 May 2019

946 Retweets 3,742 Likes





# who should get involved?

## engineers, scholars, civil society

“Governments need to regulate AI by expanding the powers of sector-specific agencies to oversee, audit, and monitor technologies by domain.

The AI industry needs new approaches to governance. Internal governance structures at most technology companies are failing to ensure accountability for AI systems.

Fairness, accountability, and transparency in AI require a detailed account of the ‘full stack supply chain’.

Consumer protection agencies should apply “truth-in-advertising” laws to AI products and services.

University AI programs should expand beyond computer science and engineering disciplines.”

**what to do?**

# #1: improve data & algorithm pipelines

## example: our papers today

K. Yang, K. Qinami, L. Fei.-Fei, J. Deng, and O. Russakovsky  
Towards Fairer Datasets: Filtering and Balancing the Distribution of the People  
Subtree in the ImageNet Hierarchy  
Proc. ACM FAT\* 2020.

B. Koch, E. Denton, A. Hanna, J. Gates Foster  
Reduced, Reused and Recycled: The Life of a Dataset in ML Research  
Proc. NeurIPS, 2021.

## #2: define action lists

### example: crowdsourced labor

#### technical fixes

**communication:** provide APIs to facilitate communication among workers

**networking:** create a professional network to build communities among workers

**collaboration:** enable “flash teams” for full pipeline of work, including content moderation

#### social fixes

**accountability:** pledge to work with vendors that guarantee “good work code”

**categorization:** define job categories that properly reflect crowdwork

**recognition:** create third-party registry for crowdworkers to build resumes and reputation

# #3: test & validate action lists

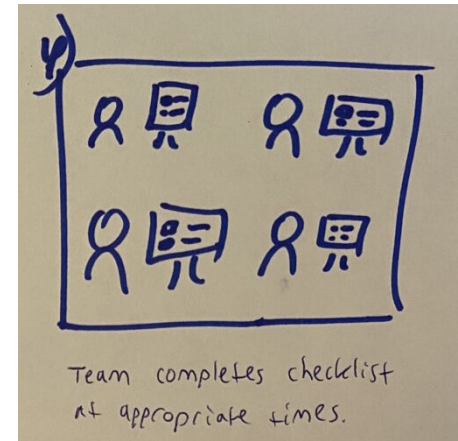
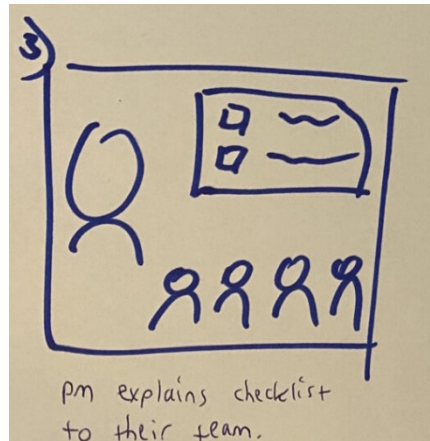
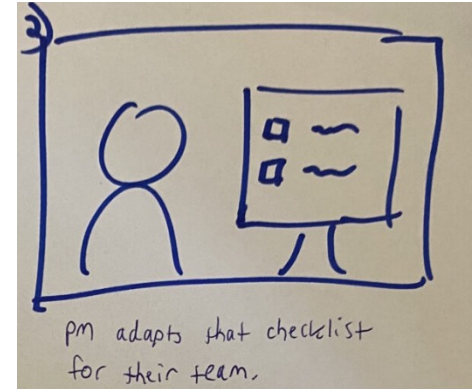
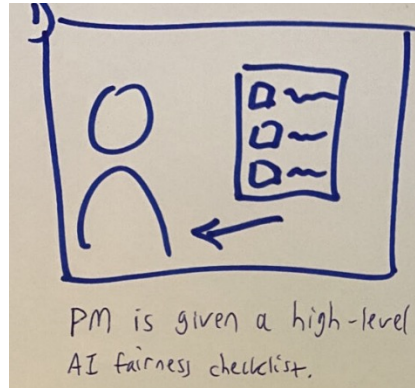
## example: fairness in AI

“Iterative co-design process with 48 practitioners from 12 tech companies, working on 37 products & services (interviews and workshops)”

“Co-designed an AI fairness checklist”

“Practitioners believe that checklists provide organizational infrastructure for formalizing ad-hoc processes and empowering individual advocates, but only if they are aligned with teams’ existing workflows and supported by organizational culture.”

M. Madaio, L. Stark, J. Wortman Vaughan, H. Wallach, Co-Designing Checklists to Understand Organizational Challenges and Opportunities around Fairness in AI, ACM CHI, Mar. 2020



# the checklist:

## envision; define; prototype; build; launch; evolve

---

### Envision

Consider doing the following items in moments like:

- Envisioning meetings
- Pre-mortem screenings
- Product greenlighting meetings

#### 1.1 Envision system and scrutinize system vision

##### 1.1.a Envision system and its role in society, considering:

- System purpose, including key objectives and intended uses or applications
  - Consider whether the system should exist and, if so, whether the system should use AI
- Sensitive, premature, dual, or adversarial uses or applications
  - Consider whether the system will impact human rights
  - Consider whether these uses or applications should be prohibited
- Expected deployment contexts (e.g., geographic regions, time periods)
- Expected stakeholders (e.g., people who will make decisions about system adoption, people who will use the system, people who will be directly or indirectly affected by the system, society), including demographic groups (e.g., by race, gender, age, disability status, skin tone, and their intersections)
- Expected benefits for each stakeholder group, including demographic groups
- Relevant regulations, standards, guidelines, policies, etc.

##### 1.1.b Scrutinize resulting system vision for potential fairness-related harms to stakeholder groups, considering:

- Types of harm (e.g., allocation, quality of service, stereotyping, denigration, over- or underrepresentation)
- Tradeoffs between expected benefits and potential harms for different stakeholder groups
  - Consider who the system will give power to and who it will take power from
  - Consider which expected benefits you are willing to sacrifice to mitigate potential harms

##### 1.1.c Revise system vision to mitigate any potential harms; if this is not possible, document why, along with future mitigation or contingency plans, etc., and consider aborting development

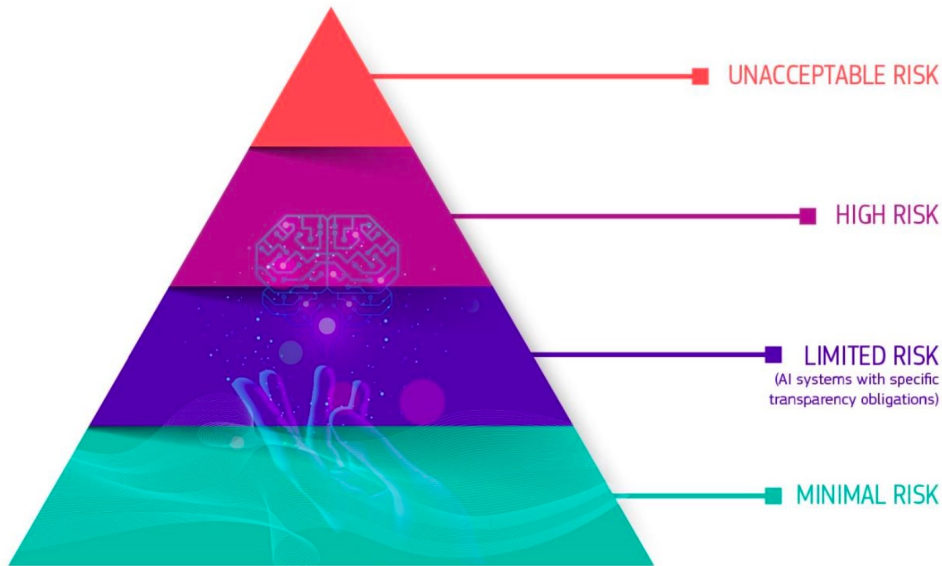
#### 1.2 Solicit input and concerns on system vision

##### 1.2.a Solicit input on system vision and potential fairness-related harms from diverse perspectives, including:

- Members of stakeholder groups, including demographic groups
    - Consider whether any stakeholder groups would prefer that the system not exist or not be deployed in all contexts, what alternatives they would prefer, and why
-

## #4: keep getting informed

### example: EU Artificial Intelligence Act (draft presented Apr 2021)



“Establishes trustworthy AI paradigm for EU.

Core rules for development and use of AI-based products & services for all industries within the EU.

Layered safety regime based on four risk categories and enforcement mechanisms (higher risk, stricter rules). Unacceptable risk applications are banned.

Requirements for market entrance and certification of **High-Risk AI Systems** through a **mandatory CE-marking procedure**, including machine learning training/ /validation/test data.”

M. Kop, EU Artificial Intelligence Act: The European Approach to AI, Stanford - Vienna Transatlantic Technology Law Forum, Transatlantic Antitrust and IPR Developments, Stanford University, Issue No. 2/2021

# final thoughts

the world is big

beware of limited machine representations of the world

think about underlying assumptions in social data & models

think about who should benefit from technology

think about implications

take action

as EPFL engineers

you have a role to play on the

technology / ethics / geography

driving social media in the machine learning age



**thank you**

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