

Data, Politics and Society

W3 – Data III: The Ugly



Where we at?

W1

W2

W3

Data: The Good, The Bad, The Ugly

W4

W5

Societal and political impacts of data and technology

Last week

The Bad

This week

The Ugly

This week

- Privacy and informed consent
- Neutrality of knowledge
- Algorithmic bias

Privacy |

Privacy fears as schools use facial recognition to speed up lunch queue

Nine schools in North Ayrshire begin using technology to take payments, with others in UK expected to follow



▲ The company supplying the technology claimed it was more Covid-secure than other systems, as it is cashless and contactless, and sped up the lunch queue. Photograph: Susan Walsh/AP

Privacy campaigners have raised concerns about the use of facial recognition technology on pupils queueing for lunch in school canteens in the UK.

Nine schools in North Ayrshire began taking payments for school lunches this week by scanning the faces of their pupils, according to a [report in the Financial Times](#). More schools are expected to follow.

The company supplying the technology claimed it was more Covid-secure than other systems, as it was cashless and contactless, and sped up the lunch queue, cutting the time spent on each transaction to five seconds.

With [break times shortening](#), schools are under pressure to get large numbers of students through lunch more quickly.

Privacy II

Google workers can listen to what people say to its AI home devices

Company admitted that contractors can access recordings made by Assistant, after some of its recordings were leaked



▲ In 2017, Google confirmed a bug in its Home Mini speaker allowed the smart device to record users even when it was not activated by the wake-up word. Photograph: Samuel Gibbs/The Guardian

Google acknowledged its contractors are able to listen to recordings of what people say to the company's artificial-intelligence system, [Google Assistant](#).

The company admitted on Thursday that humans can access recordings made by the Assistant, after some of its Dutch language recordings were leaked. [Google](#) is investigating the breach.

The recordings were obtained by [the Belgian public broadcaster VRT](#), which reviewed [more than 1,000 audio clips](#) and found 153 had been captured accidentally.

Google Assistant begins automatically recording audio when prompted by a user, usually by saying a wake-up word or phrase like, "OK, Google".

Privacy III

Some more accidents (?) with voice assistants:

- Echo Dot voice assistant spitting out fragmentary commands, seemingly based on previous interactions with the device.
- Amazon customer in Germany was mistakenly sent about 1,700 audio files from someone else's Echo, providing enough information to name and locate the unfortunate user and his girlfriend.

Future?

Shhh ... Alexa might be listening

Amazon has filed a patent that could allow its Echo devices to one day listen in on conversations to help with user recommendations. A handy feature or more fodder for conspiracy theories?



▲ Amazon's Alexa Echo may become a more proactive assistant. Photograph: Alamy Stock Photo

Should you whisper around your [Amazon](#) Echo, lest it whisper back to you?

That's the future suggested by a patent recently filed by the company, which examined the possibility of eavesdropping on conversations held around its voice-activated devices in order to better suggest products or services to users.

The idea seems to be to turn [Alexa](#), the company's virtual assistant, from a dutiful aide under the user's command to one with a more proactive attitude. For instance, the [patent suggests](#): "If the user mentions how much the user would like to go to a restaurant while on the phone, a recommendation might be sent while the user is still engaged in the conversation that enables the user to make a reservation at the restaurant."

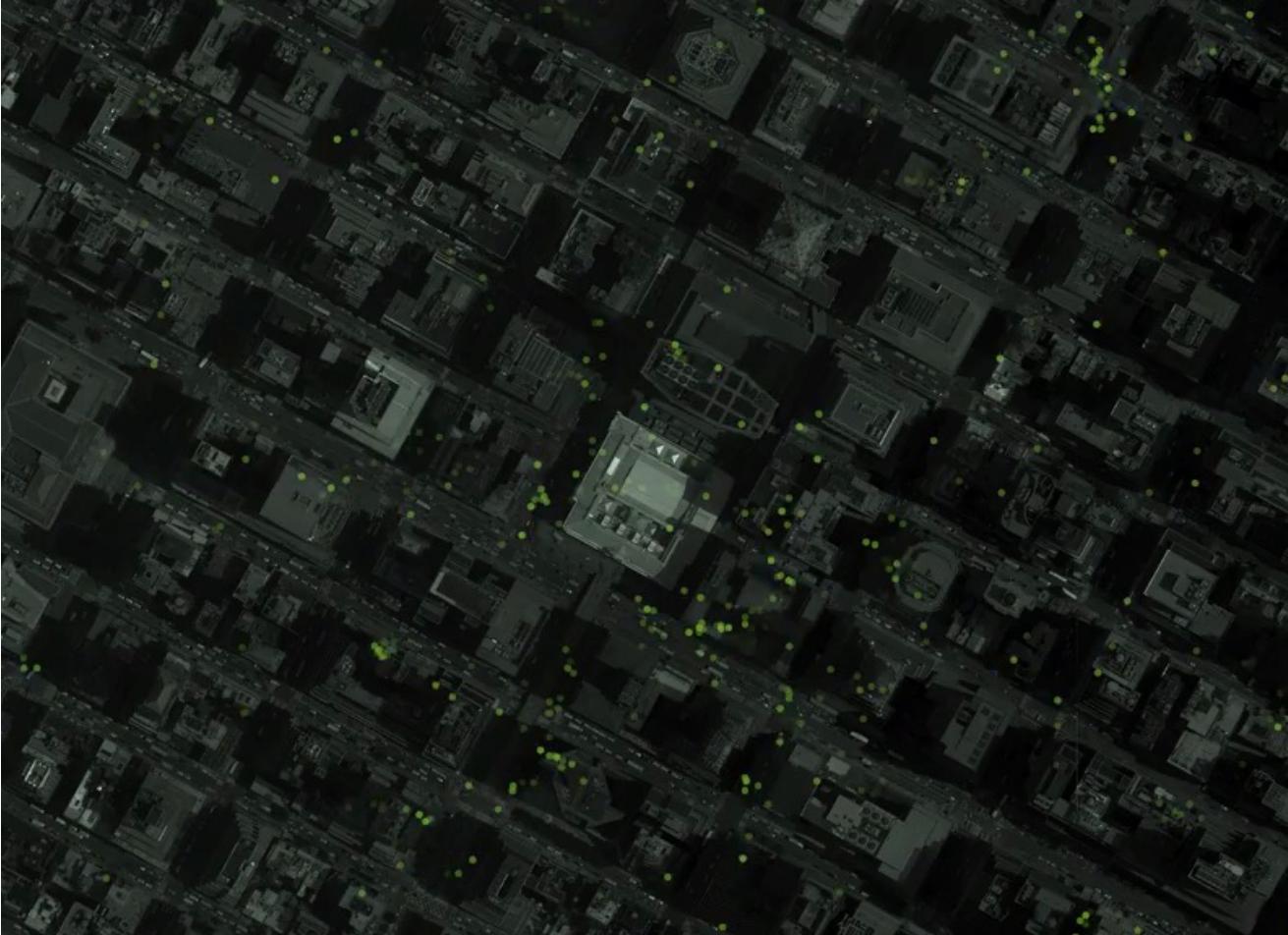
Locational privacy I

- Individual spatial data is by nature very revealing and poses significant disclosure risks.
- Disclosure risks are everywhere, but location is very specific to the field of geography
- Different to an economist's nationally representative dataset on transaction and purchasing behaviour.

Locational privacy II

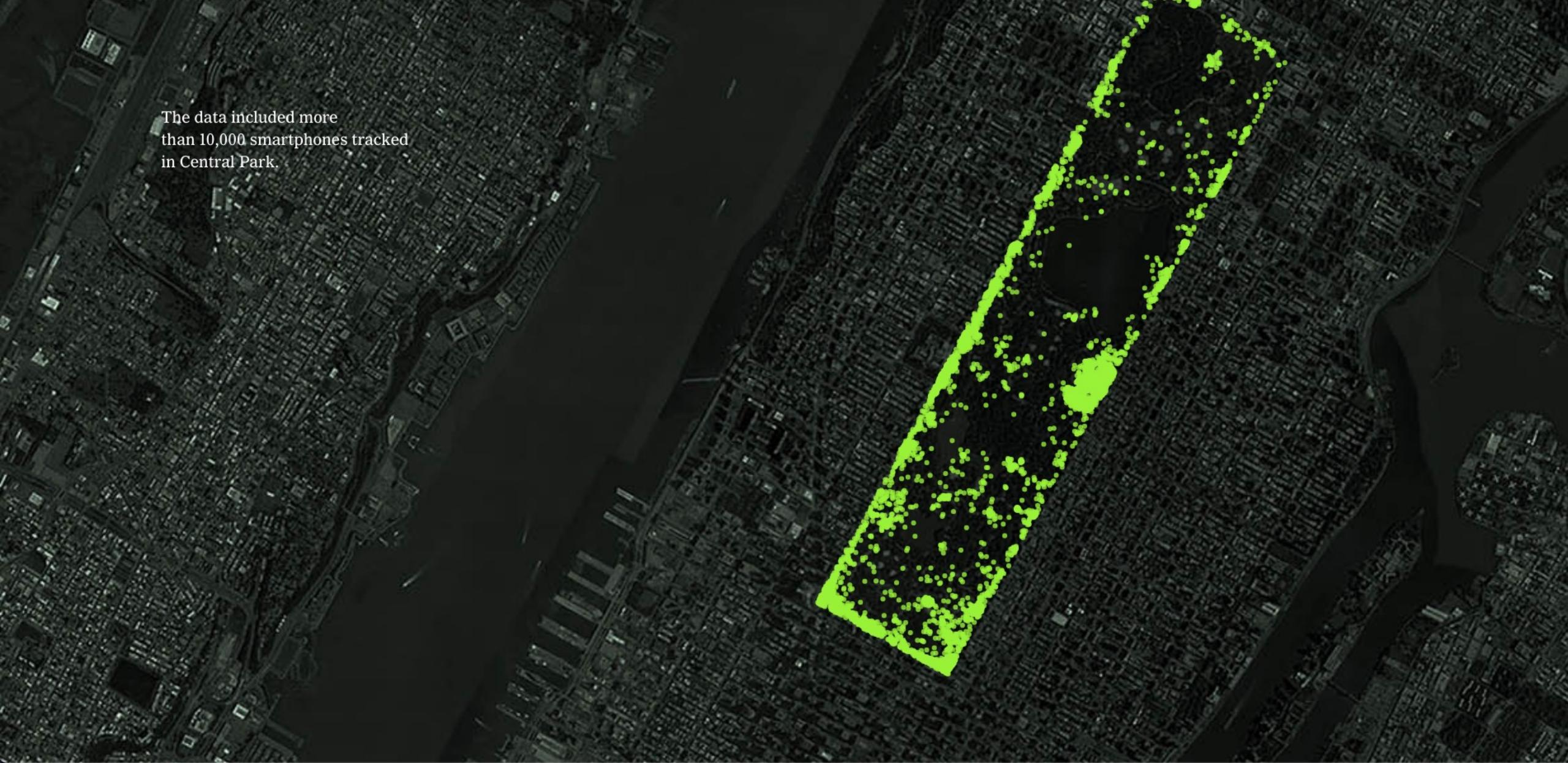
- The Privacy Project by the New York Times (2019).
- NY Times obtained a dataset comprising of more than 50 billion location pings of more than 12 million Americans as they moved through several major cities (e.g. Washington, New York, Los Angeles).
- Each piece of information in this file represents the precise location of a single smartphone over a period of several months in 2016 and 2017, data originated from a location data company (i.e. mobile applications).
- *The data was provided to Times Opinion by sources who asked to remain anonymous because they were not authorised to share it and could face severe penalties for doing so.*

The Privacy Project I



New York Times. 2019. The Privacy Project: Twelve Million Phones, One Dataset, Zero Privacy. [Online] <https://www.nytimes.com/interactive/2019/12/19/opinion/location-tracking-cell-phone.html>

The Privacy Project II

An aerial photograph of New York City, focusing on the Manhattan skyline and Central Park. The park is outlined and filled with a dense pattern of bright green dots, representing tracked smartphone locations. The surrounding urban grid is visible in shades of gray.

The data included more
than 10,000 smartphones tracked
in Central Park.

The Privacy Project III



Here is one smartphone, isolated
from the crowd.

The Privacy Project IV



Here are all pings from
that smartphone over the period
covered by the data.

The Privacy Project V



Connecting those pings reveals a diary of the person's life.

Locational privacy IV



New York Times. 2019. The Privacy Project: Twelve Million Phones, One Dataset, Zero Privacy. [Online] <https://www.nytimes.com/interactive/2019/12/19/opinion/location-tracking-cell-phone.html>

Unwilling and unknowing participants I

- Not just individual spatial data from location-based services can be very informative: social media data is another source used to generate population insights.
- Dalton and Thatcher 2015: production of consumer geographies.
- Analytics as black-boxed trade secrets.
- Classifications could reproduce those “social and geographical categories in people’s material consumptive practices” and in this way “produces the conditions for its own reproduction”.
- New ‘Big’ Data: from quantified space to quantified individuals.

Unwilling and unknowing participants II

- Cambridge Analytica and Facebook scandal 2018.
- The Times reported that in 2014 contractors and employees of Cambridge Analytica, eager to sell psychological profiles of American voters to political campaigns, acquired the private Facebook data of tens of millions of users — the largest known ‘data breach’ in Facebook history.
- CA used personal information taken without authorisation to build a system that could profile individual US voters, in order to target them with personalised political advertisements.
- Stephen Bannon, former Trump aide, was a board member of the company.

Informed consent

In a research setting:

- purpose of the research
- type of research intervention, e.g. questionnaire, interview, etc.
- voluntary nature of participation
- benefits and risks of participating
- procedures for withdrawal from the study
- usage of the data during research

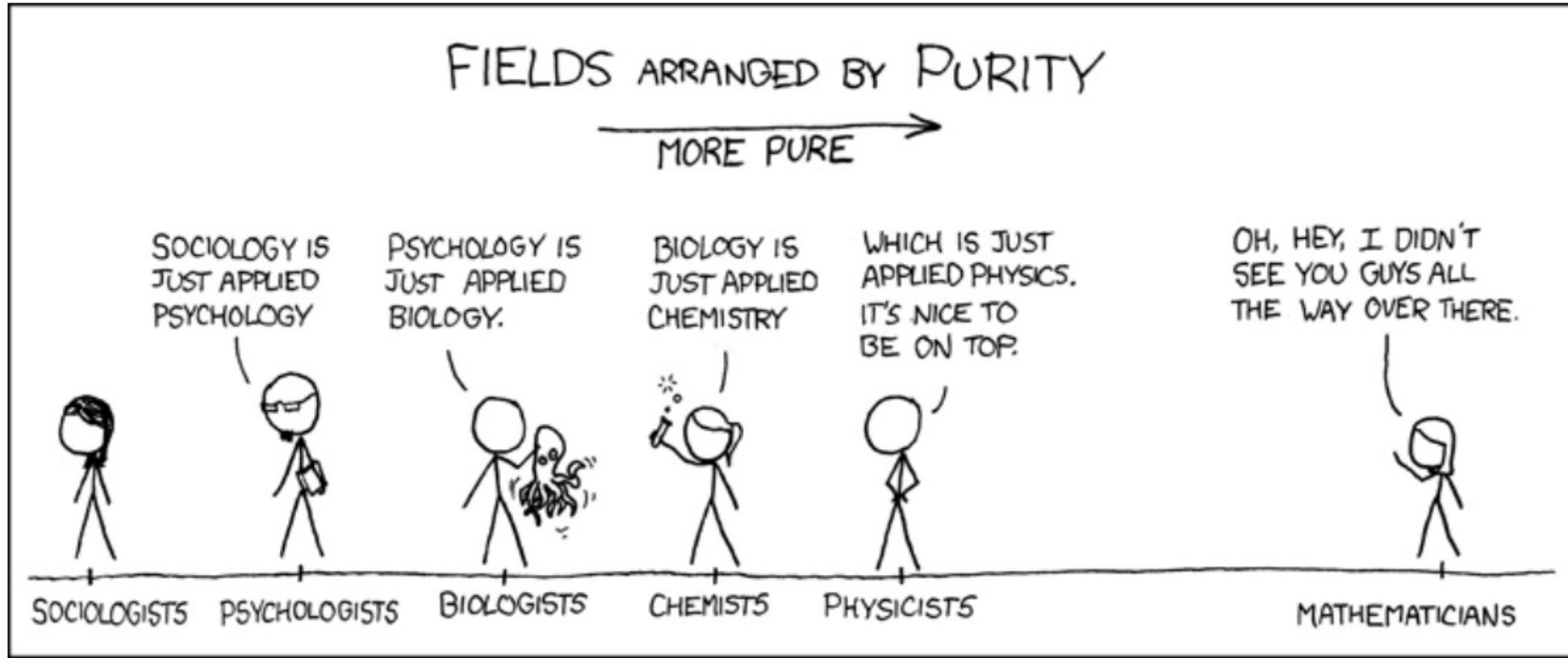
Who has access

- Privacy concerns arise first and foremost because of the questions: who can access my data and for what purposes.
- Is informed consent enough (more in W06, W07)?

Geographic knowledge is not neutral I

There is an uneven spatial politics of geographic knowledge production where theory from the Anglo-American sphere is privileged and universalised.

Geographic knowledge is not neutral II



Geographic knowledge is not neutral III

More general:

- **positionality**: the idea that the identities of the researcher influence the research process and their interactions with research participants (also applies to data!)
- **reflexivity**: the process of considering the researcher's positionality and the effects of this positionality on one's research

Geographic knowledge is not neutral IV

- There is an implicit danger in an attempt to attain objective knowledge, that what appears to one group of researchers at a particular point in time is often treated as a fact (see also the article by Schurr *et al.* 2020).
- When defining social identities, social scientists have often translated prejudices into "objective" categories.

Institutionalisation of prejudice I

From prejudice to "objective prejudice" in extrema:

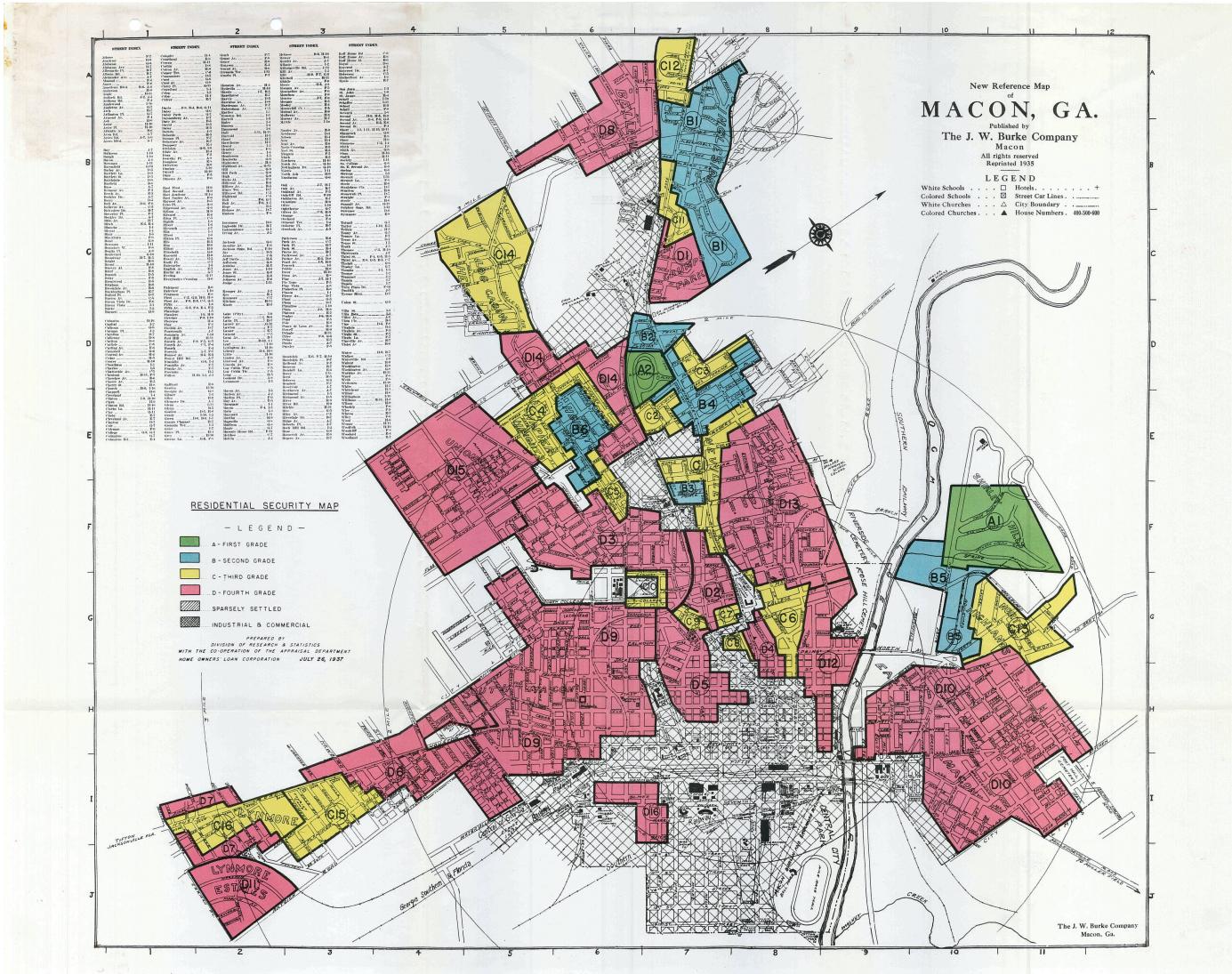
- Eugenics: a 'science' of improving the human species through gene selection, which in effect is the advocacy of selective breeding of the population to further racist or discriminatory aims.
- Scientific racism: much of the knowledge was developed through western perspectives, with some using it as a reason to segregate populations (e.g. 'separated development')

UCL last year made an official apology for the role they played in facilitating eugenic 'research'; renamed several buildings (North-West Wing) and lecture theaters.

Institutionalisation of prejudice II

- Redlining. US 1930s: government surveyors graded neighborhoods in 239 cities, color-coding them green for “best,” blue for “still desirable,” yellow for “definitely declining” and red for “hazardous.”
- The “redlined” areas were the ones local lenders discounted as credit risks, in large part because of the residents’ racial and ethnic demographics.
- Loans in these neighborhoods were unavailable or very expensive, making it more difficult for low-income minorities to buy homes and setting the stage for the country’s persistent racial wealth gap.

Institutionalisation of prejudice III

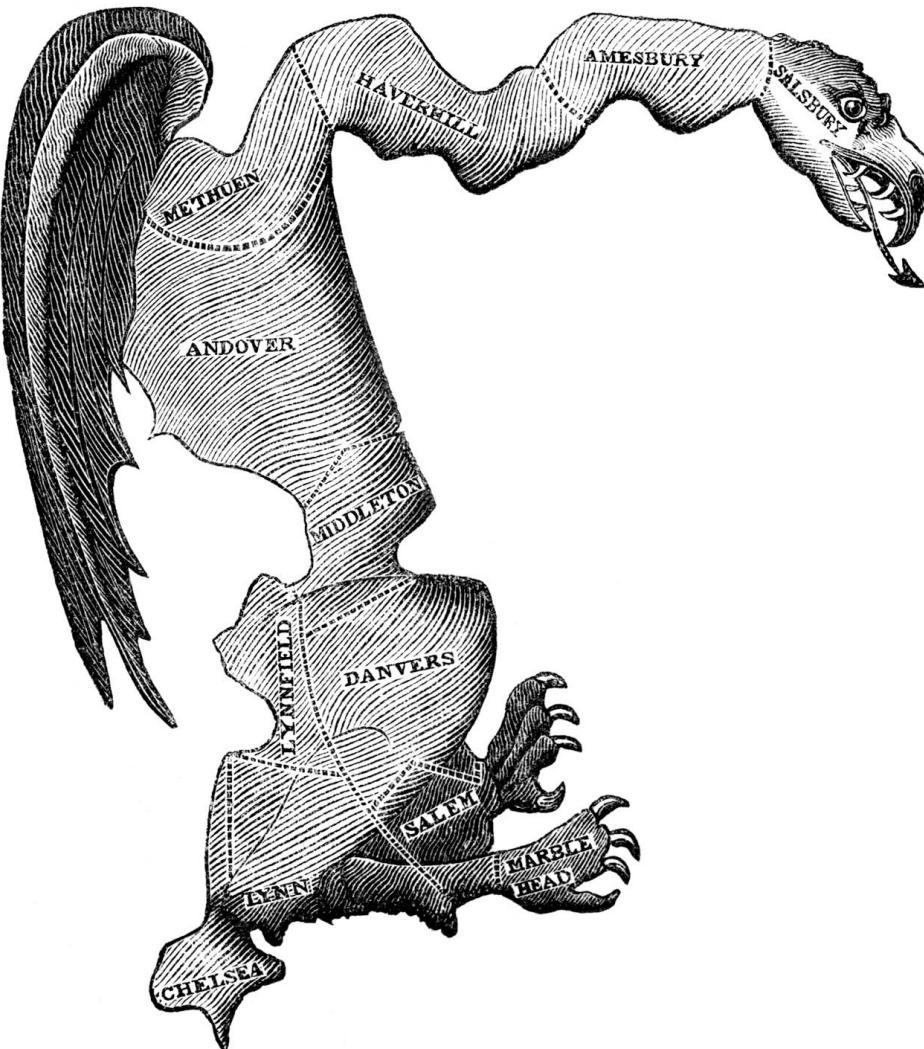


Washington Post. 2018. Redlining was banned 50 years ago. It's still hurting minorities today. [Online] <https://www.washingtonpost.com/news/wonk/wp/2018/03/28/redlining-was-banned-50-years-ago-its-still-hurting-minorities-today/>

Institutionalisation of prejudice IV

- Gerrymandering. The practice of drawing the boundaries of electoral districts in a way that gives one political party **an unfair advantage** over its rivals (political or partisan gerrymandering) or that dilutes the voting power of members of ethnic or linguistic minority groups (racial gerrymandering).
- The term is derived from the name of Gov. Elbridge Gerry of Massachusetts, whose administration enacted a law in 1812 defining new state senatorial districts. The law consolidated the Federalist Party vote in a few districts and thus gave disproportionate representation to Democratic-Republicans. The outline of one of these districts was thought to resemble a salamander: "The Gerry-mander".

Institutionalisation of prejudice V



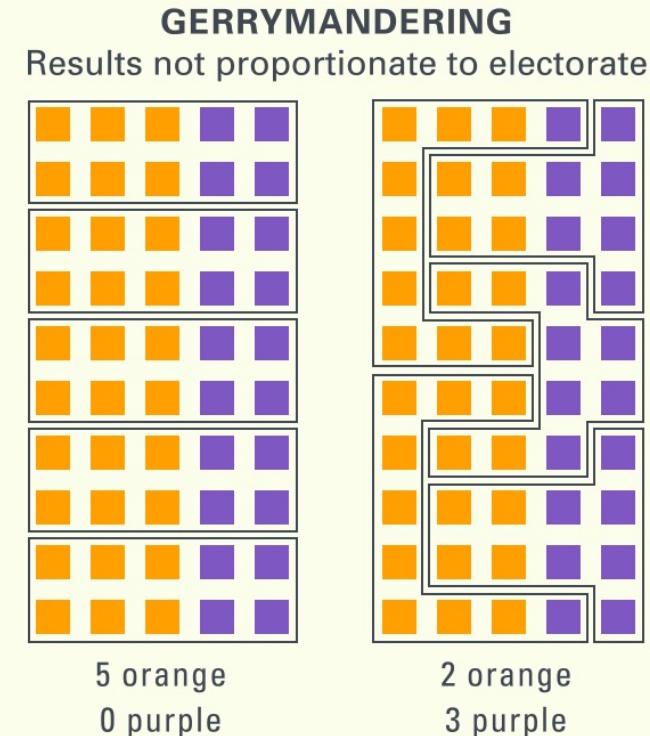
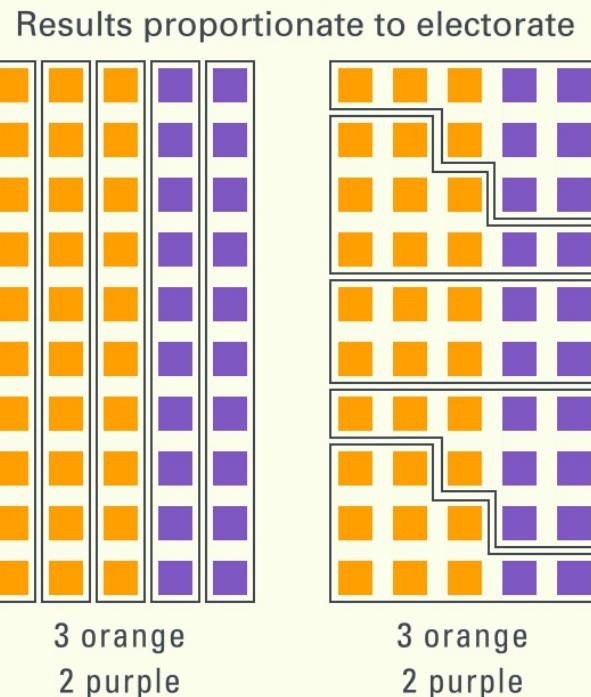
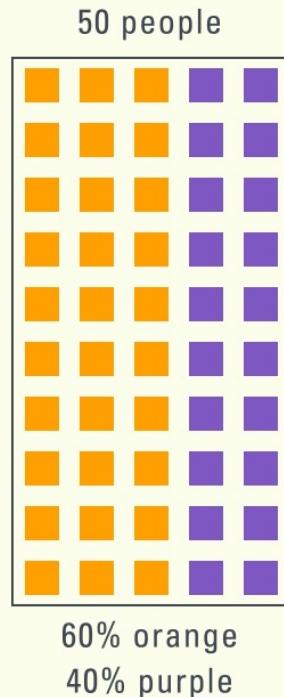
Encyclopaedia Britannica, Inc.. Gerrymandering. [Online]
<https://www.britannica.com/topic/gerrymandering>

Institutionalisation of prejudice VI

GERRYMANDERING

How differently drawn district maps produce different electoral results

FOUR WAYS TO DIVIDE 50 PEOPLE INTO 5 DISTRICTS:



© Encyclopædia Britannica, Inc.

Making the same mistakes of the past?

- Texas: enactment of most restrictive abortion law in the United States.
- Democratic-leaning cities and their suburbs are growing quickly, while Republican-leaning rural areas are not.
- The Guardian 5 September 2021:

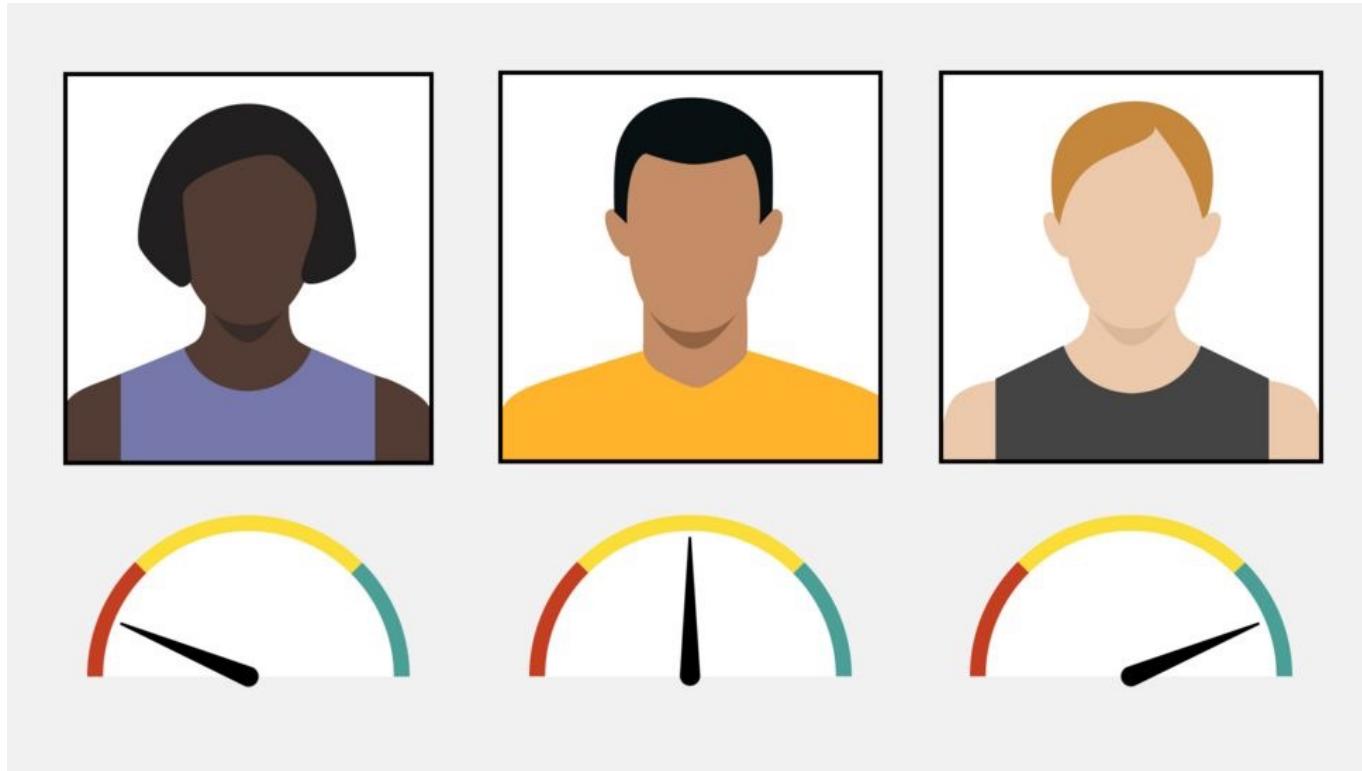
"A decade ago, Republicans had complete control over the process of drawing the boundaries for state legislative and congressional districts. It allowed them to distort the lines to help Republicans win elections and guarantee their election in the state legislature over the past 10 years. This year the lines will be redrawn again and Republicans once again will have complete control of the process."

Making the same mistakes of the past?

- Netherlands: "Leefbaarheidsbarometer" ('neighbourhood liveability')
- Composite measure, comparable to the Index of Multiple Deprivation in the UK
- 100s of variables such as distance to nearest highway, access to greenery, access to education, access to health.
- Percentage of immigrants ("non-Western"): specifically percentage of people with a Turkish, Surinam, Moroccan, or Eastern Europeans background.
- Producers of the indicator would claim they look at prediction power ('correlation' not 'causation') – what about the consumer of these indicators and maps?
- How to measure 'neighbourhood liveability' to begin with – very subjective

Making the same mistakes of the past?

BBC 2020: Women with darker skin are more than twice as likely to be told their photos fail UK passport rules when they submit them online than lighter-skinned men. How?



Machine learning I

- Machine learning and AI sound more exciting than they actually are.
- Unsupervised machine learning is trying to recognise patterns in datasets, e.g. clustering techniques such as k-means.
- Supervised machine learning is all about learning from examples, e.g. tagged images (Google's reCAPTCHA) for image-based classification or a description of certain characteristics.
- Classification confidence goes up the more data is fed into such an algorithm.

Machine learning II



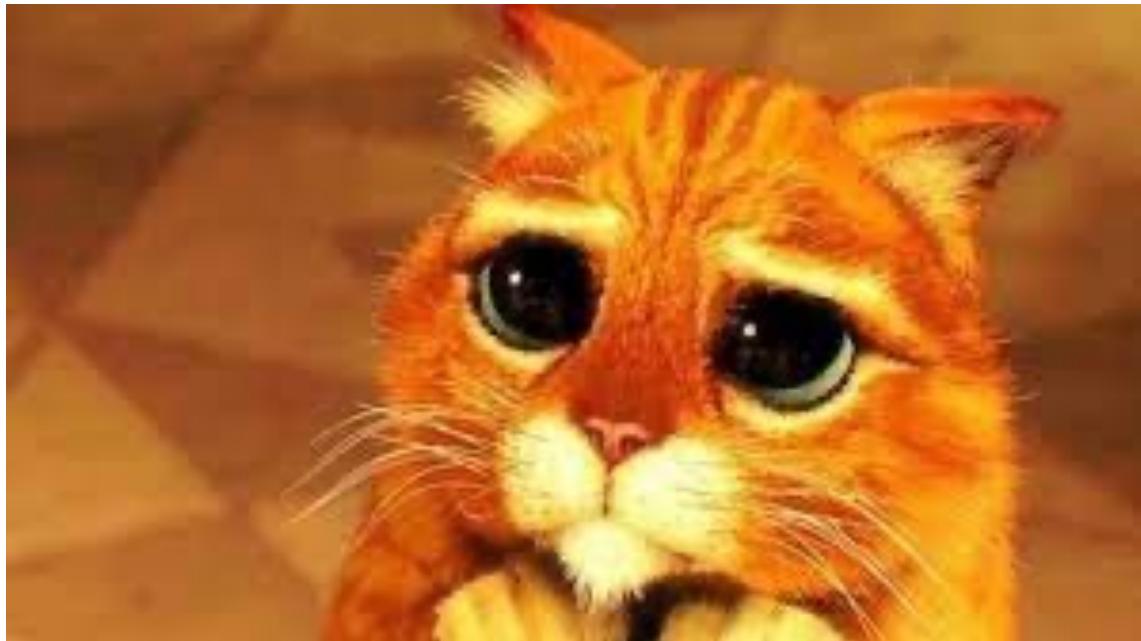
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Machine learning III

So, what will happen?



Machine learning IV

So, what will happen?



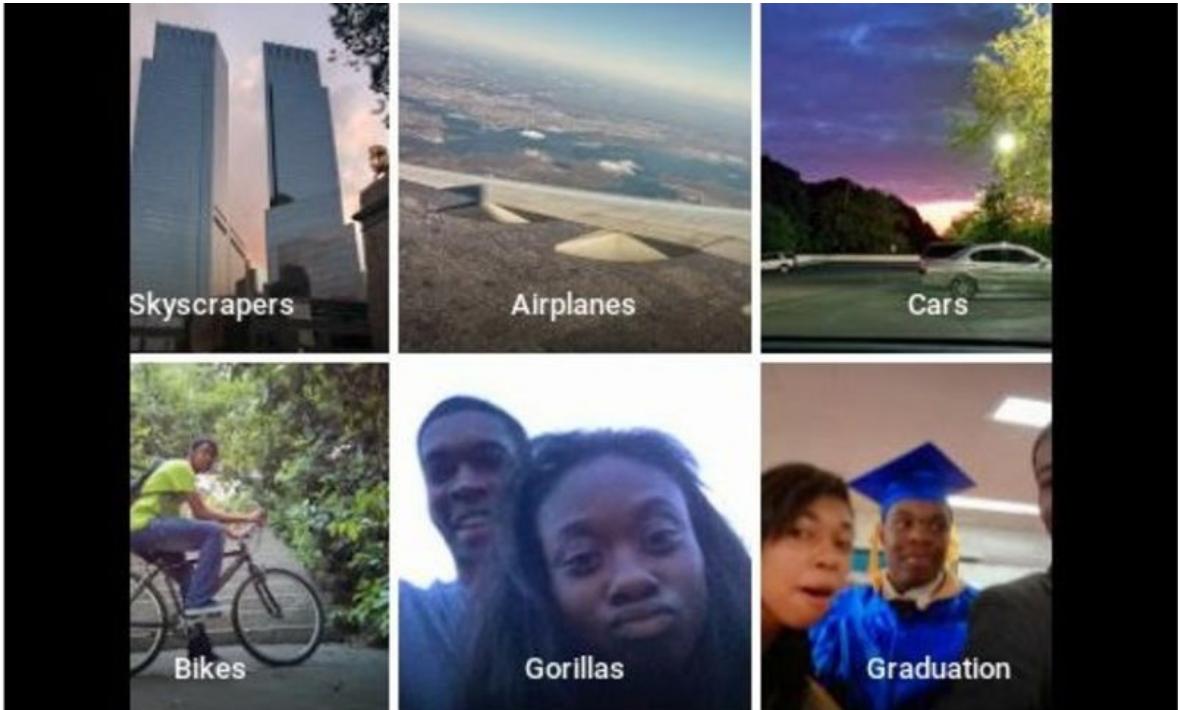
Machine learning V

So, what will happen?



Isolated incidents?

Google Photo's image recognition system in 2015



Isolated incidents?

- Twitter's saliency algorithm , trained on eye-tracking data, used to crop images
- It was found that the algorithm showed:
 - An 8% difference in favour of women over men
 - A 4% difference favouring white people over black people of both sexes
 - A 7% difference favouring white women over black women
 - A 2% difference in favour of white men over black men

Isolated incidents?

- Software used in self-driving cars.
- 2019 research by Georgia Institute of Technology tested several models used by academic researchers, trained on publicly available datasets.
- Results: if you're a person with dark skin, you may be more likely than your white friends to get hit by a self-driving car because automated vehicles may be better at detecting pedestrians with lighter skin tones.
- *Note that the research did not use actual data from autonomous car manufacturers as they refuse to make these available.*

Isolated incidents?

Examples are far from limited to data science and novel automated procedures in the domain of machine learning and artificial intelligence.

Isolated incidents?

Medical textbook for nurses with a section on “cultural differences in response to pain”.

Some actual quotes:

“Pain is considered a test of faith. Muslim clients must endure pain as a sign of faith in return for forgiveness and mercy.”

“Black people often report higher pain intensity than other cultures because they believe pain must be shared and validated by others.”

Isolated incidents?

London Metropolitan Police's Gang Database:



80%
12-24 year old



78%
Black people



75%
have been victims of
violence themselves



35%
never committed any
serious offences

Conclusion I

- We explored some of the 'ugly' side of (large) human-generated datasets and datafication.
- Neutrality within data science, nor the wider social science, does not exist. This is not new, however, existing biases are perpetuated and exacerbated – and in some cases institutionalised (e.g. Met's Gang matrix).
- Data are created and analysed within socio-political assemblages that inscribe it with particular biases and representations. Gets worse with black-box algorithms. **Ugly!**
- Thomas theorem: "When people define situations as real, they become real in their consequences."

Conclusion II

Piketty 2017, p.3:

"Social scientific research is and always will be tentative and imperfect. It does not claim to transform economics, sociology, and history into exact sciences. But by patiently searching for facts and patterns and calmly analyzing the economic, social, and political mechanisms that might explain them, it can inform democratic debate and focus on the right questions."

... we probably should keep both Thomas and Piketty in mind.

Seminar preparation

In preparation for the next seminar, carefully read the following article by Denton *et al.* 2021 and think about the linkages between this article and the other readings on this week's list:

Denton, E., Hanna, A., Amironesei, R. *et al.* 2021. On the genealogy of machine learning datasets: A critical history of ImageNet. *Big Data & Society*.

You do not have to submit anything, however, do come prepared as this article will be guiding our discussion.

Questions

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