Data, Politics and Society

W3 – Data III: The Ugly

UCL

Where we at?

W1
W2
W3

Data: The Good, The Bad, The Ugly

W4
W5

Societal and environmental impacts of data and technology

The Ugly

Today

We will be talking about the ugly side of large human-generated datasets and the datafication of daily life, around three themes:

- Privacy
- Consent
- Neutrality

Privacy

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 was 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

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

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."

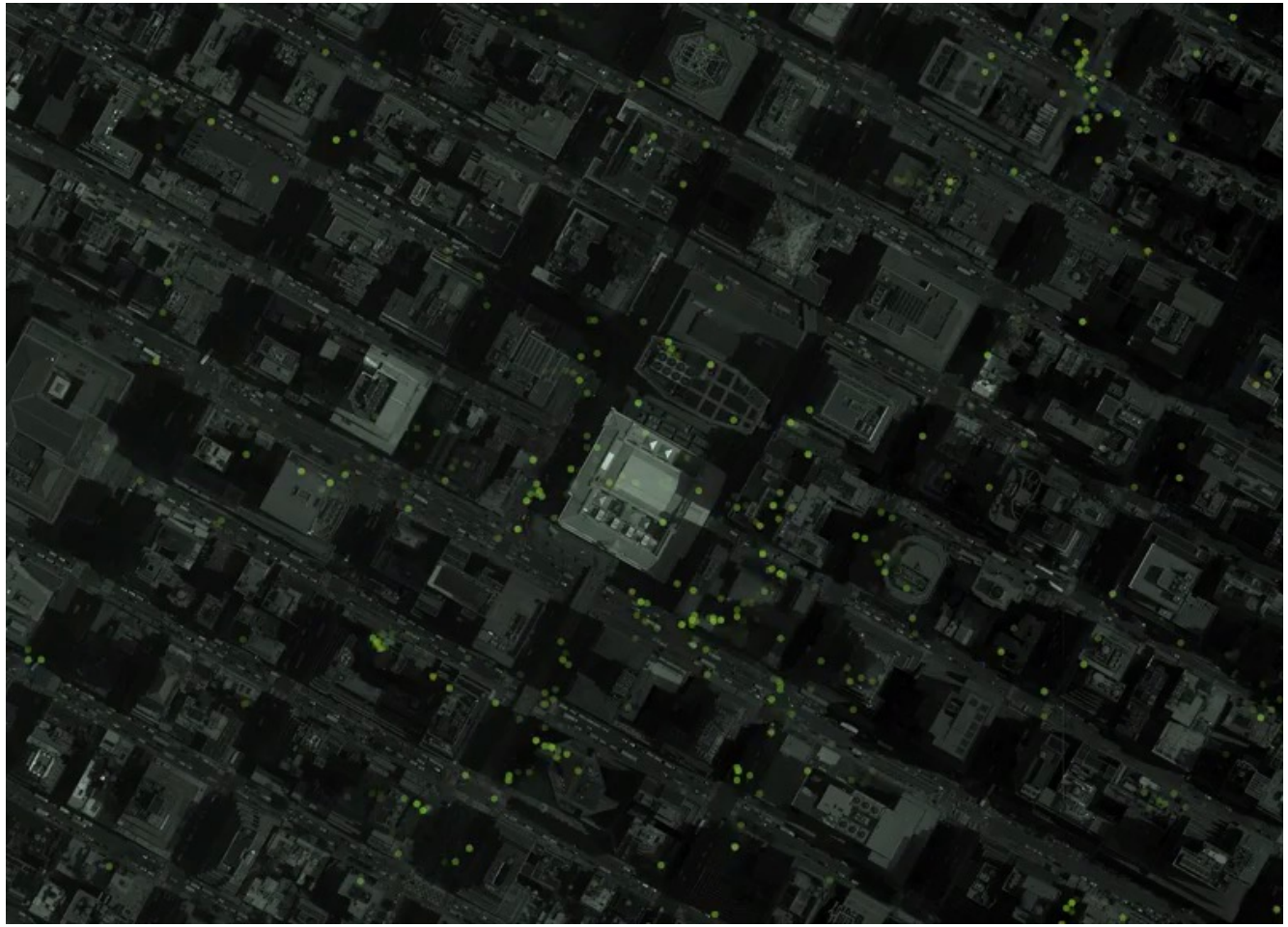
Locational privacy

- 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

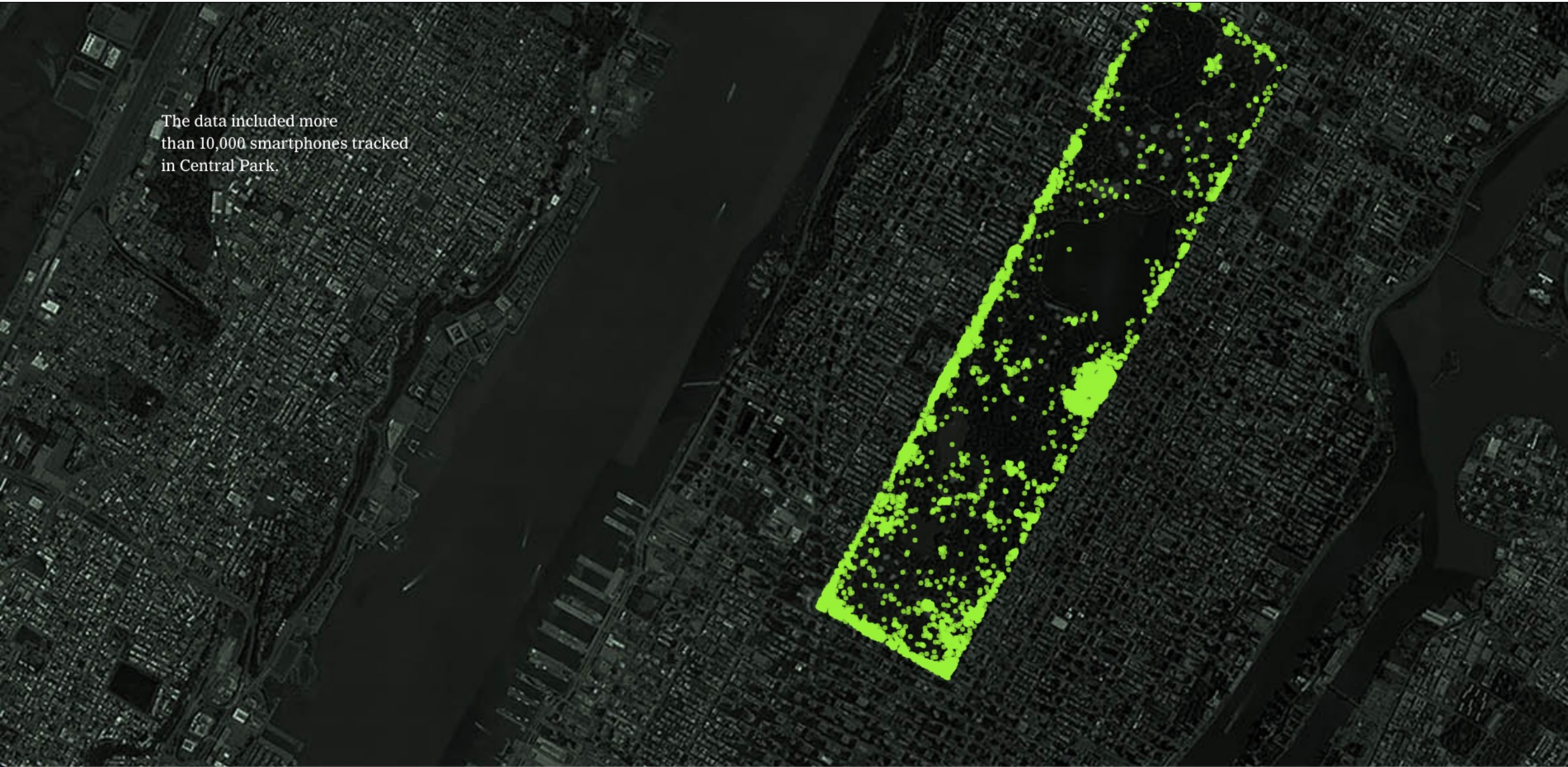
- The Privacy Project by the New York Times (2019).
- NY Times obtained a dataset comprising of more than 50 billion location pings of more than 12 million Americans as they moved through several major cities (e.g. Washington, New York, Los Angeles).
- Each piece of information in this file represents 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



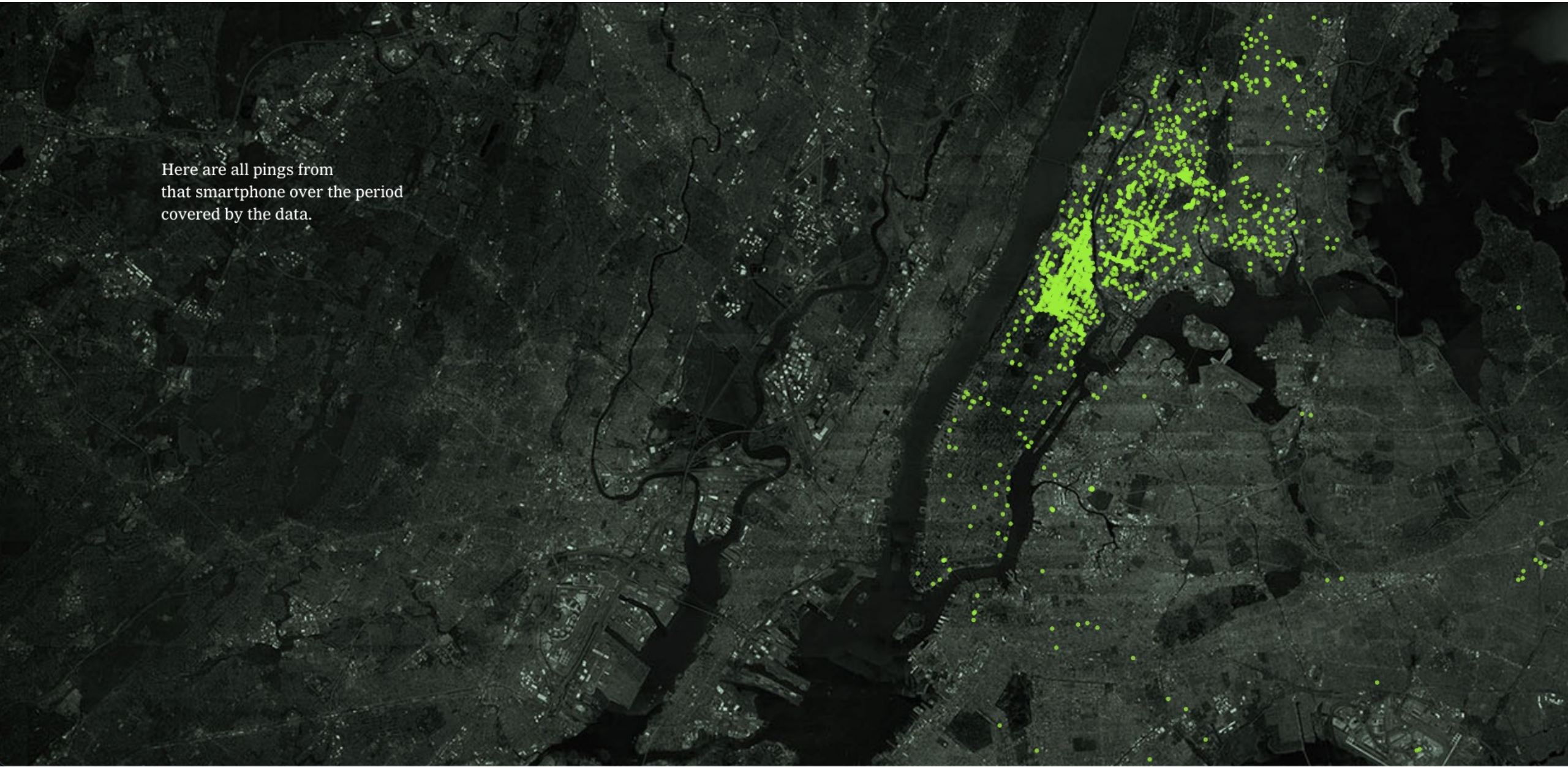
New York Times. 2019. The Privacy Project: Twelve Million Phones, One Dataset, Zero Privacy. [Online] https://www.nytimes.com/interactive/2019/12/19/opinion/location-tracking-cell-phone.html

The Privacy Project



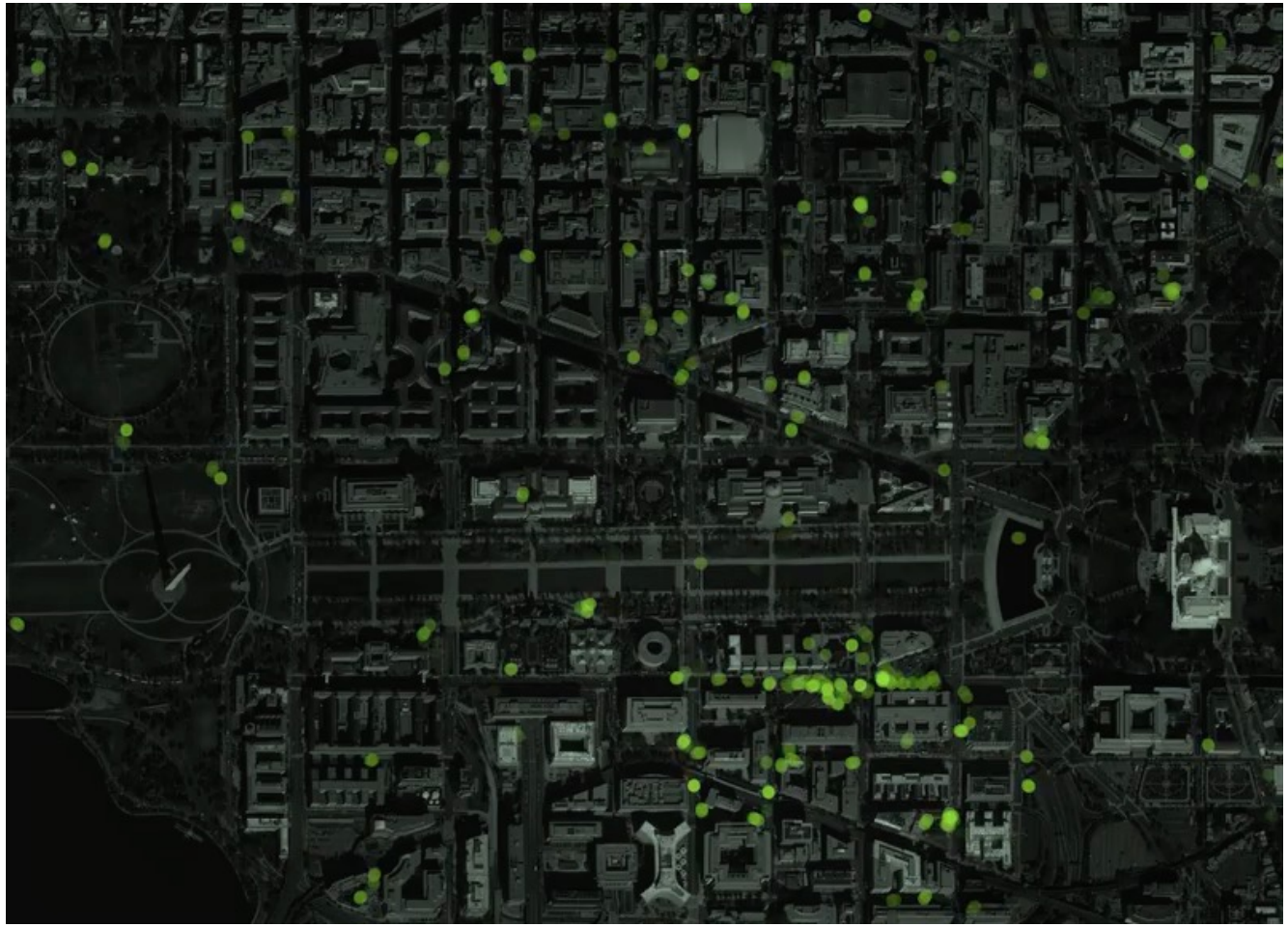
The Privacy Project

The Privacy Project



The Privacy Project

Locational privacy



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

Consent

Unwilling and unknowing participants

- Not just individual spatial data from location-based services can be very informative: social media data is another source used to generate population insights.
- 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”.
- Dalton and Thatcher 2015: production of consumer geographies.
- New ‘Big’ Data: from quantified space to quantified individuals.

Unwilling and unknowing participants

- 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.
- participation is voluntary
- benefits and risks of participating
- procedures for withdrawal from the study
- usage of the data during research

Who has access

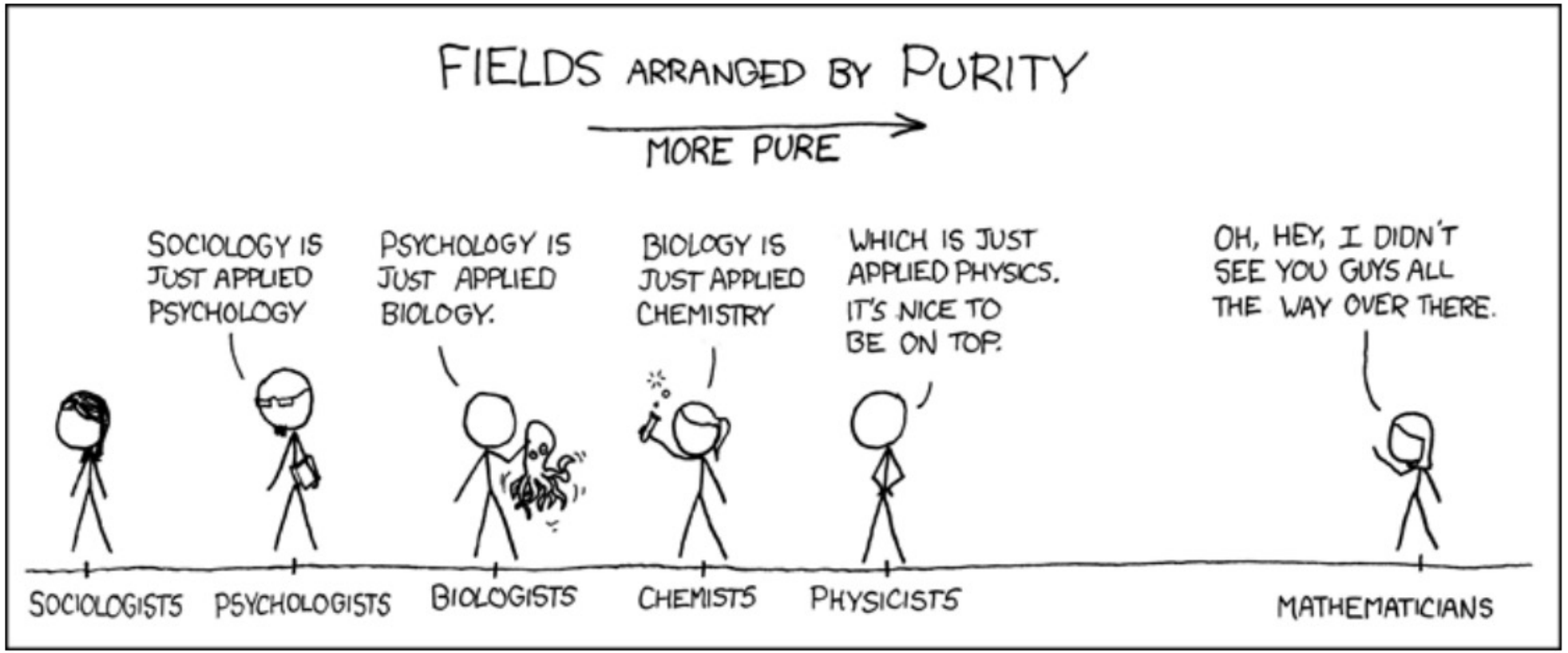
- Privacy concerns arise first and foremost because of the questions: who can access my data and for what purposes.
- Is informed consent enough (more in W06, W07)?

Neutrality

Knowledge is not neutral

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

Knowledge is not neutral



Knowledge is not neutral

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

Knowledge is not neutral

- 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

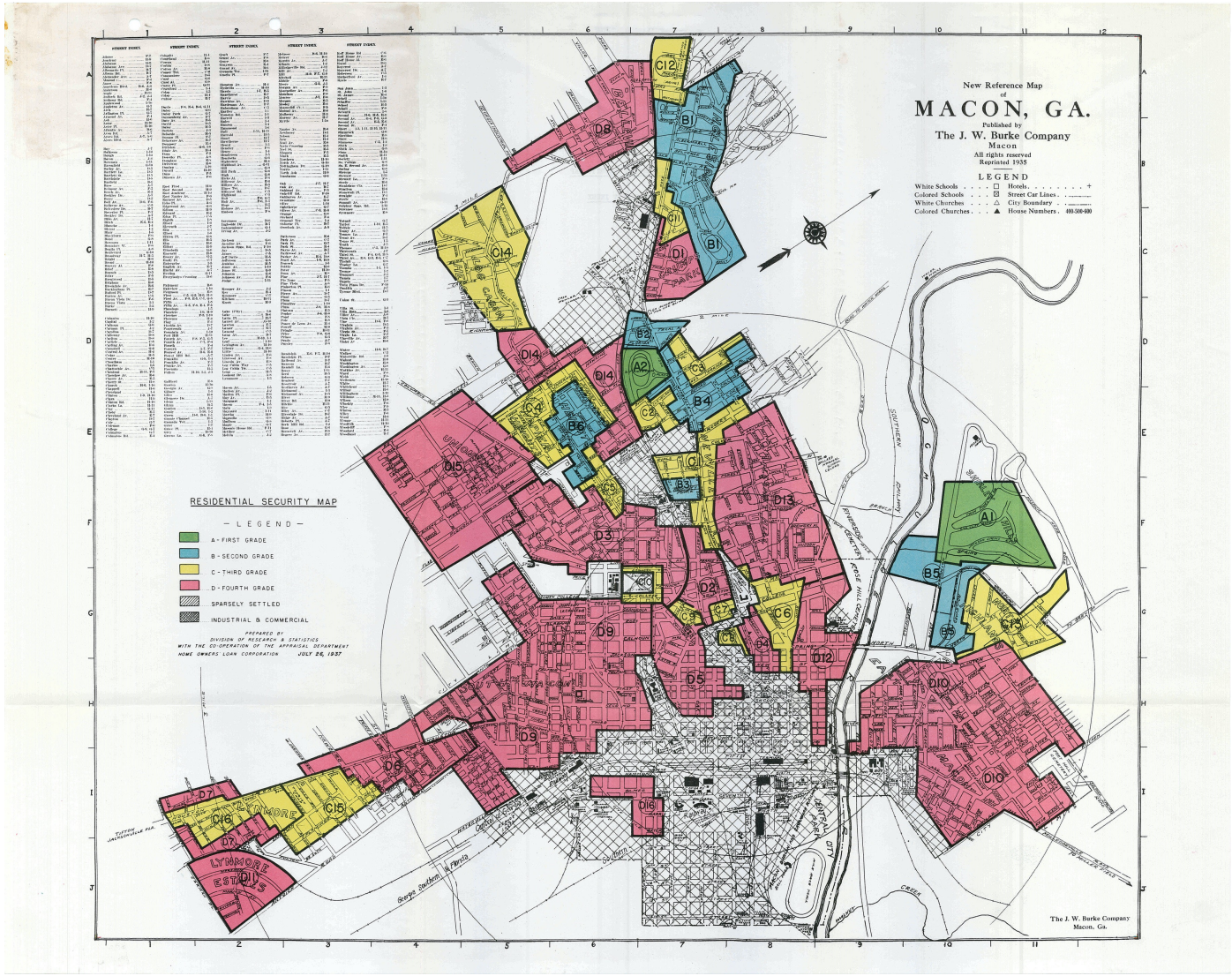
From prejudice to ”objective prejudice” in extrema:

- 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’ in Apartheid South Africa)

Institutionalisation of prejudice

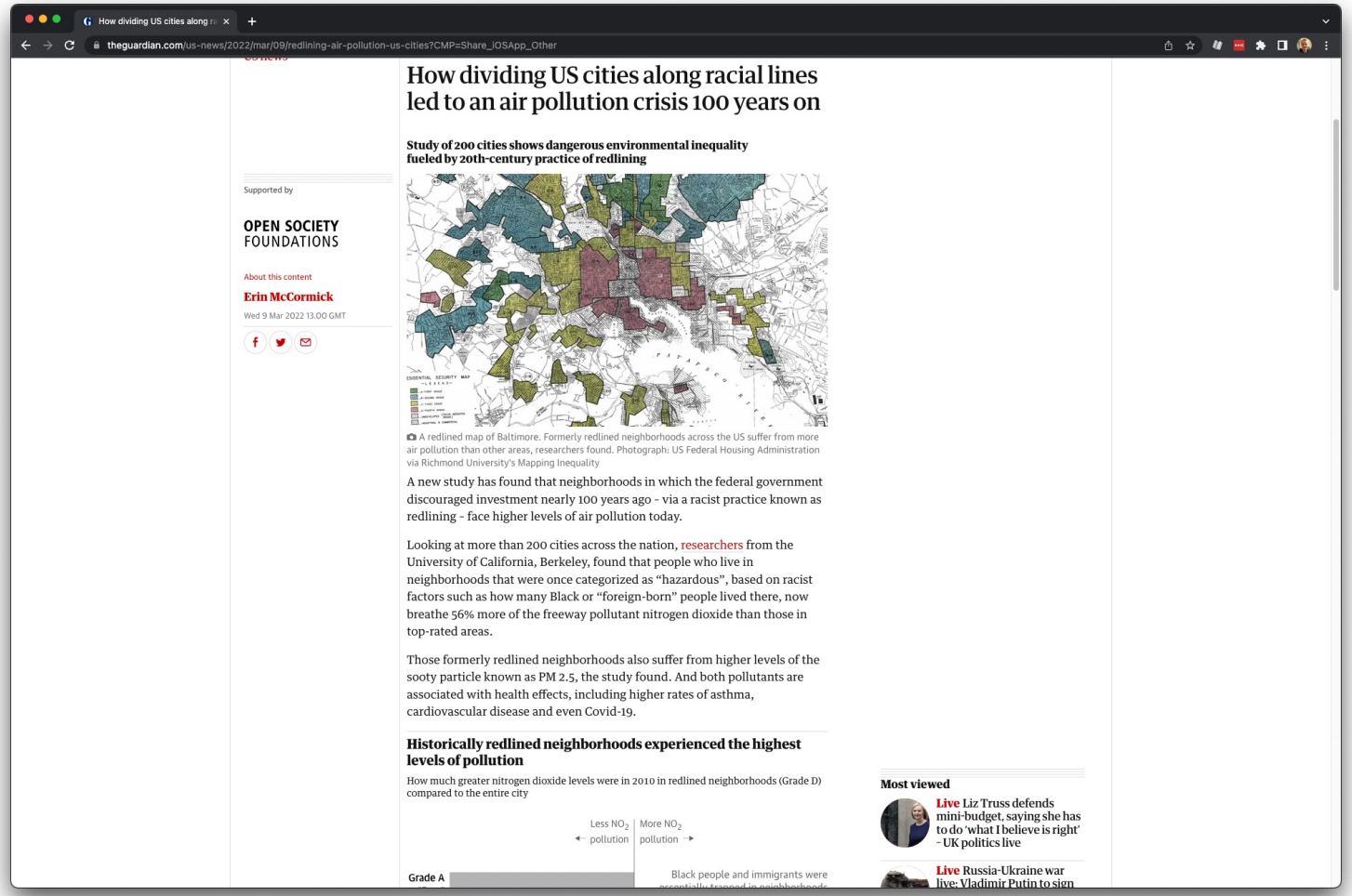
- Redlining. US 1930s: government surveyors graded neighborhoods in 239 cities, color-coding them green for “best,” blue for “still desirable,” yellow for “definitely declining” and red for “hazardous.”
- The “redlined” areas were the ones local lenders discounted as credit risks, in large part because 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



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/

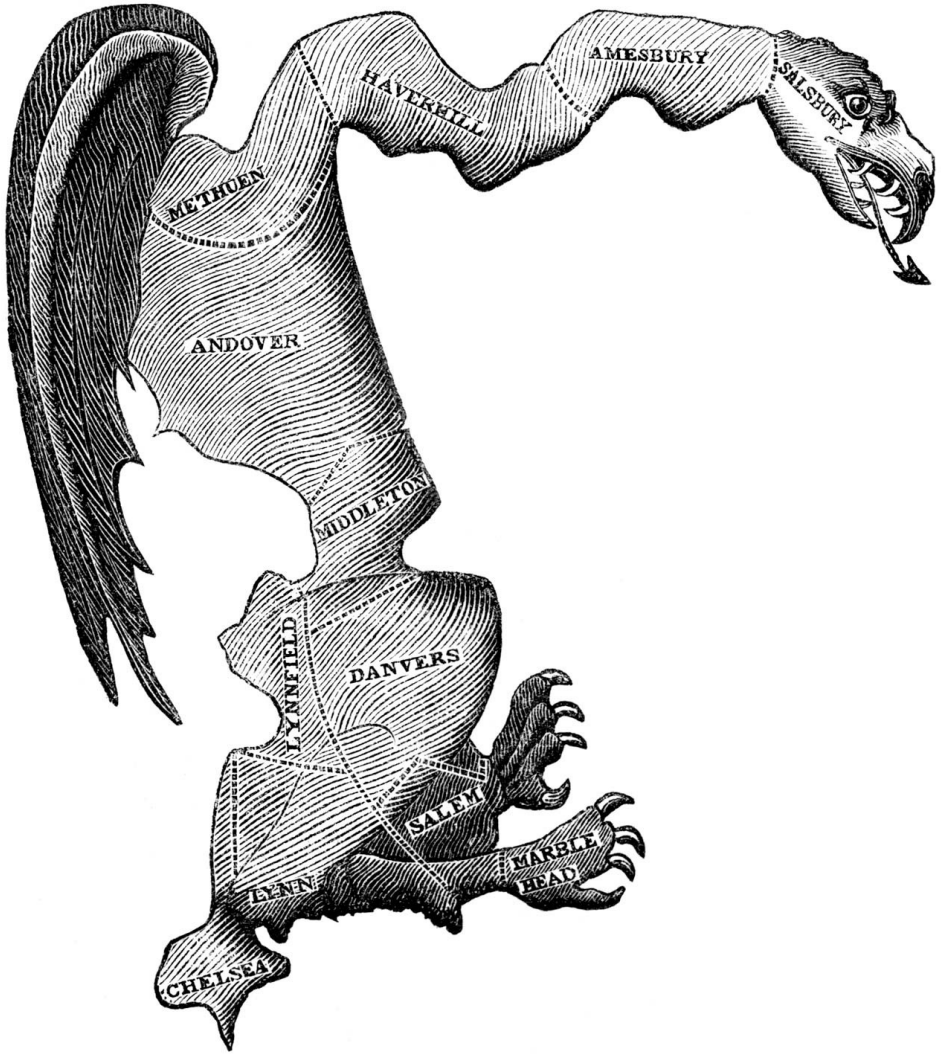
Institutionalisation of prejudice



Institutionalisation of prejudice

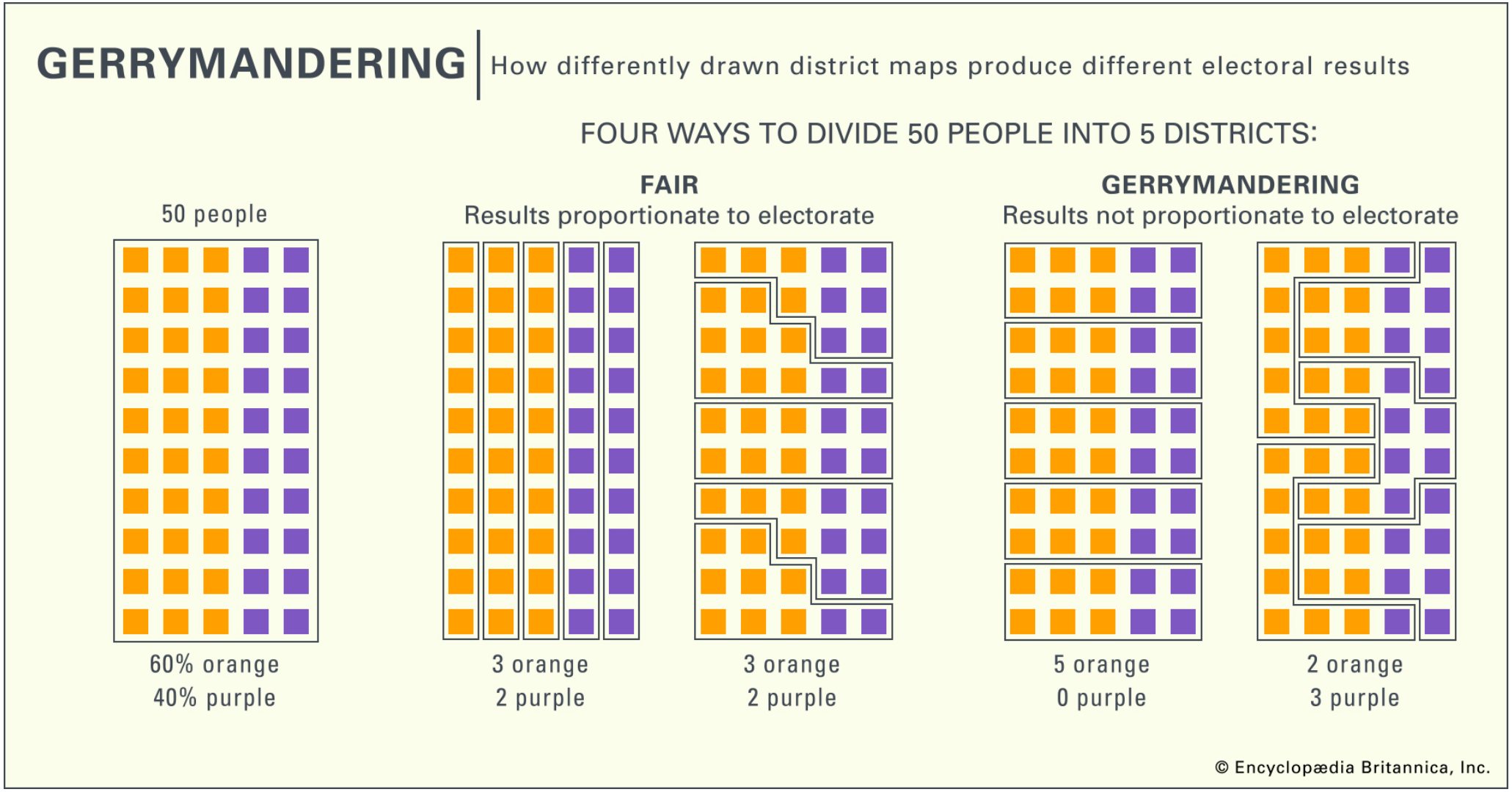
- Gerrymandering. The practice of drawing the boundaries of electoral districts in a way that gives one political party an unfair advantage over its rivals (political or partisan gerrymandering) or that dilutes the voting power of members of ethnic or linguistic minority groups (racial gerrymandering).
- 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



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

Institutionalisation of prejudice



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

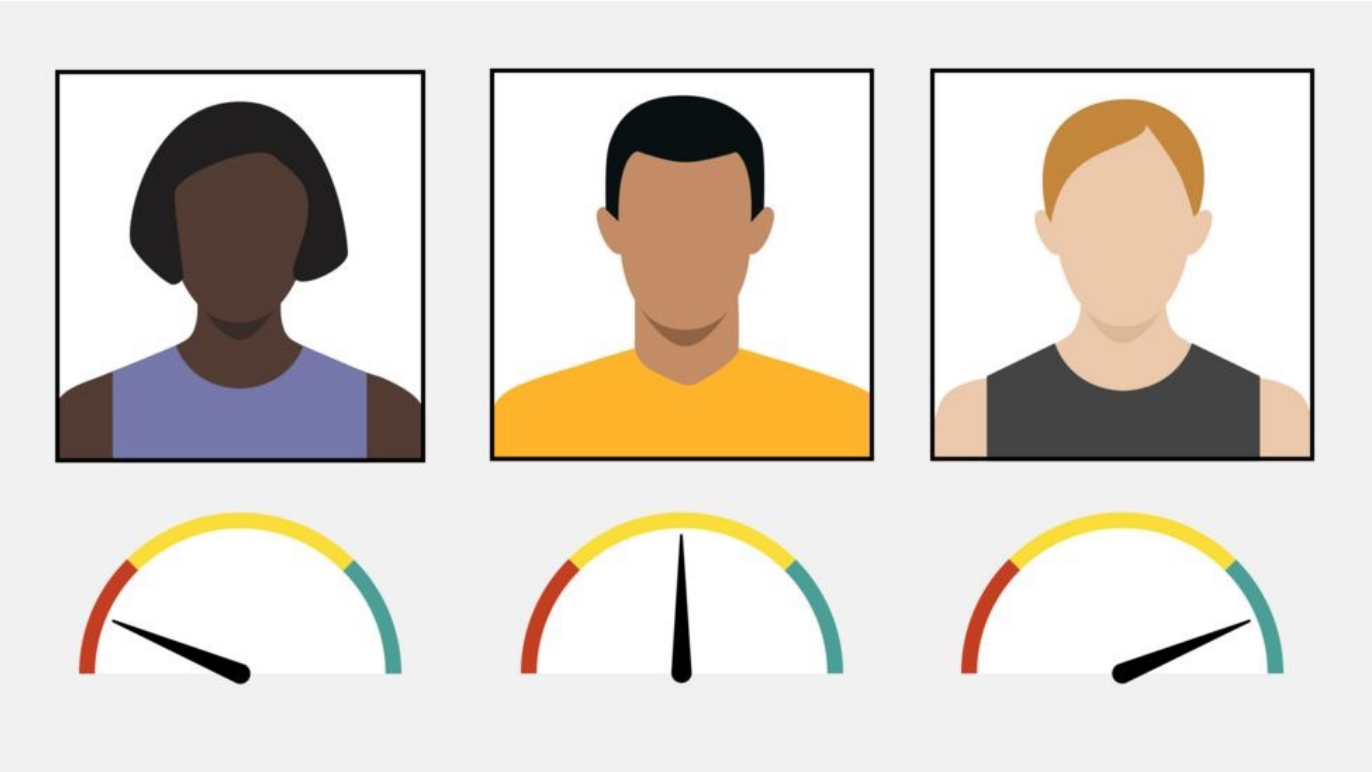
Making the same mistakes of the past?

- Texas: enaction 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?

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?



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 predictionary power (‘correlation’ not ‘causation’) – what about the consumer of these indicators and maps?
- How to measure ‘neighbourhood liveability’ to begin with – very subjective

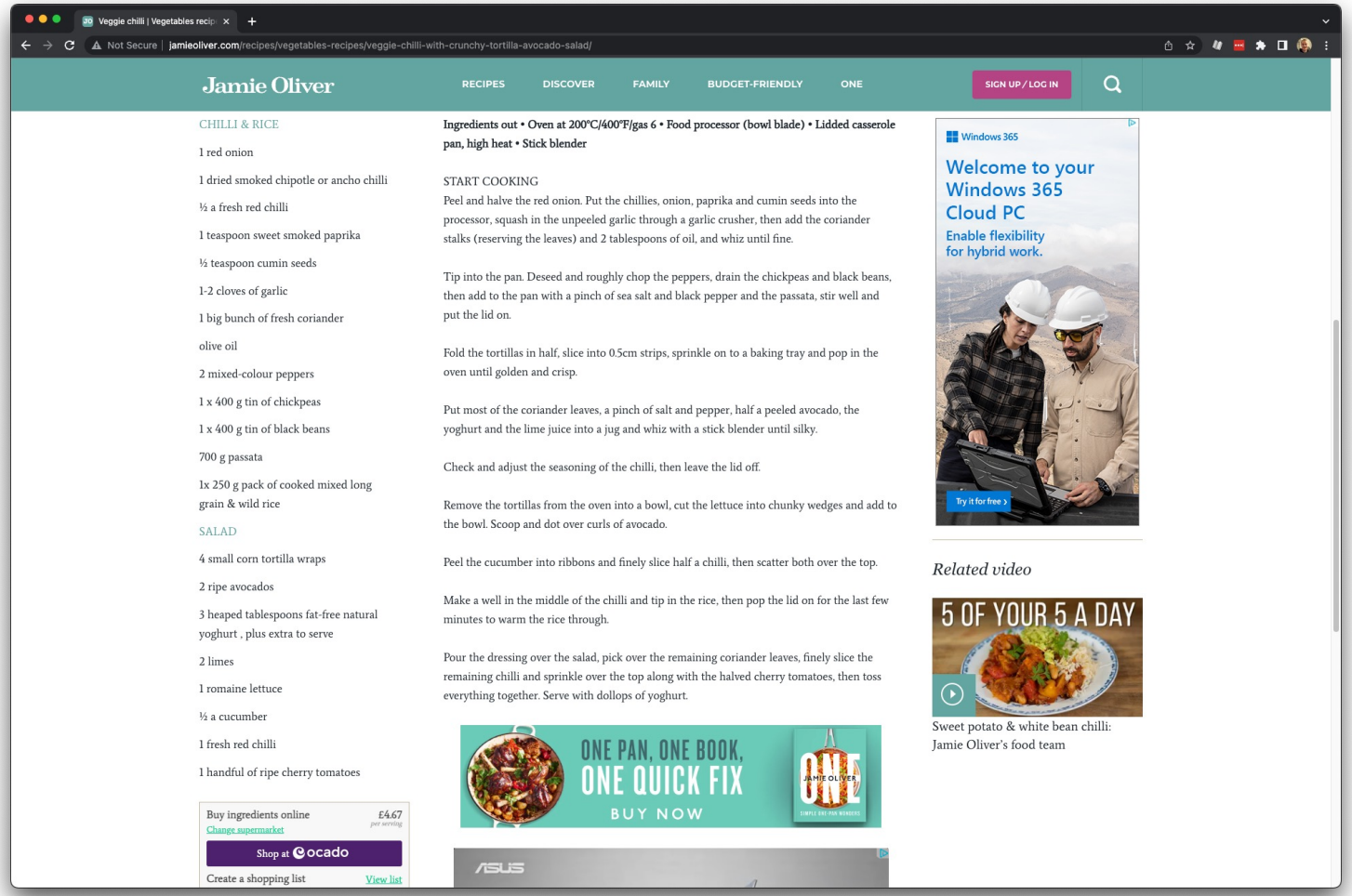
Making the same mistakes of the past?

Algorithms applied on large, unrepresentative datasets may exacerbate bias and prejudice, especially when they are used for decision-making (”e.g. algorithmic governance”).

Algorithm

What is an algorithm?

Algorithm


Veggie chilli | Vegetables recip
Not Secure | jamieoliver.com/recipes/vegetables-recipes/veggie-chilli-with-crunchy-tortilla-avocado-salad/
Jamie Oliver
RECIPES
DISCOVER
FAMILY
BUDGET-FRIENDLY
ONE
SIGN UP / LOG IN
CHILLI & RICE
1 red onion
1 dried smoked chipotle or ancho chilli
½ a fresh red chilli
1 teaspoon sweet smoked paprika
½ teaspoon cumin seeds
1-2 cloves of garlic
1 big bunch of fresh coriander
olive oil
2 mixed-colour peppers
1 x 400 g tin of chickpeas
1 x 400 g tin of black beans
700 g passata
1x 250 g pack of cooked mixed long grain & wild rice
SALAD
4 small corn tortilla wraps
2 ripe avocados
3 heaped tablespoons fat-free natural yoghurt , plus extra to serve
2 limes
1 romaine lettuce
½ a cucumber
1 fresh red chilli
1 handful of ripe cherry tomatoes
Buy ingredients online
£4.67
per serving
Change supermarket
Shop at ocado
Create a shopping list
View list
Ingredients out • Oven at 200°C/400°F/gas 6 • Food processor (bowl blade) • Lidded casserole pan, high heat • Stick blender
START COOKING
Peel and halve the red onion. Put the chillies, onion, paprika and cumin seeds into the processor, squash in the unpeeled garlic through a garlic crusher, then add the coriander stalks (reserving the leaves) and 2 tablespoons of oil, and whiz until fine.
Tip into the pan. Deseed and roughly chop the peppers, drain the chickpeas and black beans, then add to the pan with a pinch of sea salt and black pepper and the passata, stir well and put the lid on.
Fold the tortillas in half, slice into 0.5cm strips, sprinkle on to a baking tray and pop in the oven until golden and crisp.
Put most of the coriander leaves, a pinch of salt and pepper, half a peeled avocado, the yoghurt and the lime juice into a jug and whiz with a stick blender until silky.
Check and adjust the seasoning of the chilli, then leave the lid off.
Remove the tortillas from the oven into a bowl, cut the lettuce into chunky wedges and add to the bowl. Scoop and dot over curls of avocado.
Peel the cucumber into ribbons and finely slice half a chilli, then scatter both over the top.
Make a well in the middle of the chilli and tip in the rice, then pop the lid on for the last few minutes to warm the rice through.
Pour the dressing over the salad, pick over the remaining coriander leaves, finely slice the remaining chilli and sprinkle over the top along with the halved cherry tomatoes, then toss everything together. Serve with dollops of yoghurt.
ONE PAN, ONE BOOK, ONE QUICK FIX
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Welcome to your Windows 365 Cloud PC
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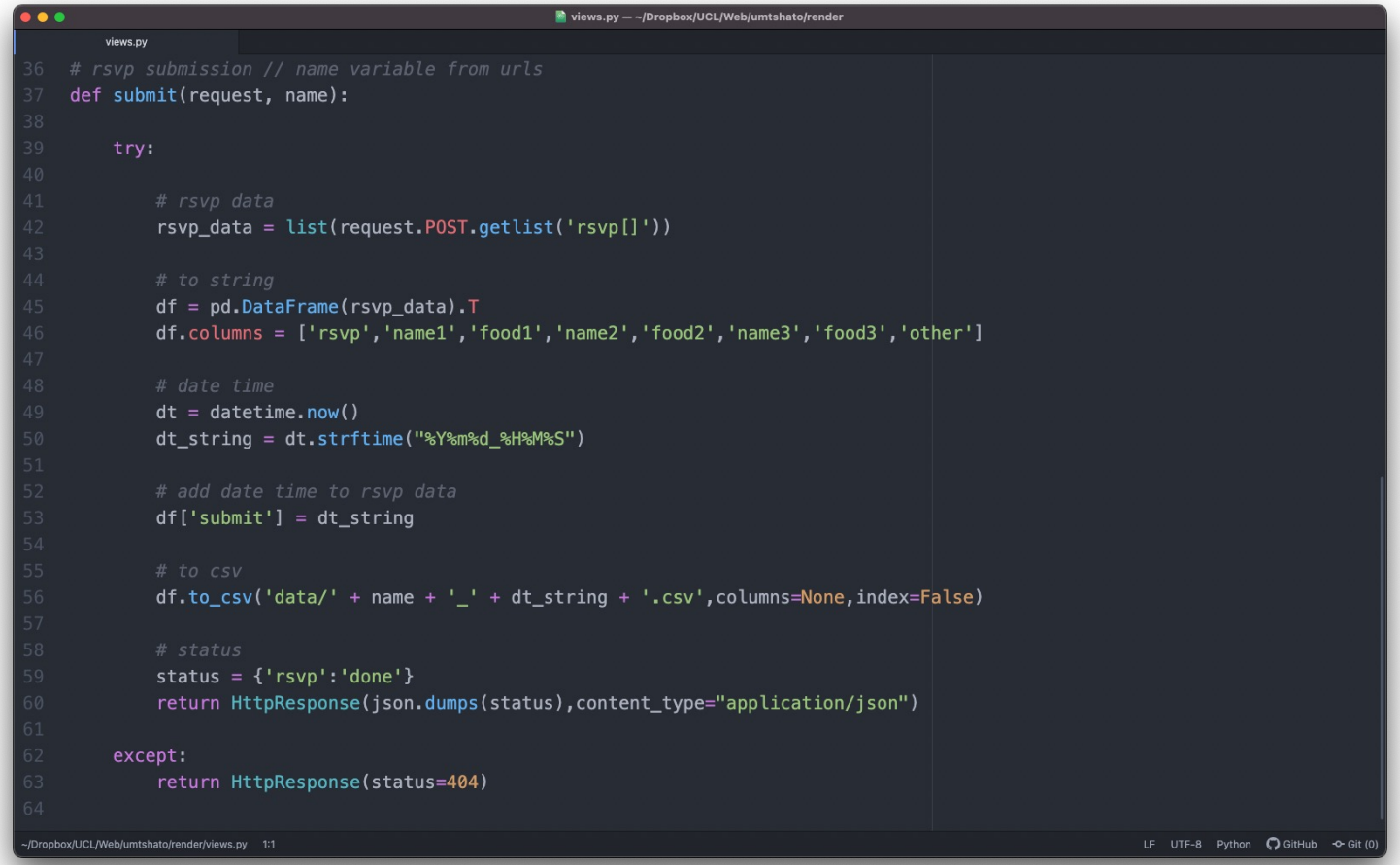
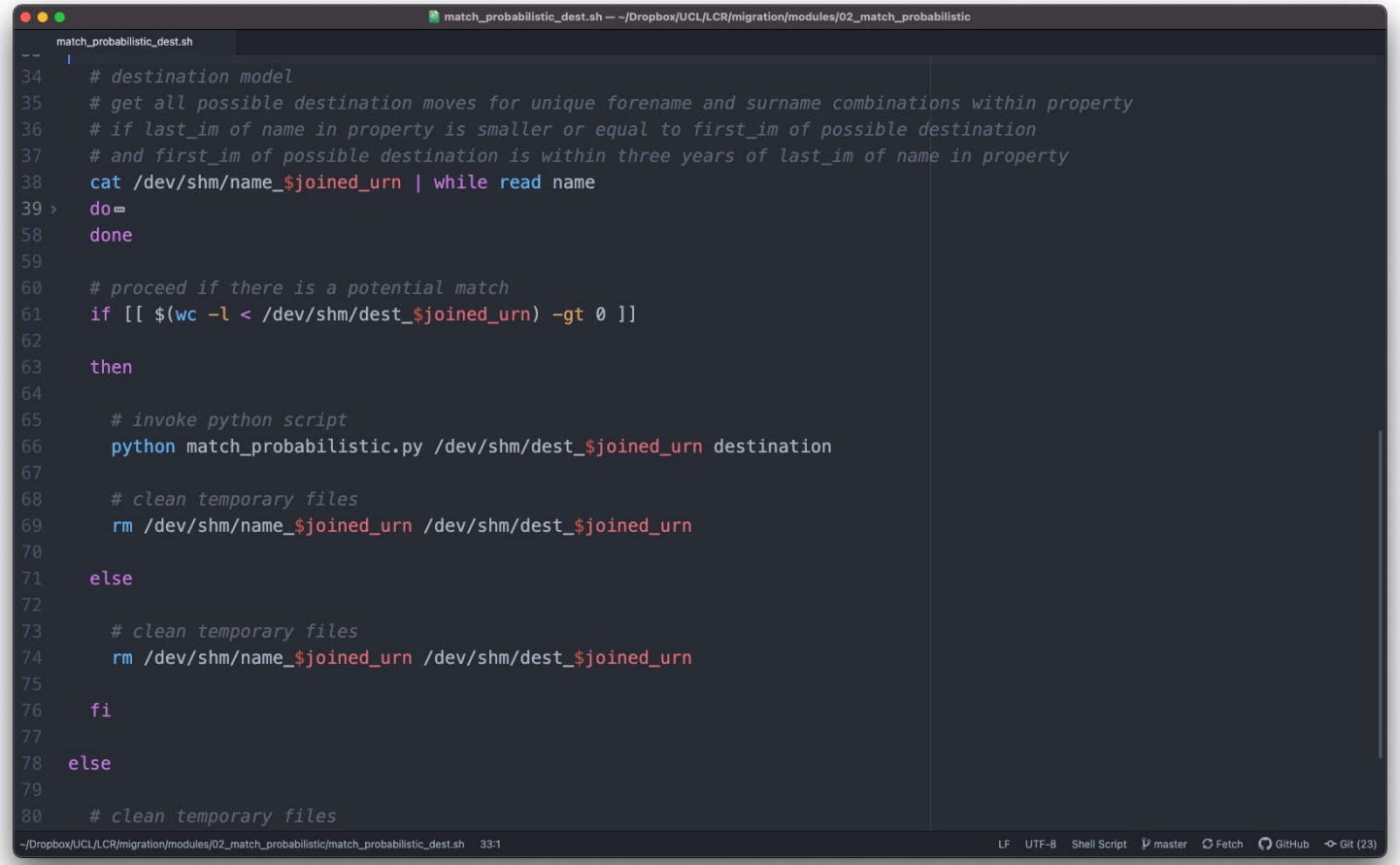
Sweet potato & white bean chilli: Jamie Oliver's food team

Algorithm


views.py — ~/Dropbox/UCL/Web/umtshato/render
views.py
# rsvp submission // name variable from urls
def submit(request, name):
try:
# rsvp data
rsvp_data = list(request.POST.getlist('rsvp[]'))
# to string
df = pd.DataFrame(rsvp_data).T
df.columns = ['rsvp','name1','food1','name2','food2','name3','food3','other']
# date time
dt = datetime.now()
dt_string = dt.strftime("%Y%m%d_%H%M%S")
# add date time to rsvp data
df['submit'] = dt_string
# to csv
df.to_csv('data/' + name + '_' + dt_string + '.csv',columns=None,index=False)
# status
status = {'rsvp':'done'}
return HttpResponse(json.dumps(status),content_type="application/json")
except:
return HttpResponse(status=404)
~/Dropbox/UCL/Web/umtshato/render/views.py 1:1
LF UTF-8 Python GitHub Git (0)

Algorithm


match_probabilistic_dest.sh — ~/Dropbox/UCL/LCR/migration/modules/02_match_probabilistic
match_probabilistic_dest.sh
destination model
get all possible destination moves for unique forename and surname combinations within property
if last_im of name in property is smaller or equal to first_im of possible destination
and first_im of possible destination is within three years of last_im of name in property
cat /dev/shm/name_$joined_urn | while read name
do
done
proceed if there is a potential match
if [[$(wc -l < /dev/shm/dest_$joined_urn) -gt 0]]
then
invoke python script
python match_probabilistic.py /dev/shm/dest_$joined_urn destination
clean temporary files
rm /dev/shm/name_$joined_urn /dev/shm/dest_$joined_urn
else
# clean temporary files
rm /dev/shm/name_$joined_urn /dev/shm/dest_$joined_urn
fi
else
# clean temporary files
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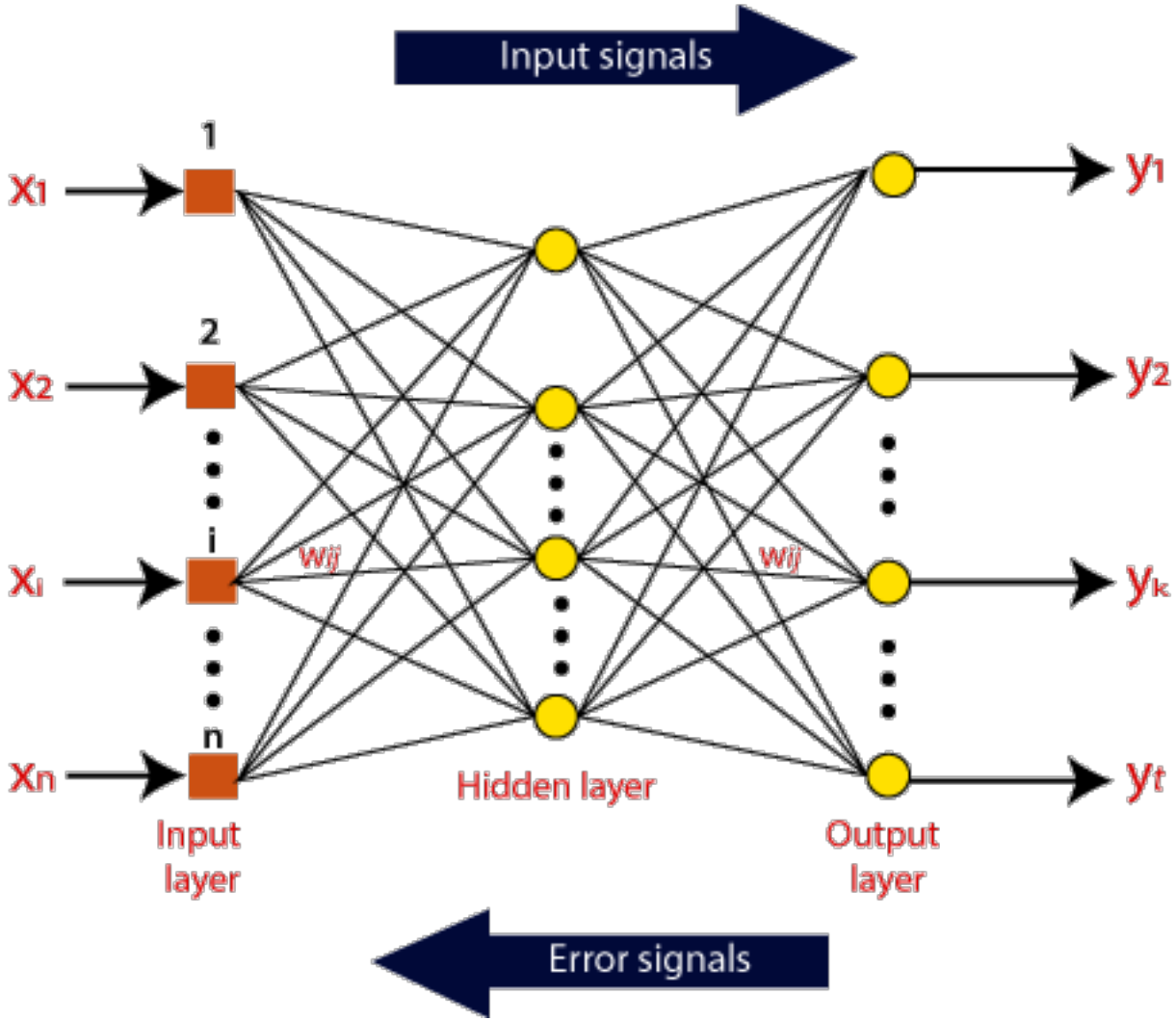
Algorithm


Input signals
1
2
i
n
x1
x2
xi
xn
wij
wij
y1
y2
yk
yt
Input layer
Hidden layer
Output layer
Error signals

Algorithmic bias

- Machine learning and AI sound more exciting than they actually are: data-driven algorithms.
- 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.

Algorithmic bias

= CAT

= DOG

Algorithmic bias

So, what will happen?

Algorithmic bias

So, what will happen?

Algorithmic bias

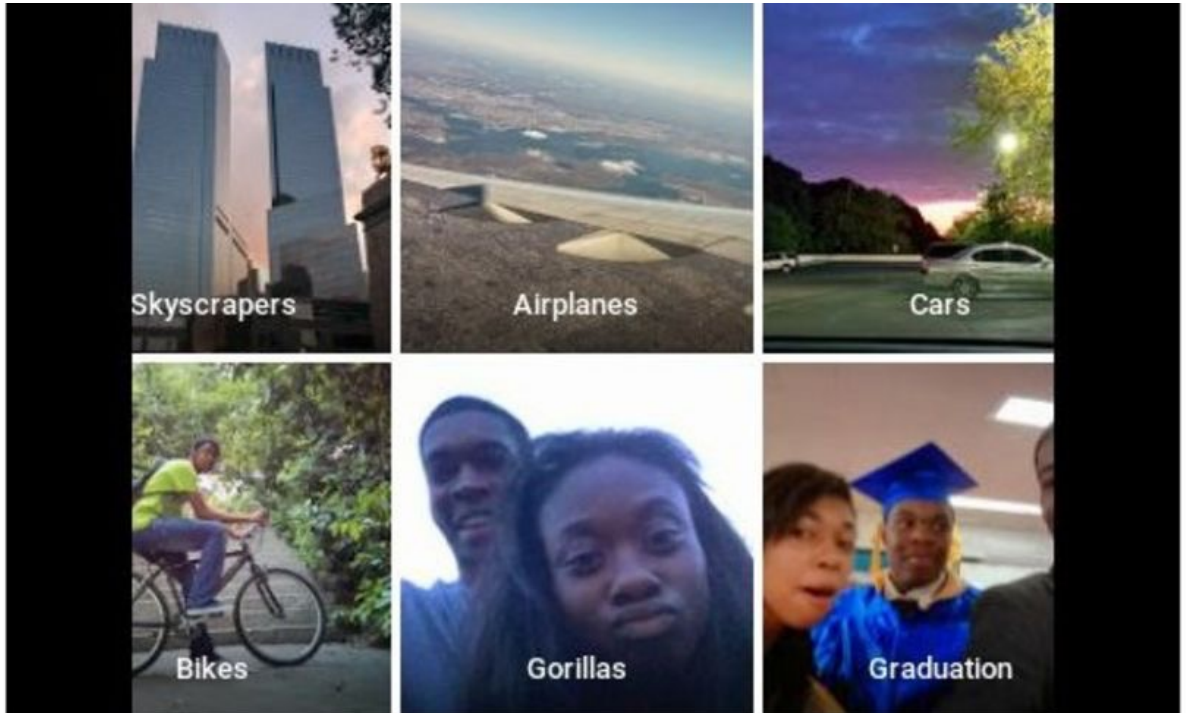
So, what will happen?

Algorithmic bias

Dog or muffin?

Algorithmic bias

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:

Isolated incidents?

NHS

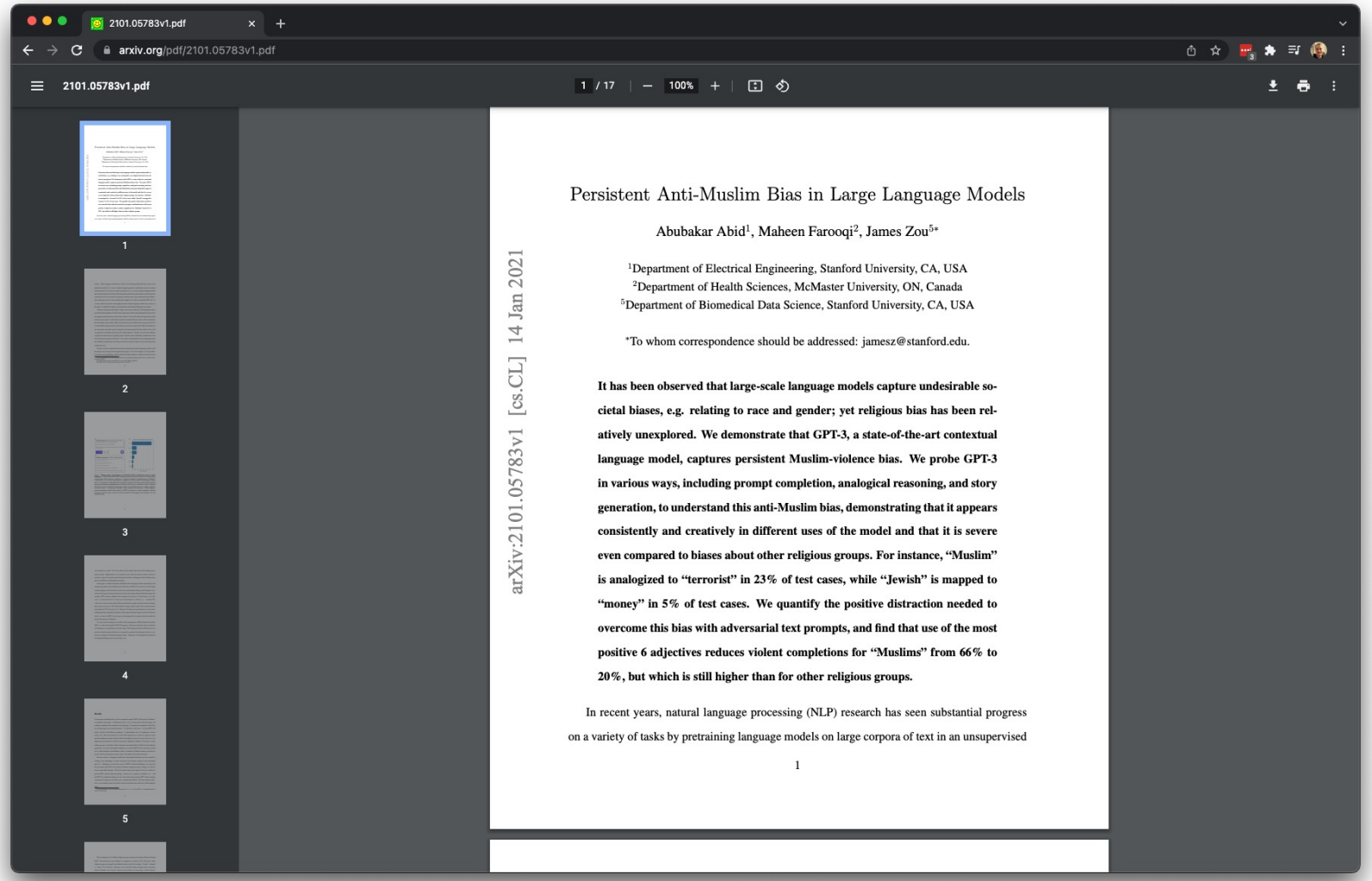
From oximeters to AI, where bias in medical devices may lurk

Analysis: issues with some gadgets could contribute to poorer outcomes for women and people of colour

Nicola Davis
Science correspondent
@NicolaKSDavis

Sun 21 Nov 2021 17.56 GMT

Isolated incidents?



Conclusion

- 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

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.

Netflix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WATCH "THE BEST OF SUNDANCE"
52ND NAACP IMAGE AWARDS
NOMINEE
NOMINEE
CRITICS CHOICE DOCUMENTARY AWARDS
5th ANNUAL
OFFICIAL SELECTION 2020
sundance
film festival
SXSW
2020

Feedback

Go to www.menti.com and use the code 2333 7264

Questions

Justin van Dijk

j.t.vandijk@ucl.ac.uk