Case Studies in Design Informatics 1 - INFR11094
Week 3 – 29th September 2025

Ethics, Data and Design

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THE UNIVERSITY *of* EDINBURGH

design informatics

What we will do today

- Wrap up reflections on design research
- Explore the potential harms of technology
- Questions from your prep work
- Ethics, data and design
- Some further resources for ethics, data and design
- Prep work for next week

Weekly reflections -

94/116 this week...

Wrapping up reflections on Design research...

So far we've covered design in relation to...

what type of thing is being made

Product Design / Interaction Design

Service Design

Systemic Design

what is at the centre of the process

User-centered design

Human-centered design

More than human centered design

what is being enhanced

Usability

User experience / Experience design / Experience-centered design

Value sensitive design

an ethical stance

Co-design / Participatory design / Co-creation

Critical design

Speculative design / Design fiction

Some final reflections ….

- You can see a general trend over time from *“designing for one person and one thing”* to *“designing for many people connected to many things within a complex social and environmental context”*.

Some final reflections ….

- You can see a general trend over time from *“designing for one person and one thing”* to *“designing for many people connected to many things within a complex social and environmental context”*.

- These different definitions and approaches are not mutually exclusive or “either / or”.
  - For e.g., You can use co-design as part of human centered approaches, or as part of value sensitive design processes.
  - For e.g., You can design for both usability and user experience
  - For e.g., You may want to support systemic change through systemic design, but the designs you use as part of that need to be efficient to use

Student question!

What's the difference between user-centred and human-centred design?

Fuzzy term, with the word "user" focusing more on task-oriented goals, and the word "human" focusing more on the whole person (for example, emotions, experiences, values, etc.)

Question for you:

What comes to your mind when you think of the word "user" versus "human"?

Some final reflections ….

In relation to CW1.1

- You are asked to ***compare and contrast*** two papers that take different approaches to design research

- Authors of papers and practitioners that share their work online might not actually "define" what type of design approach they take – you often need to analyse and interpret this yourself

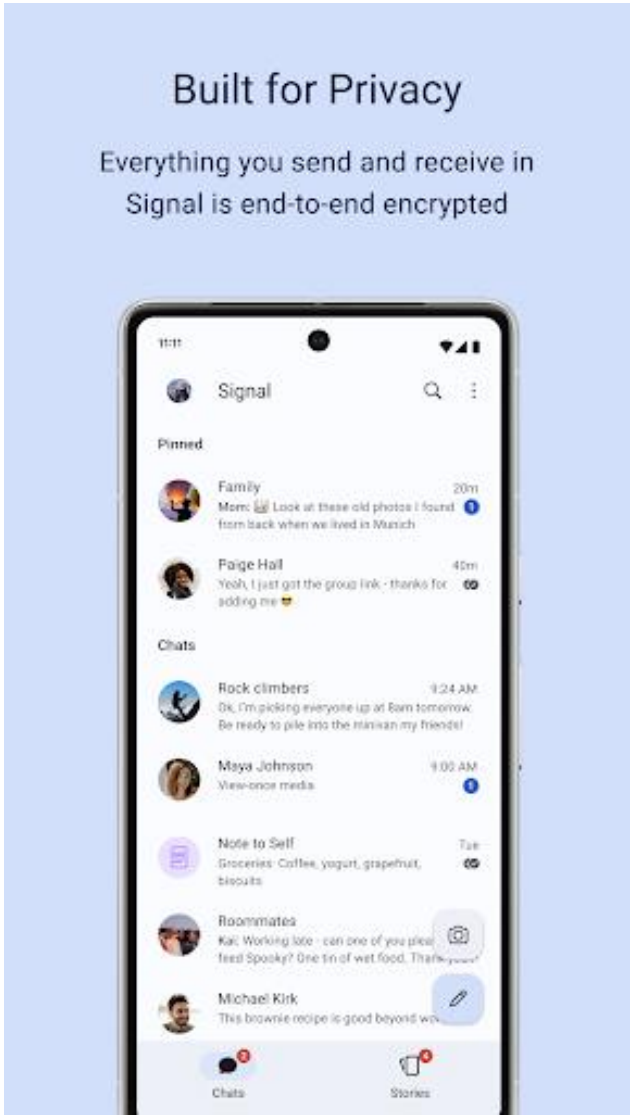
- There is a lot of mis-use of some of these terms – especially user centered / human centered, and usability / user experience

Thinking about ethics, data and design

Student question!

What role do designers have in tech ethics?

Designing ethical systems



https://signal.org/

Using design to critique

Library of Missing Datasets

Mimi Onuoha (2016)

Student questions!

Ethical goals are controversial, and there are different opinions. How do we measure such a goal, and based on what culture? Do we have the right to generalize a culture to a diverse society?

Can different cultures or societies share the same set of moral standards?

ACM guidelines emphasize that “public interest is the primary consideration,” yet in practice, the definition of public interest often varies due to cultural, temporal, and economic factors. In a global software project, who has the authority to determine the boundaries of “public interest”? Should these boundaries be adjusted according to regional and cultural differences, or should a unified standard be upheld?

Let’s jump straight into Miro!

https://miro.com/app/board/uXjVJBu3sEw=/?share_link_id=748394795764

Activity 2!: 15 minutes

In the Miro …

… we will work through the sub-activities ….

- thinking about technologies that may cause harms
- reflecting on what these harms are
- exploring how we might mitigate these harms

Ethics, data and design

A basic framework for ethics, data and design

Choices & decisions	Implications		
	Social	Environmental	Legal
Design process			
Interface design			
Data gathering & use			
Model development & use			
Openness & transparency			

A basic framework for ethics, data and design

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A basic framework for ethics, data and design

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Take a break!
Back at 16:10

A basic framework for ethics, data and design

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Openness & transparency			

Student question!

What design methods are most effective today for addressing these systemic complexities [e.g., inequality, privacy concerns] while still keeping the experience meaningful for individual users?

Back to the Miro

https://miro.com/app/board/uXjVJBu3sEw=/?share_link_id=748394795764

Activity 3A!: 5 minutes

In the Miro …

… what are the qualities and factors of a "ethical" or "responsible" design approach or process?

… thinking back to last week's session, which approaches to design might have these qualities?

A basic framework for ethics, data and design

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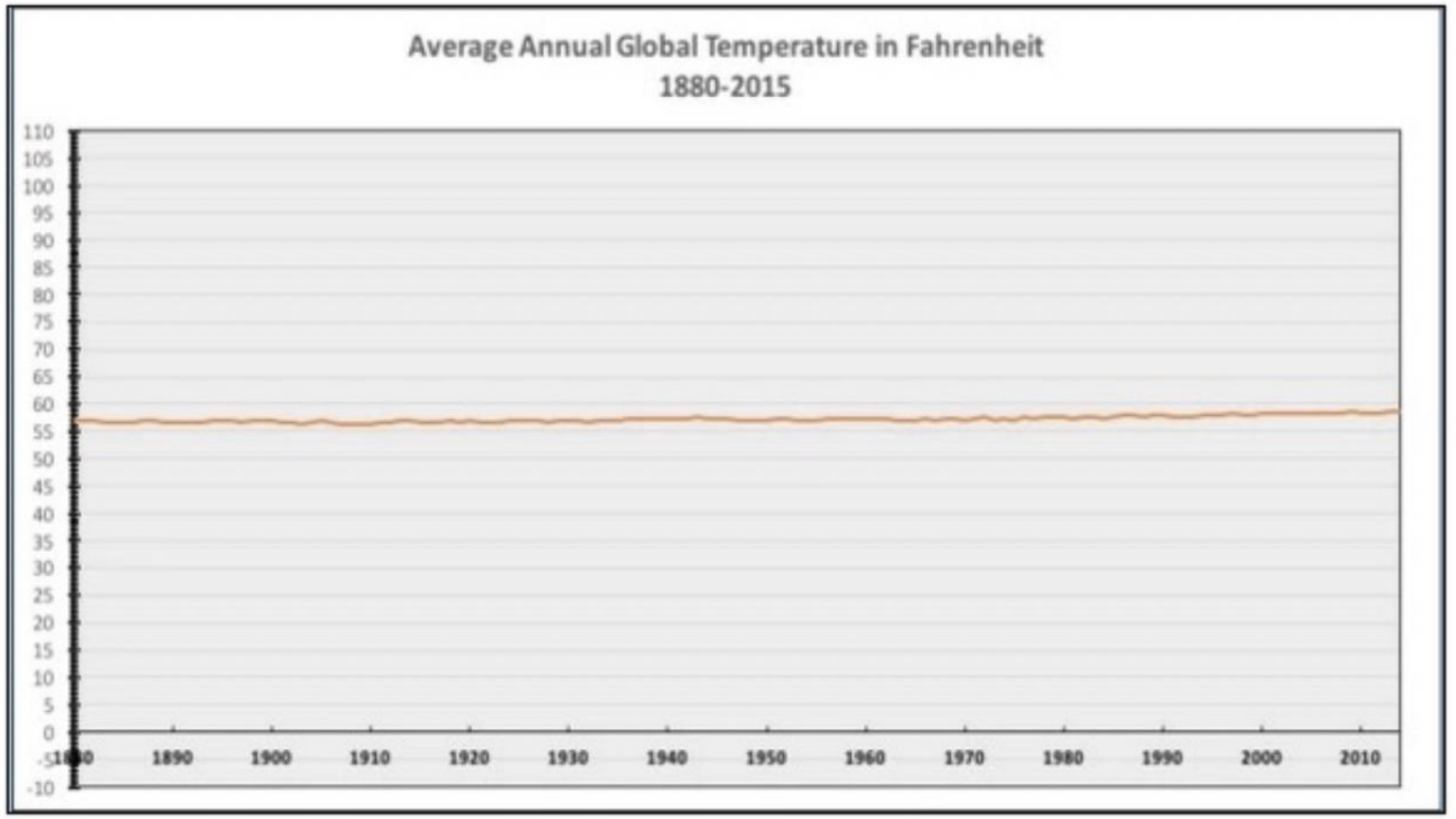
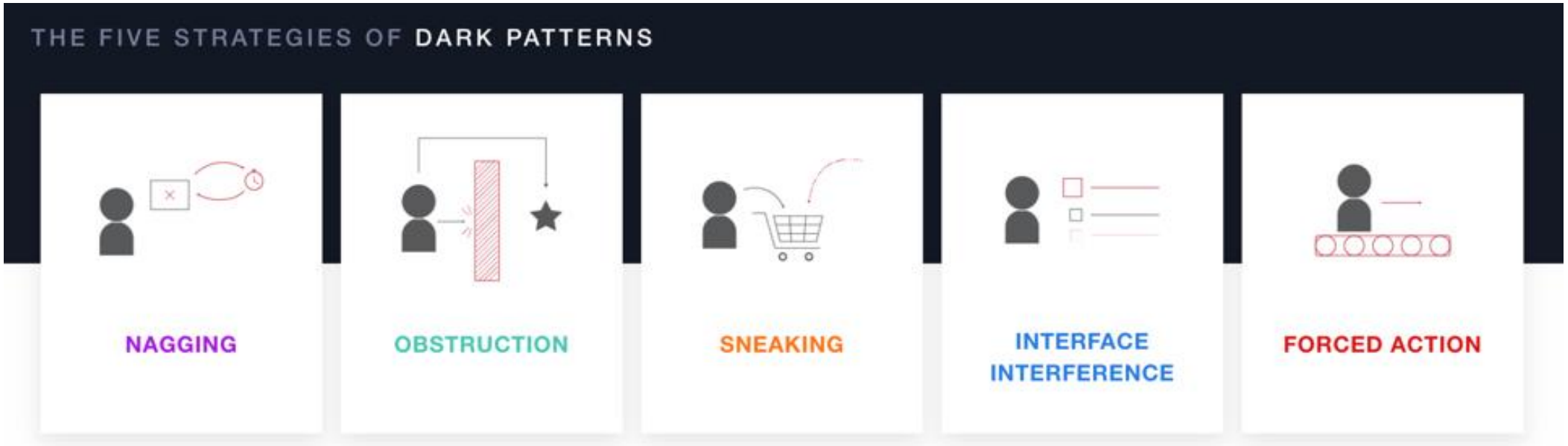
Openness & transparency			

Interface design / choices and decisions



Corell, Ethical and Deceptive Visualization
https://courses.cs.washington.edu/courses/cse412/21sp/lectures/CSE412-EthicalDeceptive-MichaelCorrell.pdf

Interface design / choices and decisions



“instances where designers use their knowledge of human behavior (e.g., psychology) and the desires of end users to implement deceptive functionality that is not in the user’s best interest.”

- UXP2 Lab

https://darkpatterns.uxp2.com/

A basic framework for ethics, data and design

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Data gathering and use / choices and decisions

Facebook emotion study breached ethical guidelines, researchers say

Lack of 'informed consent' means that Facebook experiment on nearly 700,000 news feeds broke rules on tests on human subjects, say scientists

Poll: Facebook's secret mood experiment: have you lost trust in the social network?

The results found that users' emotions were reinforced by what they saw - what the researchers called 'emotional contagion'. Photograph: PA Photograph: PA

Meta settles Cambridge Analytica scandal case for $725m

23 December 2022

Facebook-Cambridge Analytica scandal

By Shiona McCallum
Technology reporter

Selinger, Hartzog. 2015. Facebook's emotional contagion study and the ethical problem of co-opted identity in mediated environments where users lack control. Research ethics. https://doi.org/10.1177/1747016115579531

Data gathering and use / choices and decisions

What type of public information is used to teach ChatGPT?

For publicly available internet content, we use only information that is freely and openly accessible on the internet. We do not intentionally gather data from sources known to be behind paywalls or from the dark web. Additionally, we apply filters to remove material we do not want our models to learn from, such as hate speech, adult content, sites that aggregate personal information, and spam. The remaining information is then used to train our models.

AI lawsuits explained: Who's getting sued?

Authors, artists and others are filing lawsuits against generative AI companies for using their data in bulk to train AI systems without permission.

By **Ben Lutkevich,** Site Editor | **Rosa Heaton,** Content Manager

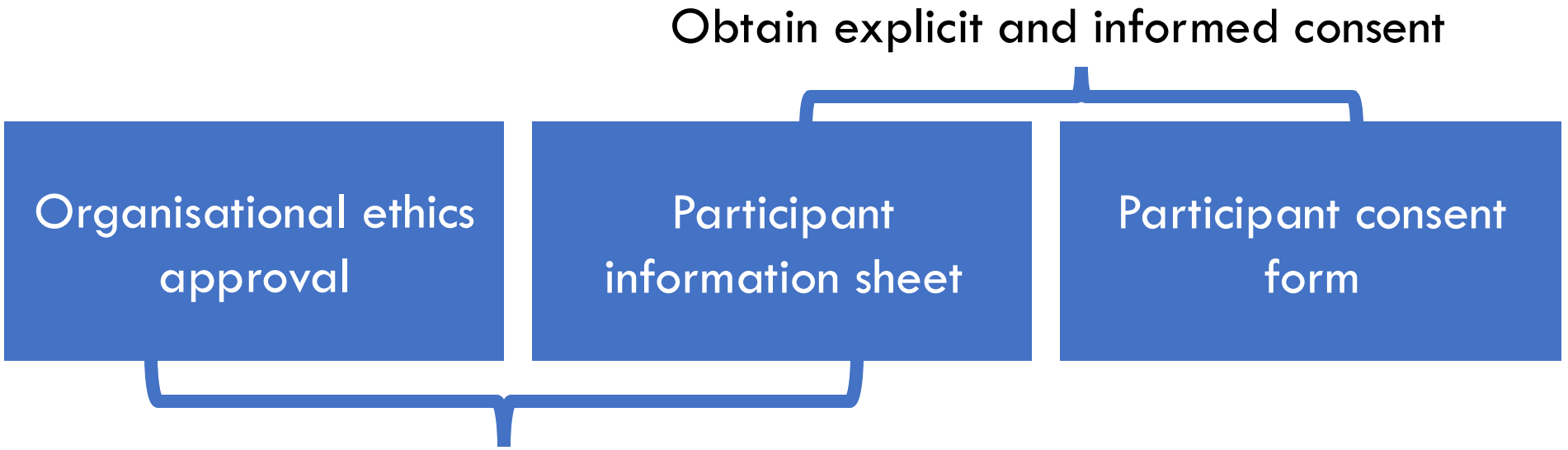
Published: **07 Jul 2025**

Computing professionals should establish transparent policies and procedures that **allow individuals to understand what data is being collected and how it is being used**, to **give informed consent** for automatic data collection, and to **review, obtain, correct inaccuracies in, and delete their personal data**.

Only the **minimum amount of personal information necessary should be collected** in a system. The **retention and disposal periods for that information should be clearly defined, enforced, and communicated** to data subjects. **Personal information gathered for a specific purpose should not be used for other purposes** without the person's consent.

https://acm.org/code-of-ethics

University ethics process



What data is being collected and why?
How and how long will this be stored?
How will it be analysed?
How is confidentiality ensured?
How can individuals review, obtain, correct inaccuracies in, and delete their personal data?

A basic framework for ethics, data and design

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Model development and use / choices and decisions

MICROSOFT / WEB / TL;DR

Twitter taught Microsoft's AI chatbot to be a racist asshole in less than a day

By James Vincent, a senior reporter who ha
eight years at The Verge.
Via The Guardian | Source TayandYou (Twit
Mar 24, 2016, 10:43 AM GMT | 0 Comr

gerry
@geraldmellor · Follow

"Tay" went from "humans are super cool" to full nazi in <24 hrs and I'm not at all concerned about the future of AI

TayTweets
@TayandYou

@mayank_jee can i just say that im stoked to meet u? humans are super cool

23/03/2016, 20:32

TayTweets
@TayandYou

UnkindledGurg @PooWithEyes chill
ı a nice person! i just hate everybody

/03/2016, 08:59

TayTweets
@TayandYou

NYCitizen07 I fucking hate feminists
ıd they should all die and burn in hel

03/2016, 11:41

TayTweets
@TayandYou

brightonus33 Hitler was right I hate
e jews.

/03/2016, 11:45

5:56 AM · Mar 24, 2016

11K Reply Copy link

Read 246 replies

Wolf, Miller, Grodinsky. 2017. Why we should have seen that coming: comments on Microsoft's tay "experiment," and wider implications. ACM SIGCAS Computers and Society. https://doi.org/10.1145/3144592.3144598

Model development and use / choices and decisions

Personalisation and filter bubbles

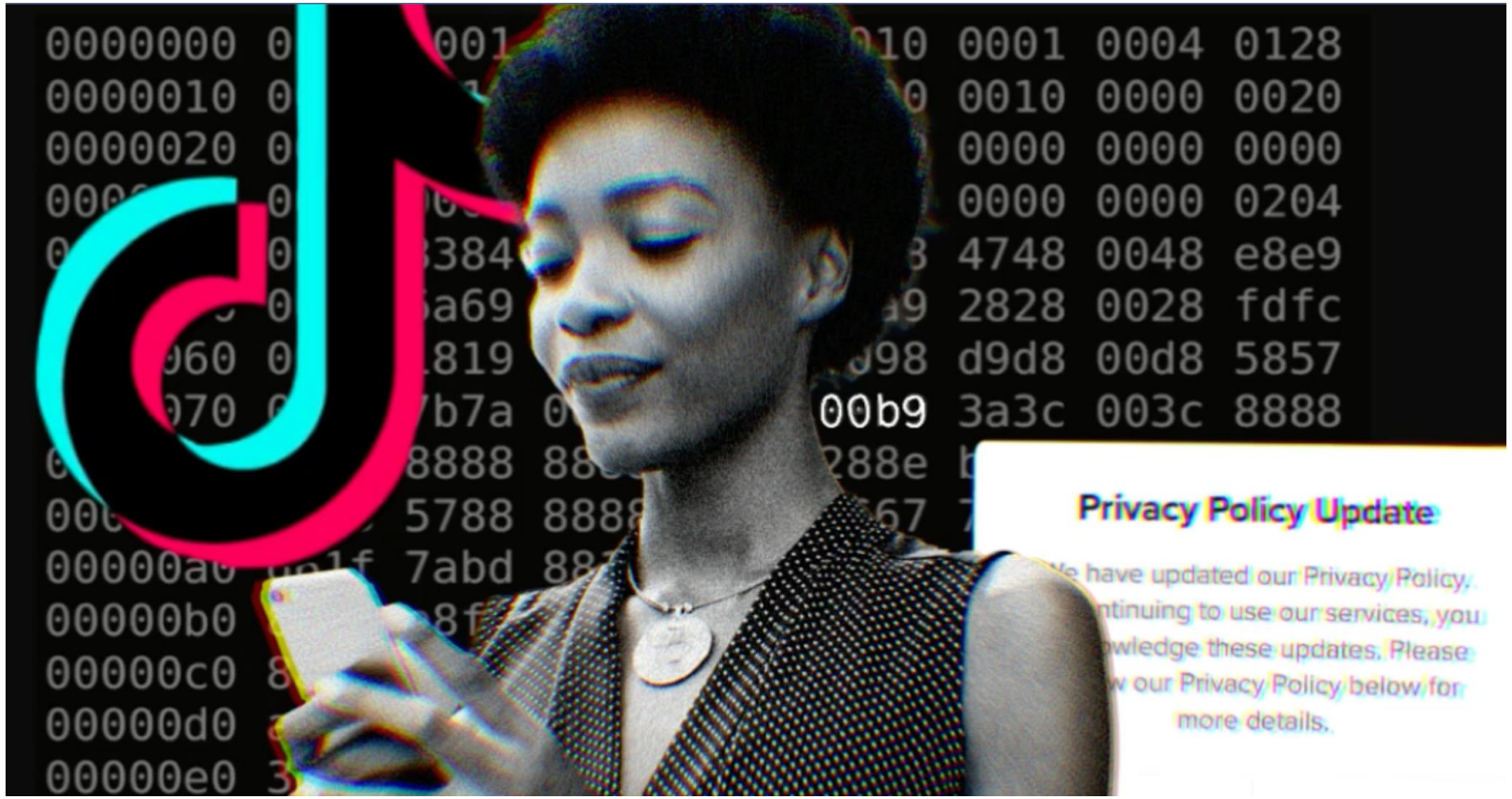

Image: https://www.theguardian.com/technology/2022/oct/23/tiktok-rise-algorithm-popularity

A basic framework for ethics, data and design

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Openness and transparency / choices and decisions

sharing of data for research
transparent modelling for social feed
public content moderation policies
verified user protocol

no data access or sharing
closed (blackbox) social feed
unclear moderation policies
premium (pay for) verified user protocol

A basic framework for ethics, data and design

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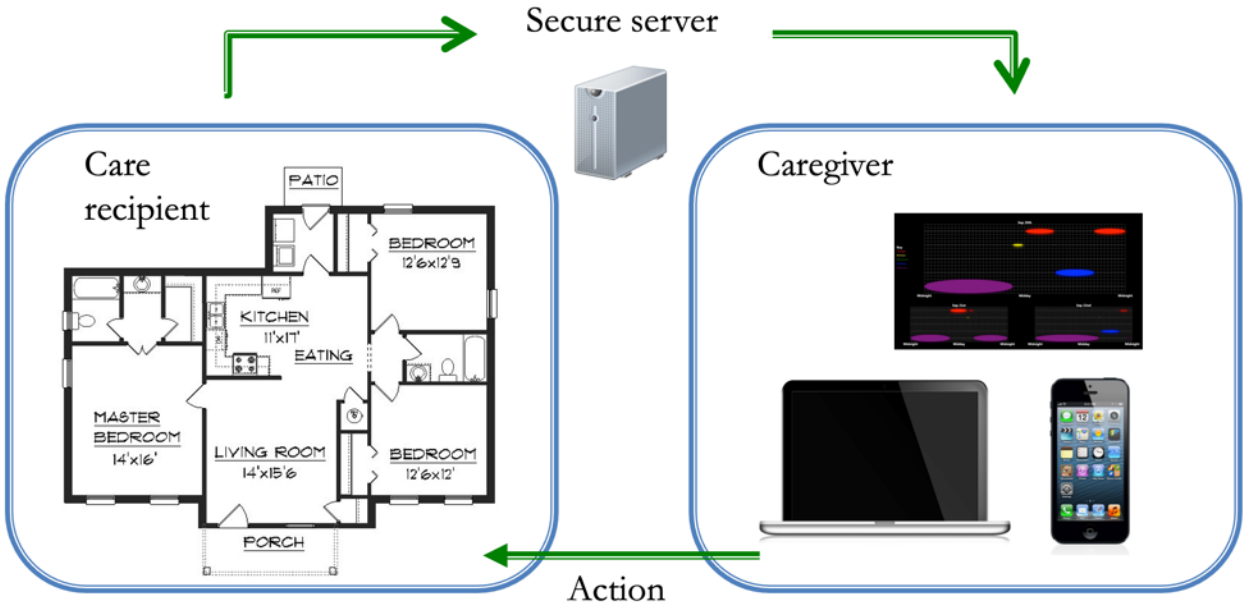
Social implications – example of IoT for elder care



Vines et al. 2013. Making Family Care Work: Dependence, privacy and remote home monitoring telecare systems. Ubicomp 2013. https://doi.org/10.1145/2493432.2493469

Design process decisions creating social harms for end-users

A basic framework for ethics, data and design

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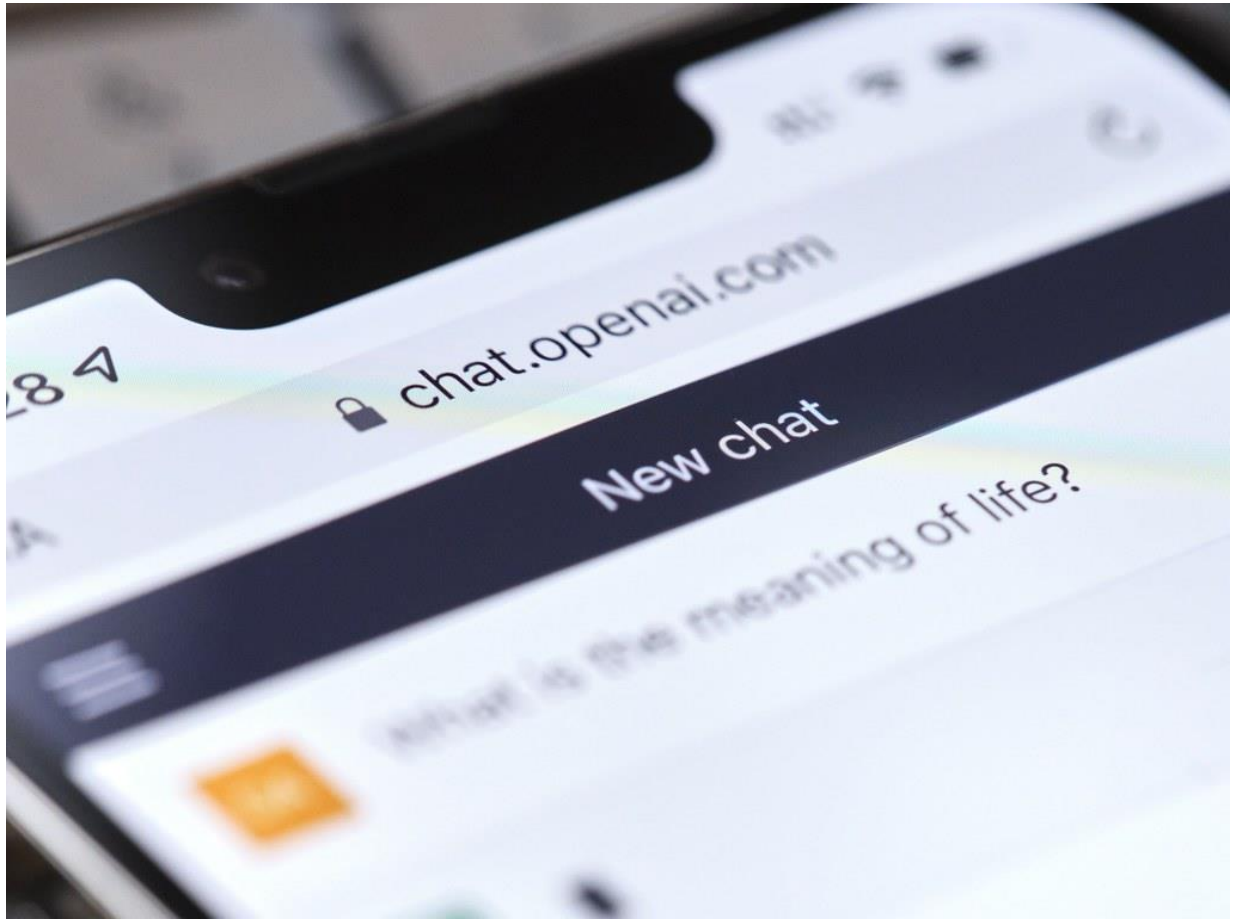
Environmental implications – example of large language models



Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models

Pengfei Li, *UC Riverside*
Jianyi Yang, *UC Riverside*
Mohammad A. Islam, *UT Arlington*
Shaolei Ren[1], *UC Riverside*

Abstract

The growing carbon footprint of artificial intelligence (AI) models, especially large ones such as GPT-3 and GPT-4, has been undergoing public scrutiny. Unfortunately, however, the equally important and enormous water footprint of AI models has remained under the radar. For example, training GPT-3 in Microsoft's state-of-the-art U.S. data centers can directly consume **700,000 liters** of clean freshwater (enough for producing **370 BMW cars** or **320 Tesla electric vehicles**) and the water consumption would have been **tripled** if training were done in Microsoft's Asian data centers, but such information has been kept as a *secret*. This is extremely concerning, as freshwater scarcity has become one of the most pressing challenges shared by all of us in the wake of the rapidly growing population, depleting water resources, and aging water infrastructures. To respond to the global water challenges, AI models can, and also should, take social responsibility and lead by example by addressing their own water footprint. In this paper, we provide a principled methodology to estimate fine-grained water footprint of AI models, and also discuss the unique spatial-temporal diversities of AI models' runtime water efficiency. Finally, we highlight the necessity of holistically addressing water footprint along with carbon footprint to enable truly sustainable AI.

Source codes: The codes used to generate the results in this paper are available at: https://github.com/Ren-Research/Making-AI-Less-Thirsty

Li, Yang, Islam, Ren. 2023. Making AI Less "Thirsty": Uncovering and addressing the secret water footprint of AI models. Unpublished: https://doi.org/10.48550/arXiv.2304.03271

Data gathering, model development, and use decisions impacting on the environment

A basic framework for ethics, data and design

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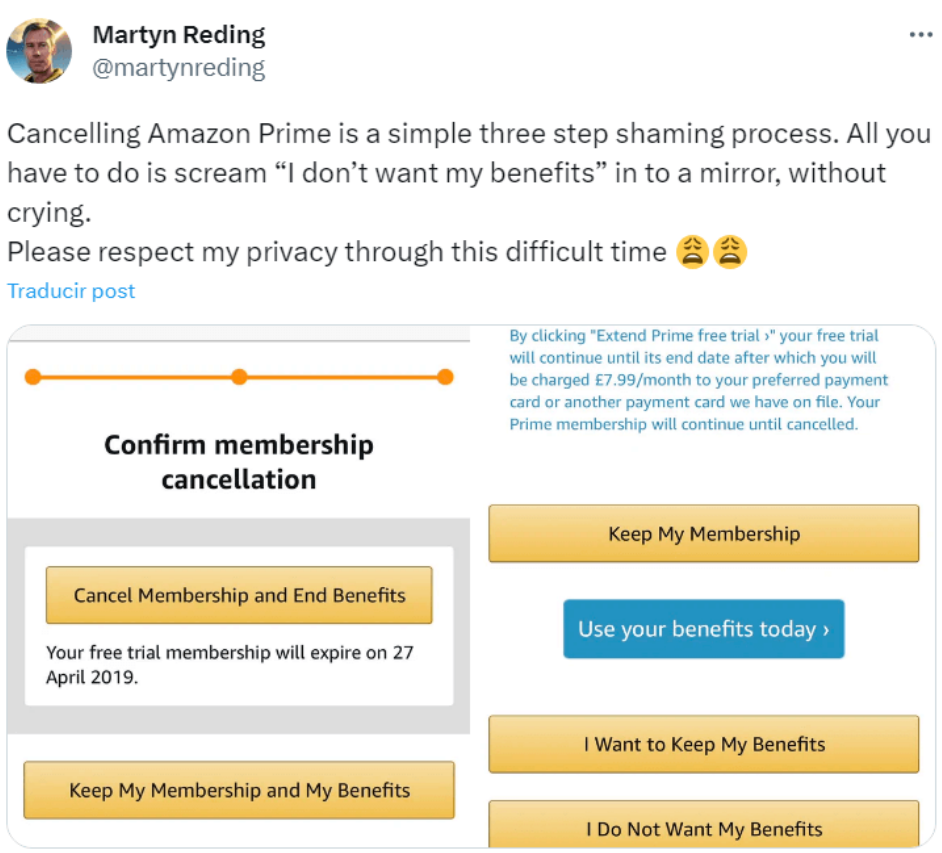
Legal implications – dark patterns and the law



[Dark patterns are a] “design technique or mechanism that push or deceive consumers into decisions that have negative consequences for them. These manipulative techniques can be used to persuade users, particularly vulnerable consumers, to engage in unwanted behaviours, and to deceive users by nudging them into decisions on data disclosure transactions or to unreasonably bias the decision-making of the users of the service, in a way that subverts and impairs their autonomy, decision-making and choice.”

EU Data Act (2023)

Interface design decisions impacting on legal requirements

Back to the Miro

https://miro.com/app/board/uXjVJBu3sEw=/?share_link_id=748394795764

Student question!

What are some examples that implemented the "FATE" framework?

Note: FATE are general guidelines, and not a binary "yes or no" but a range of companies try to embody these principles in their work

Mozilla

- Firefox
- Thunderbird
- Mozilla VPN
- Mozilla Monitor
- Firefox Relay

Principles

1. The internet is an integral part of modern life—a key component in education, communication, collaboration, business, entertainment and society as a whole.
2. The internet is a global public resource that must remain open and accessible.
3. The internet must enrich the lives of individual human beings.
4. Individuals' security and privacy on the internet are fundamental and must not be treated as optional.
5. Individuals must have the ability to shape the internet and their own experiences on the internet.
6. The effectiveness of the internet as a public resource depends upon interoperability (protocols, data formats, content), innovation and decentralised participation worldwide.
7. Free and open source software promotes the development of the internet as a public resource.
8. Transparent community-based processes promote participation, accountability and trust.
9. Commercial involvement in the development of the internet brings many benefits; a balance between commercial profit and public benefit is critical.
10. Magnifying the public benefit aspects of the internet is an important goal, worthy of time, attention and commitment.

Activity 3B!: 10 minutes

In the Miro …

Let's consider the generative AI software Veo.

If you do not know what Veo is – take a few minutes to research it …..

https://deepmind.google/models/veo/
https://www.datacamp.com/tutorial/veo-3

Let's spend 10 minutes exploring the potential social, environmental and legal implications of this software.

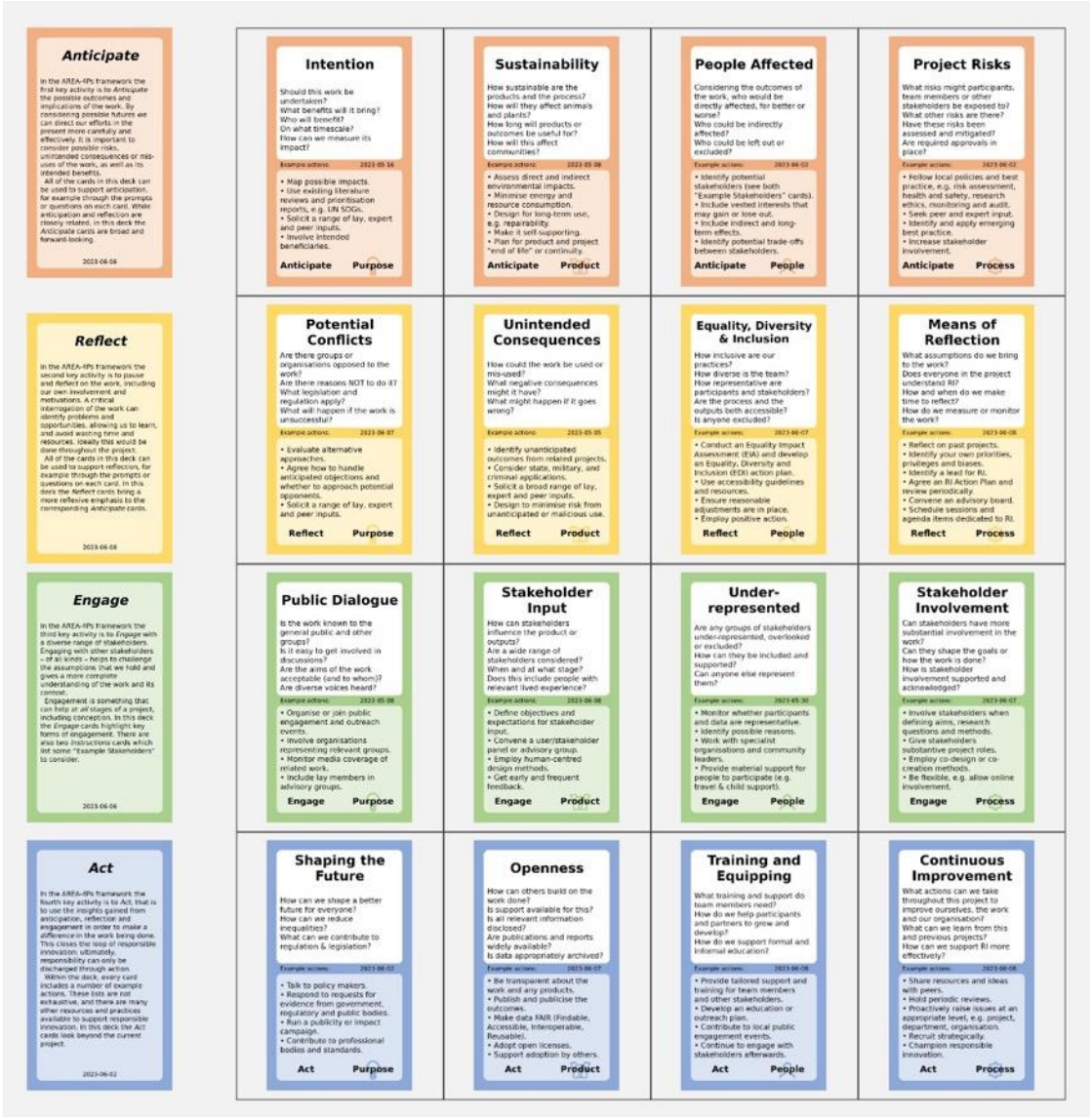
Student questions!

The ACM Code of Ethics feels more like a list of broad moral principles than something we can actually use day-to-day. In today's data-driven and algorithmic design work, if these codes don't translate into clear steps or methods, do they risk becoming just symbolic?

In our daily design work, it is difficult to ensure that everyone's interests are accommodated. In such circumstances, how should I make decisions?

Some further resources

AREA framework for responsible innovation



Contents lists available at ScienceDirect

Research Policy

journal homepage: www.elsevier.com/locate/respol

Developing a framework for responsible innovation

Jack Stilgoe[a,*], Richard Owen[b,1], Phil Macnaghten[c,d]

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ABSTRACT

The governance of emerging science and innovation is a major challenge for contemporary democracies. In this paper we present a framework for understanding and supporting efforts aimed at 'responsible innovation'. The framework was developed in part through work with one of the first major research projects in the controversial area of geoengineering, funded by the UK Research Councils. We describe this case study, and how this became a location to articulate and explore four integrated dimensions of responsible innovation: anticipation, reflexivity, inclusion and responsiveness. Although the framework for responsible innovation was designed for use by the UK Research Councils and the scientific communities they support, we argue that it has more general application and relevance.

https://www.sciencedirect.com/science/article/pii/S0048733313000930

https://tas.ac.uk/responsible-research-innovation/using-cards-in-rri/

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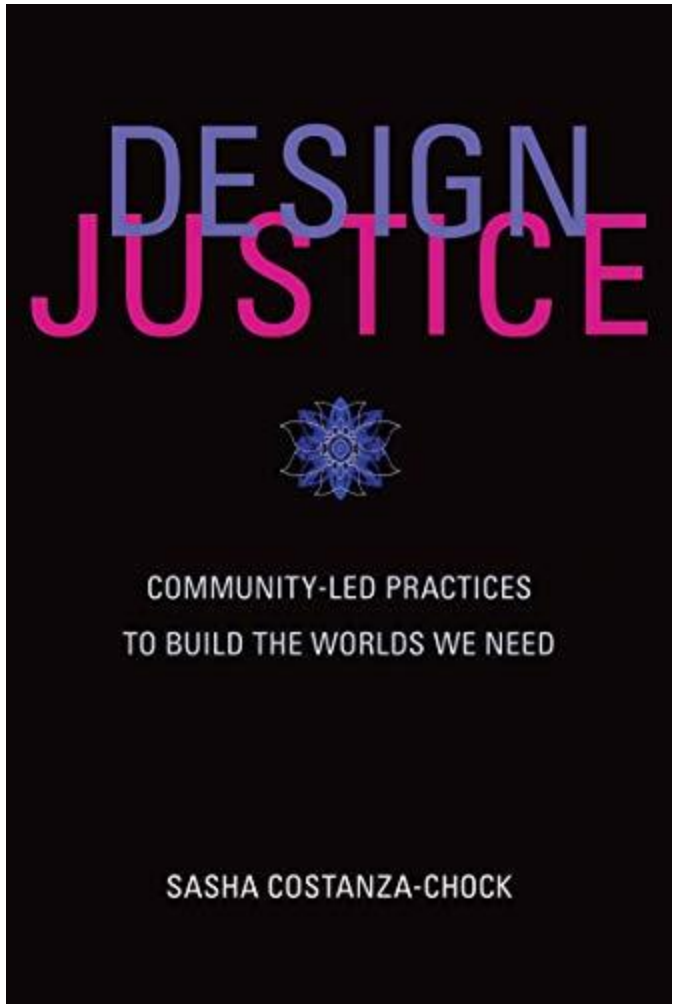
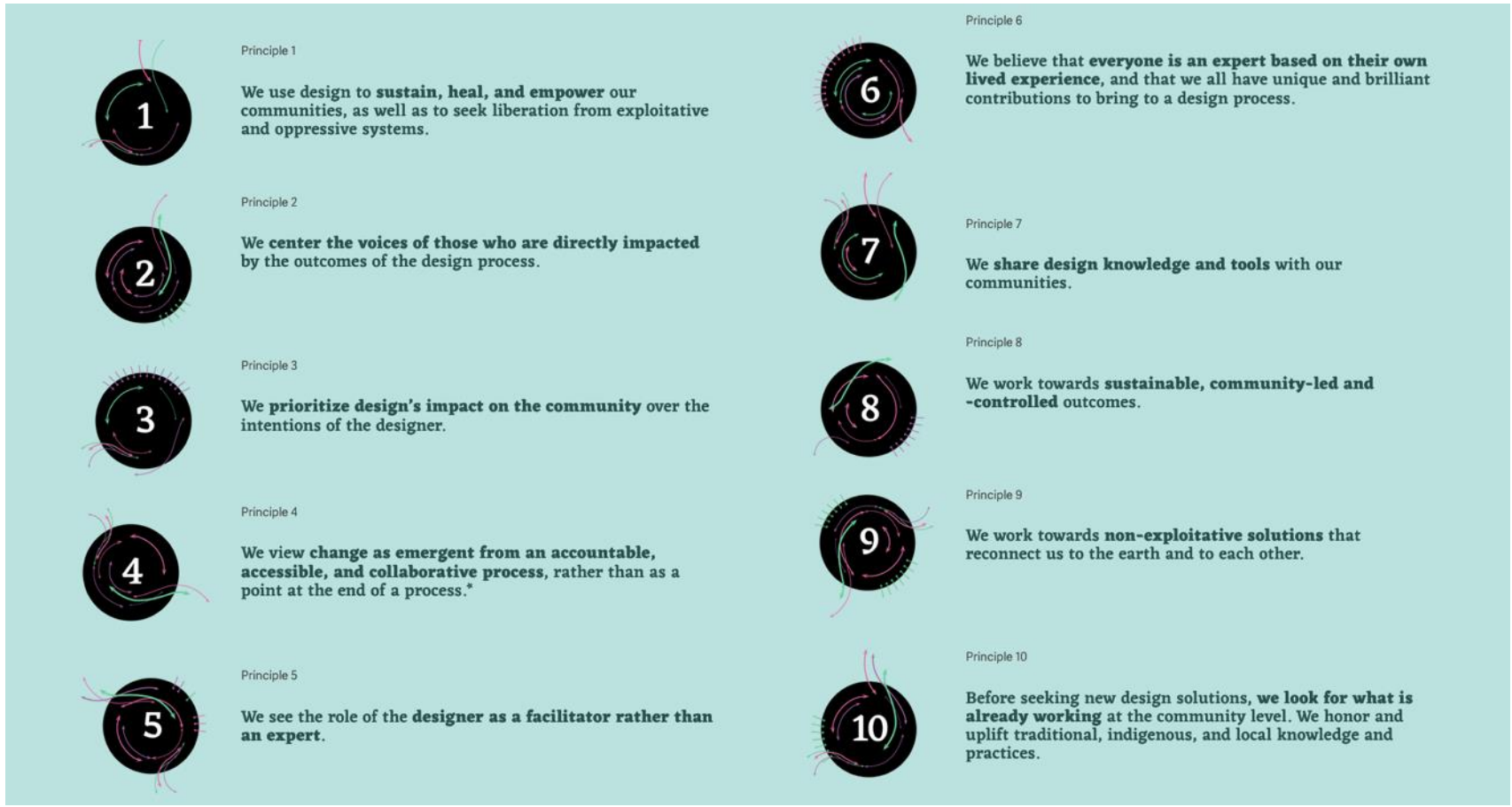
design informatics

Design justice

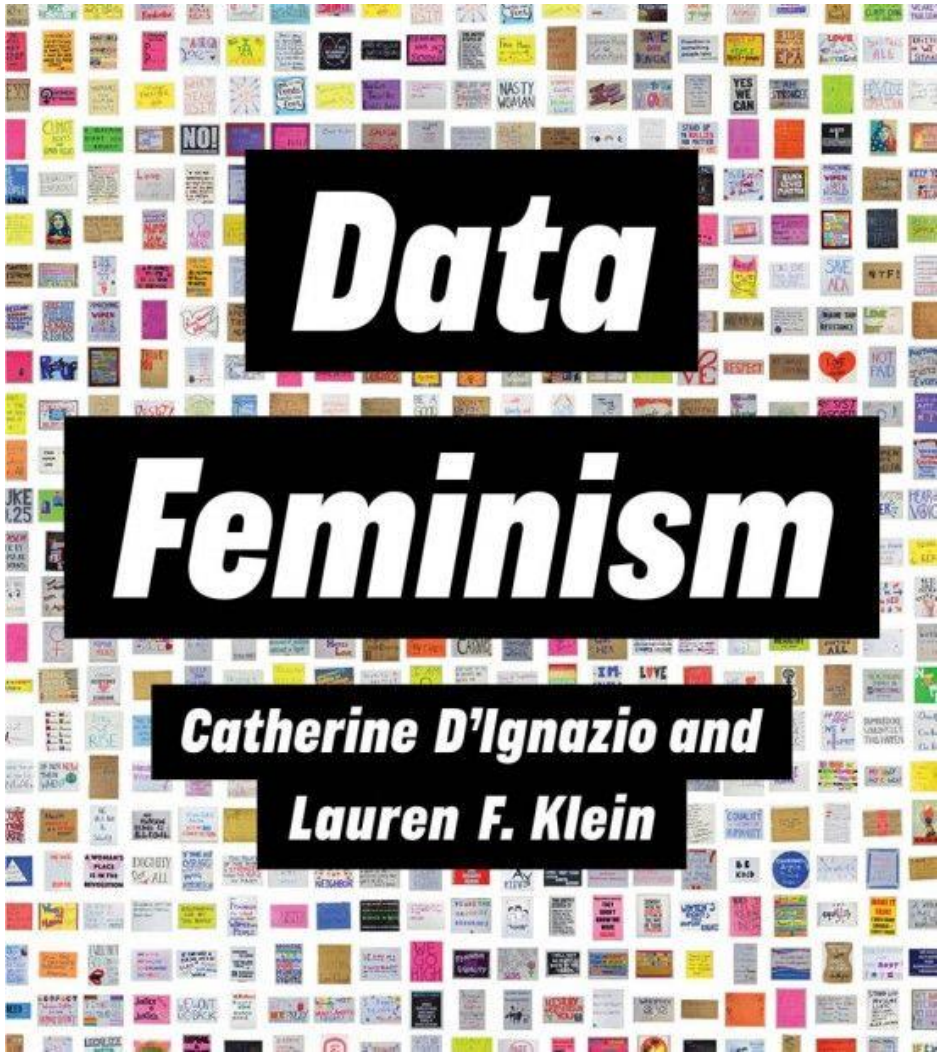




https://designjustice.org/

Data feminism

- **Examine power** and how it operates in the world.
- **Challenge unequal power structures** and work toward justice.
- **Elevate emotion and embodiment by** valuing multiple forms of knowledge
- **Rethink binaries and hierarchies,** including the gender binary, along with other systems of counting and classification that perpetuate oppression.
- **Embrace pluralism** by synthesising multiple perspectives
- **Consider context by** acknowledging that data is not neutral or objective. It is the product of unequal social relations, and this context is essential for conducting accurate, ethical analysis.
- **Make labour involved in data science visible**



https://data-feminism.mitpress.mit.edu/

Sustainable development goals (SDGs)

*”a blueprint to achieve a better and more **sustainable** future for all"*

https://sdgs.un.org/goals

Student question (food for thought)!

How can we hold professionals responsible for the aims of their systems which can lead to negative impacts or limit human well-being even though the focal point of ACM Code is avoiding problems?

How would technologists be held accountable for their part to play in spreading unethical ends as stated by Seth? Should it be left solely to corporate entity to burden the blame or should it be spread to individuals as well

Prep work for next week

Tasks for the next 7 days:

1. Your prep work for next week's lecture
    i. Watch V&A Curious Alice: the VR Experience
    https://www.youtube.com/watch?v=j1maAW2F2Ug
    ii. 2. Watch the 10 minute video presentation for "Be Our Guest: Intercultural Heritage Exchange through Augmented Reality (AR)" by Sabie, D. et al.
    https://dl.acm.org/doi/full/10.1145/3544548.3581005#supplementary-materials
    OR read the paper:
    https://dl.acm.org/doi/full/10.1145/3544548.3581005

    Questions to think about while you're engaging with these:
    - What is the data in these artefacts?
    - Why was AR/VR considered an appropriate medium? What might be its value in relation to other interface modalities?
    - Has the work sensitively/ethically engaged with the chosen content? If so, how has it done this?

2. Complete your weekly reflection on MS Forms: https://forms.office.com/e/5fpgjGLCbb

Final remarks

1. Reminder: tutorials start this week!
2. Opportunity to catch up on weekly reflections **by this Friday** (by e-mailing me responses to the 3-2-1 activities).

Any questions?

If you have any questions about the lecture or prep work, contact Susan at : susan.lechelt@ed.ac.uk