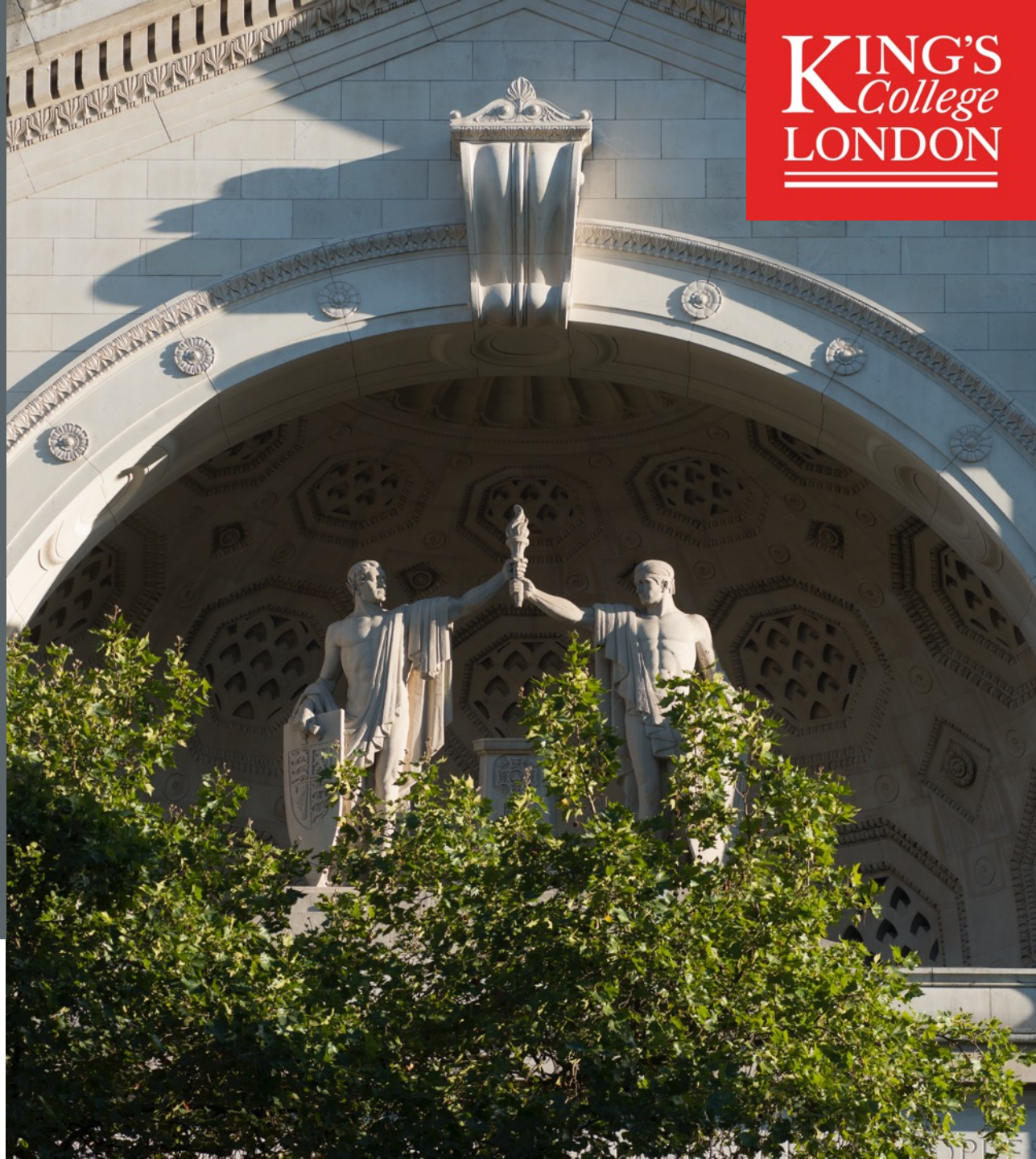
Reimagining research ethics to include environmental sustainability

Dr Gabrielle Samuel
Gabrielle.Samuel@kcl.ac.uk
@gabriellesamue1



KING'S College LONDON

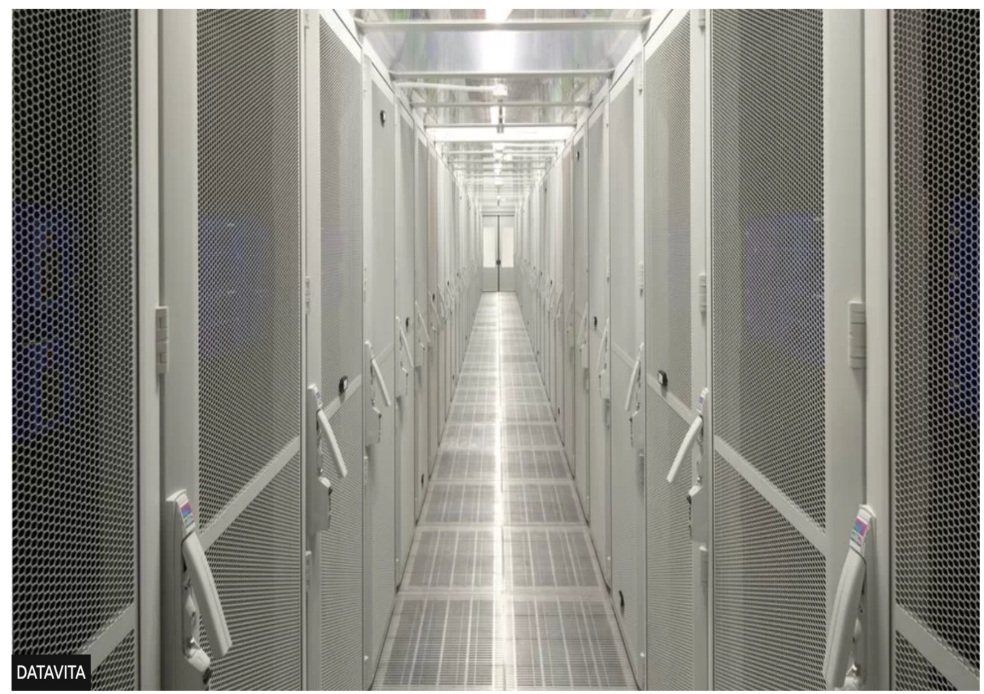
wellcome

Format of talk

- Describe adverse environmental and associated impacts of digital research endeavours
- Need for normative consideration in research processes
- Historically, research ethics governance frameworks do not explicitly consider these impacts
- Propose modification of Emmanuel et al.'s (2008) international research ethics framework
- Describe what this would look like in practice
- Describe why it is difficult to implement in practice

Digital Tech: material

https://www.bbc.co.uk/news/technology-67053139?utm_campaign=The%20Week%20in%20Data%20TWID&utm_medium=email&utm_content=278212966&utm_source=hs_email



Inside DataVita's Fortis data centre in Scotland's central belt

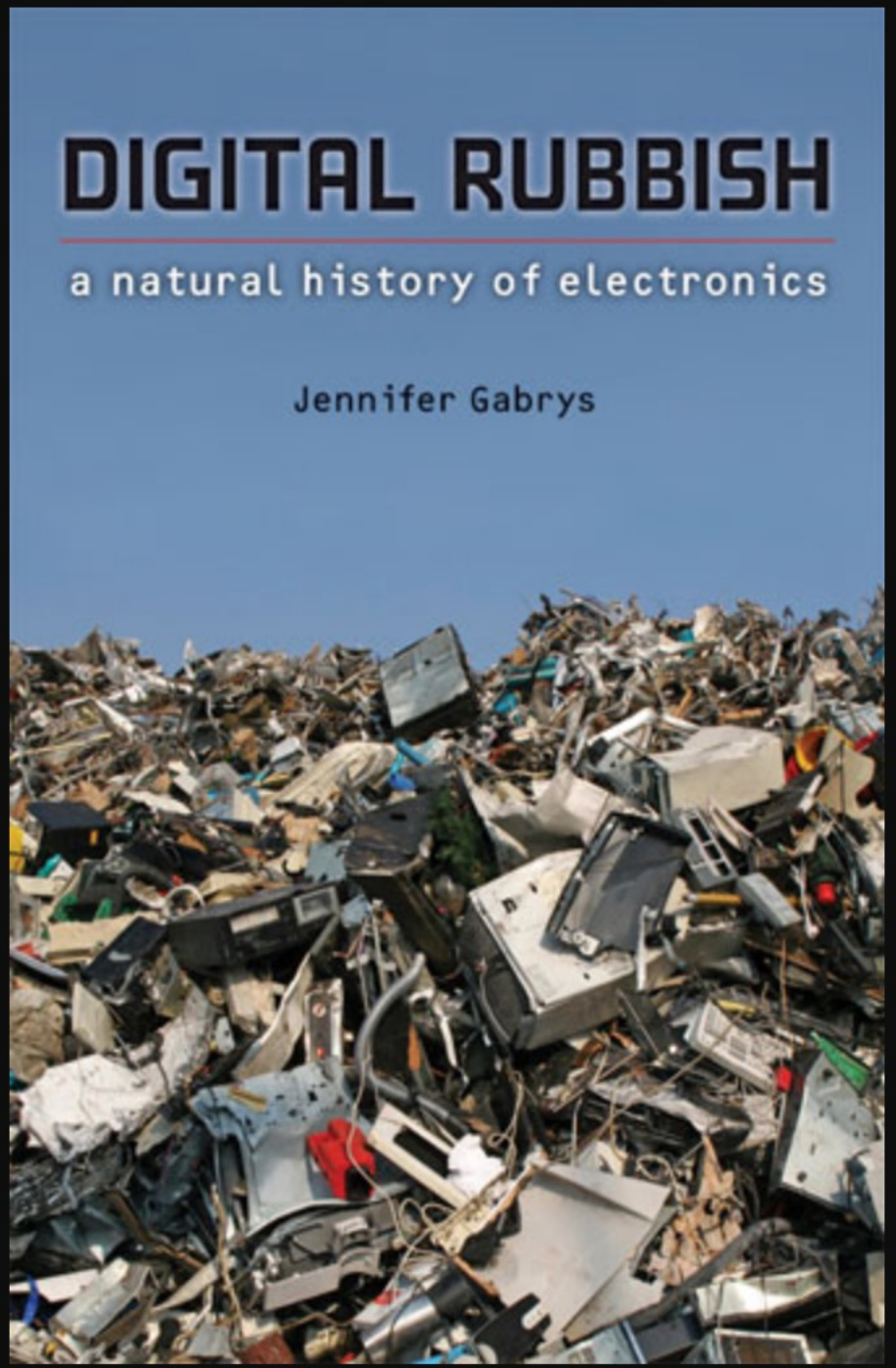
Digital Tech: relies on mining

Digital Tech: has high energy demands

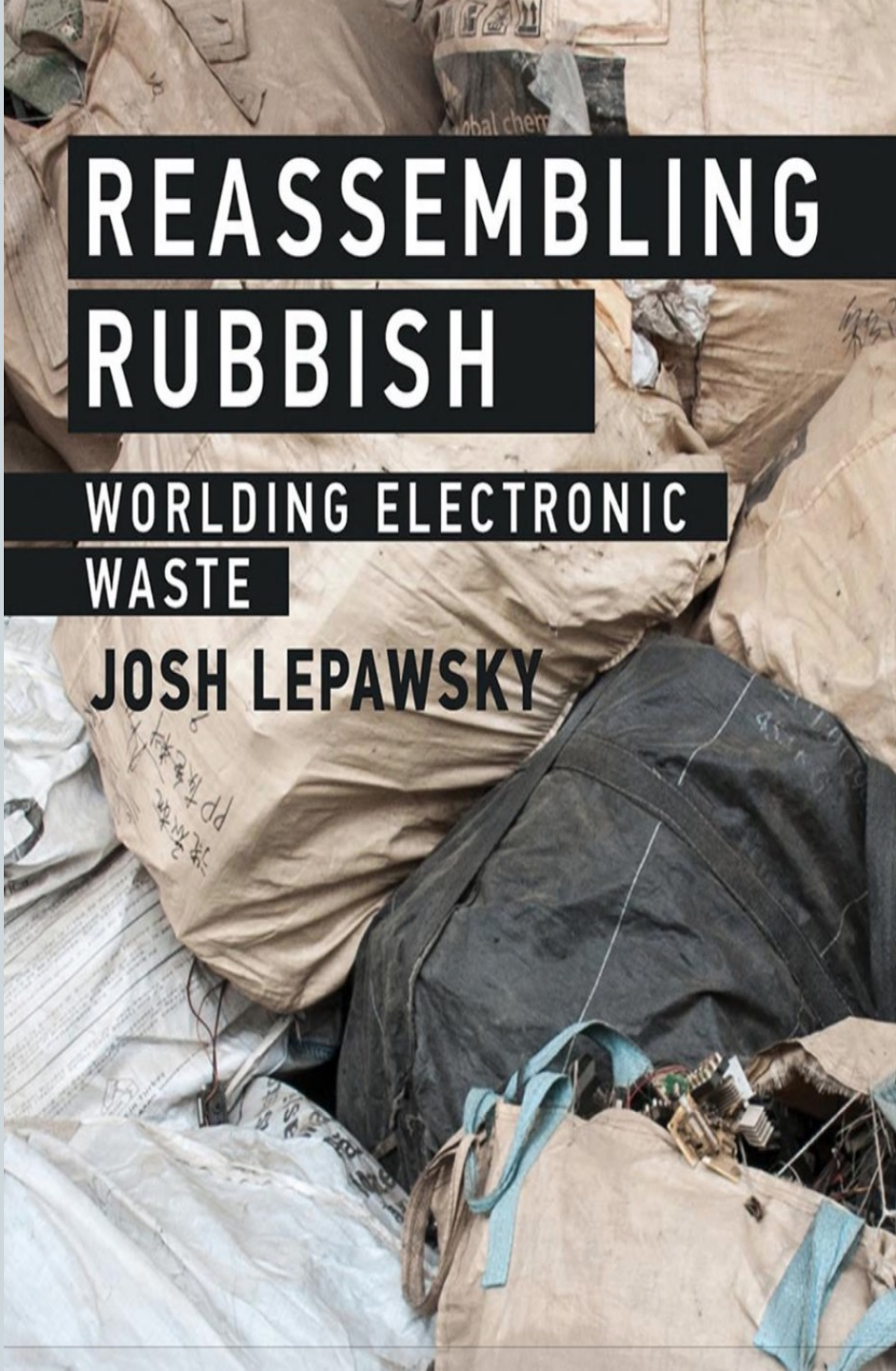
*relates to GHG emissions, depending on the country

https://www.orangewebsite.com/articles/data-center-pollution/

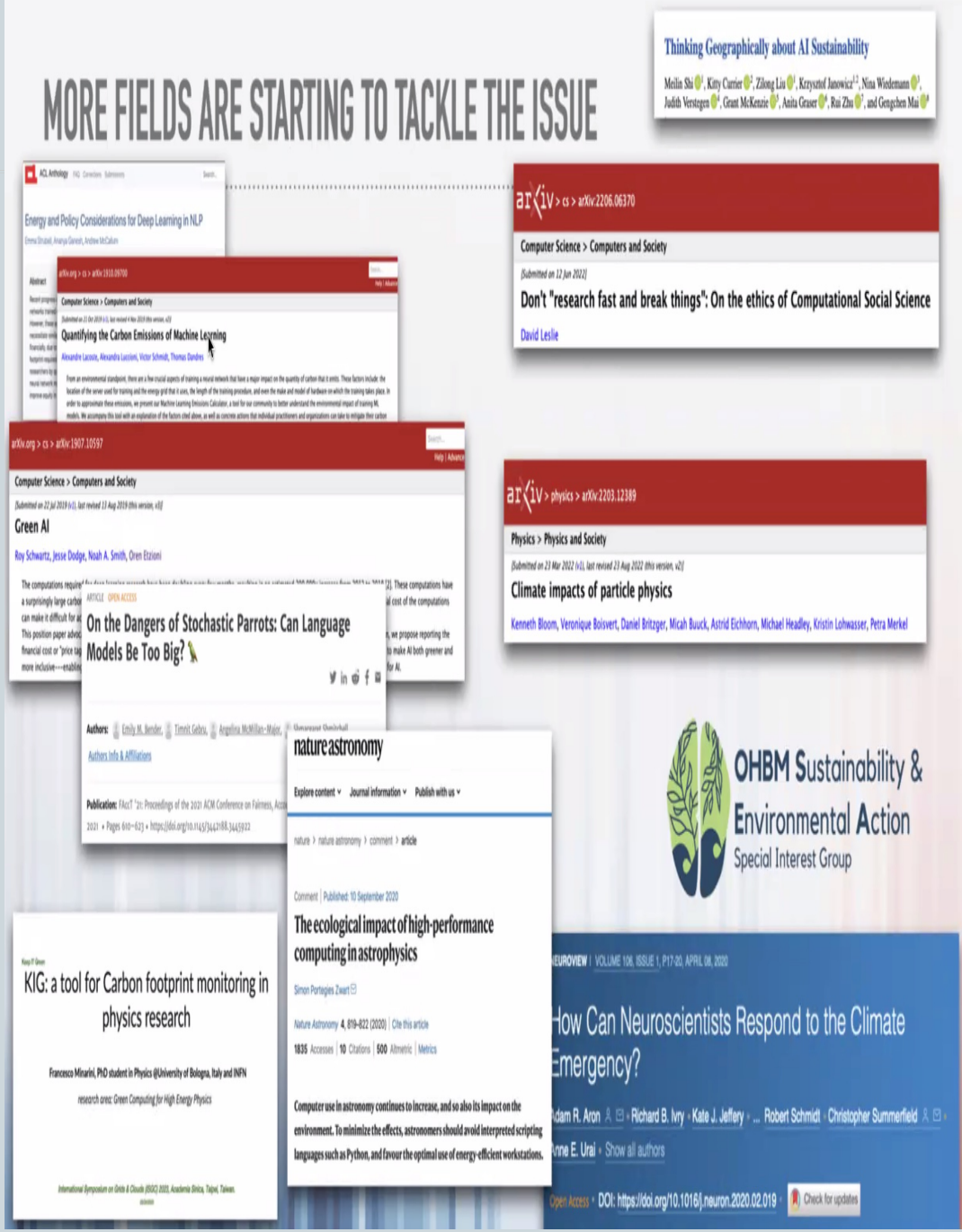
Digital Tech: associated with e-waste



….including during manufacturing



….change is happening



Ethical justification for change

1. Utilitarian: failing to consider the burdens associated with the manufacture, use and disposal of digital technologies creates imbalances in any utilitarian decision-making approach because it means ignoring key links in the consequentialist pathway that are associated with harms that come from the use of these technologies during the research process. Pierce and Jameton (2004) argue that when these burdens are added, 'everyday decisions unquestioned by ethicists and regarded as rational and even praiseworthy may be seen as questionable and possibly maleficent' (p119).

2. Justice: is a key underlying principle of many modern day societies. In a globalised world, to be just means ensuring the fair and equitable distribution of benefits and burdens not only within national boundaries but for all those who are subject to a given governance structure. Understandings of justice developed in recent decades argue that all individuals and communities affected by a particular process, technology and/or product wherever they are in the world, and whatever aspect of the product/process/technology they are affected by have moral standing and should be the subjects of justice considerations (e.g. Marion Young / Fraser's, 'all subjected principle')

Current research ethics frameworks

- Historically revolved around ethics principles concerned with the protection, rights, safety, and welfare of individual research participants
- Respect for community emphasised to sit alongside individually focused principles
  - Community harms = more than the sum of individual values and interests (will communities be beneficiaries of the research/share the same goals)
  - e.g. how an AI algorithm to detect skin cancer was shown to have been optimised for fair skin, being less able to detect Melanoma on darker skin
  - e.g. using AI for diagnosis given issues with recognising certain faces

- Moral gaze focuses only on humans, and only on particular humans. One of two things needs to happen (depending on your philosophical beliefs):
- Need for moral gaze to expand to include the environment (ecocentric ethics) OR remain on humans (anthropocentric ethics), but consider the harms caused by adverse environmental effects

- https://www.nature.com/articles/d41586-022-03050-7?error=cookies_not_supported&code=3e4d4a57-54e0-405d-bbf9-61d3bcf9aa2b&utm_medium=Social&utm_campaign=nature&utm_source=Twitter#Echobox=1666213670-1
- https://www.theatlantic.com/health/archive/2018/08/machine-learning-dermatology-skin-color/567619/

In fact, we have a duty to expand our moral gaze…

- In evaluating the risks of research, focus is primarily on those risks related to participants (in digital science, this would be around, e.g data governance issues). However, when calculating the potential benefits, we expand their purview to include non-participants, including those from both present day as well as future generations. The focus on risks to participants is understandable given that history's research-related harms have directly affected research participants. Nonetheless, it stands to reason that if present-day and future generation non-participants matter when calculating the potential benefits of research, then present-day and future generation non-participants should also matter when calculating the risks and harms associated with research. To not do so gives rise to a risk-benefit calculation – and research conduct – that is one-sided, misguided, and does not properly respect the rights, safety and welfare of non-participants and future generations.
- *Jeffrey d'Souza and myself, forthcoming*

Research ethics framework

Emanuel et al (2008)	Modified research ethics framework (additions)
Social value: research must have reasonable potential to benefit participants, community, and/or society. Adverse effects must be minimised.	**Social value**: Adverse effects that are explicitly associated with the environment need to be considered.
Respect for participants; community partnerships: respecting all of those affected by the research (participants and community)	**Respect for persons, communities, and environment**: Respect for environment means being attentive to the adverse environmental impacts of using digital tech during research and taking steps to reduce them.
Fair participant selection: participants selected in a way that is fair, allows generation of reliable/valid data, minimises harm; communities involved in the research process and receive benefits.	**Justice:** fair collection, storage, use, linkage, and sharing of data, as well as attention to equity and benefit sharing of research outcomes. Furthermore, consideration to environmental justice issues associated with the manufacture, use and disposal of digital tools used during research process.
Favourable risk/benefit ratio: determined by those affected by partaking in the research and/or affected by the research outcomes.	**Favourable risk/benefit ratio**: also includes also those affected by the manufacture of digital products used during the research process, and the subsequent disposal of digital research products and e-waste.

Implementation of framework in practice

For researchers and research ethics committees	For research policymakers
• Where data are stored? • Differential storage of data (long and short latency times) to reduce energy costs where possible. • Algorithms optimised for environmental considerations. Considerations of obsoleteness. • See Lannelongue (2021) for more in-depth guidelines • Lannelongue L, Grealey J, Bateman A, Inouye M. Ten simple rules to make your computing more environmentally sustainable. *PLoS computational biology* 2021;17(9):e1009324-e	• Not *solely* relying on the increasing efficiency of digital technologies to reduce the adverse environmental impacts. Put constraints in place. • Constraining the level of resources provided to researchers. • Resources could be shared more equally with research proposals that use methodologies with lower environmental costs (e.g., research addressing social/political/economic determinants (which likely have bigger impact on outcomes).

Interviews with UK digital health researchers

- Researchers wanted to take responsibility through 'collective responsibility'
- Exceptions (appealing to worse problems; energy hungry algorithms needed)
- Struggled to reconcile perceived responsibilities in practice – data practices under institutional control
- Response-able (Haraway; Johnson and Michaelis, 2013).
- Though – co-alignment was reflected upon
- Calls for regulation (…..we're regulated anyway; we need to be told what to do)
- Compliance-based approaches are limited/can be problematic – 'responsibilisation of the individual' (Rose, 1999)
- 'Better rules' or alternative approaches (funding streams etc) may work better (Jamieson, 2015).

-Samuel (submitted) *Researchers' views on their responsibilities towards the environmental sustainability of their practices: a case study of data-intensive UK health research*
-Samuel (minor revisions). BMCethics

Limitations/considerations

- Should researchers have responsibility? Can they? [ethics]
- Bottom up / top down are both important to enact change [sociology]
- Will regulations lead to compliance-based approaches?
- How to address tensions between other priorities e.g., data governance [also SJ vs env impacts]

Thank you

Dr Gabrielle Samuel
Gabrielle.Samuel@kcl.ac.uk
@gabriellesamue1