Machine Learning

Ethics and AI/ML for Social Good

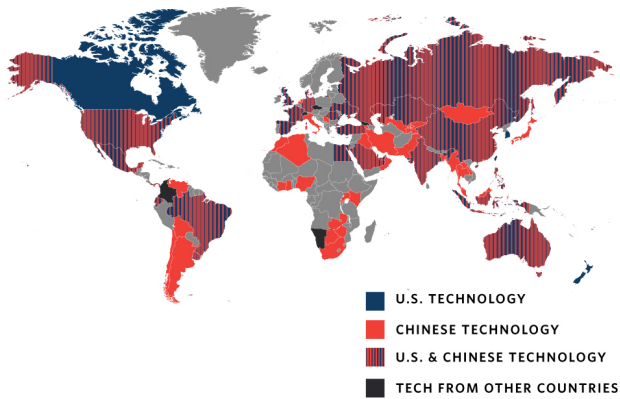
Kia Nazarpour

Slaughterbots

The Global Expansion of AI Surveillance

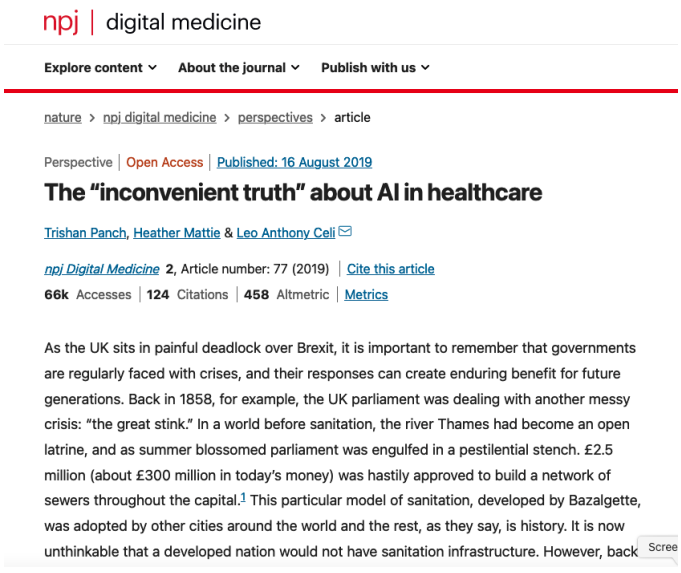
MAP 1

AI Surveillance Technology Origin



Algorithmic bias in healthcare exacerbates social inequities

The “inconvenient truth” about AI in healthcare



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The “inconvenient truth” about AI in healthcare

Trishan Panch, Heather Mattie & Leo Anthony Celi ✉

npj Digital Medicine **2**, Article number: 77 (2019) | Cite this article

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As the UK sits in painful deadlock over Brexit, it is important to remember that governments are regularly faced with crises, and their responses can create enduring benefit for future generations. Back in 1858, for example, the UK parliament was dealing with another messy crisis: “the great stink.” In a world before sanitation, the river Thames had become an open latrine, and as summer blossomed parliament was engulfed in a pestilential stench. £2.5 million (about £300 million in today’s money) was hastily approved to build a network of sewers throughout the capital.[1] This particular model of sanitation, developed by Bazalgette, was adopted by other cities around the world and the rest, as they say, is history. It is now unthinkable that a developed nation would not have sanitation infrastructure. However, back

Scree

A case

- You have a medical problem, and there are two decision support tools available to your doctor
- One is a simple and interpretable method, but its overall AUROC is 0.85
- The other is a deep neural network which no-one understands fully how it works, but its overall AUROC is 0.95
- Which would you like your doctor to use, and why?

Slide Credit: Chris Williams, IAML 2020

AI and Social Good

Research for People

Research with People

Research by People

Inspired by Hannah Jones, UoE, 2022

Questions to ask about your technology

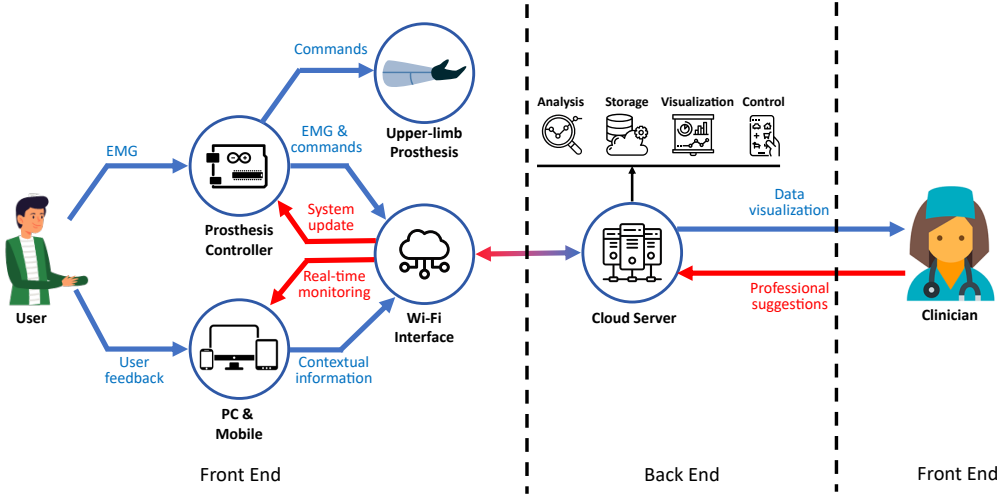
Ethics is not a checklist. It is an ongoing conversation, and requires you to question possible outcomes.

- Who are the stakeholders? This includes anyone who funds, develops, or uses your technology, and anyone it is used upon.
- Who benefits from the technology? How?
- Who could be harmed by the technology? How?

These are questions you must ask yourself and all of the stakeholders

Slide Credit: Adam Lopez, NLU+ lecture 12, 2020

Prosthetics Research Beyond the Laboratory



Wu H, Dyson M, Nazarpour K. (2022) Internet of Things for beyond-the-laboratory prosthetics research. Phil.Trans.R.Soc.A380: 20210005. PDF

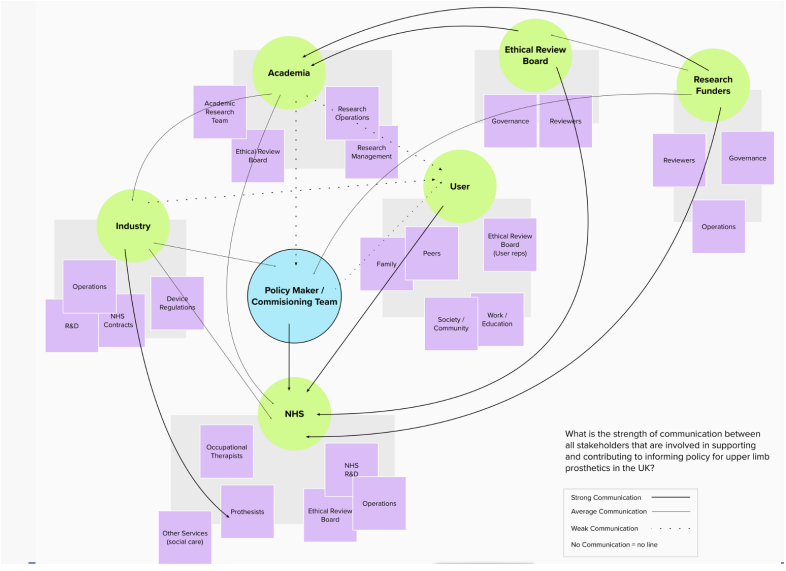
Example stakeholder views

Service User:
I constantly have to find ways around.

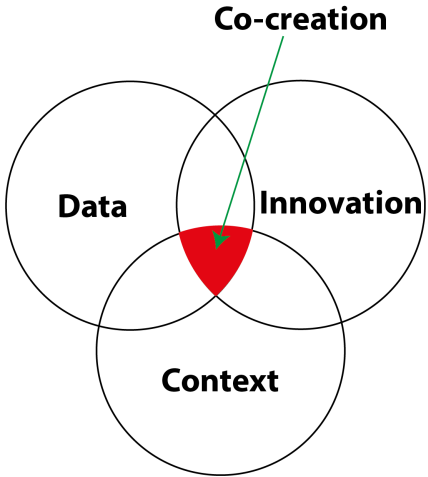
Academic:
... device usage does not happen in a vacuum – it happens in a context.

Clinician:
The assessment does not take other forms of information into account...

Real life problems are complex!



A collaborative working model



What is research ethics?

- Why is research ethics needed?
- Who is involved in research ethics?
- What does Research Ethics enable research teams to do?
- Who benefits from the technology? How?
- Who could be harmed by the technology? How?

What does research ethics aim to achieve?

Research ethics govern the **standards of conduct** for scientific researchers.

Conduct: Design, implementation, and dissemination

Adherence to ethical principles to protect the **dignity, rights and welfare** of research participants (and researchers).

Origins of Research Ethics

1947: Nuremburg Code

1964: Declaration of Helsinki
World Medical Association
(revised seven times)

WORLD
MEDICAL
ASSOCIATION

Most recent version: October 2013. Grown from the original 11 to 37 paragraphs in 2013.

Sections of the Declaration of Helsinki (2013)

Risks, Burdens and Benefits

Informed Consent

Research Ethics Committees

What is the foundation that feeds into these sections?

Ethical Principles for Medical Research, Declaration of Helsinki, World Medical Association. Involving Human Subjects

Guiding Principles of Research Ethics

Autonomy
Respect decision making capabilities of autonomous persons

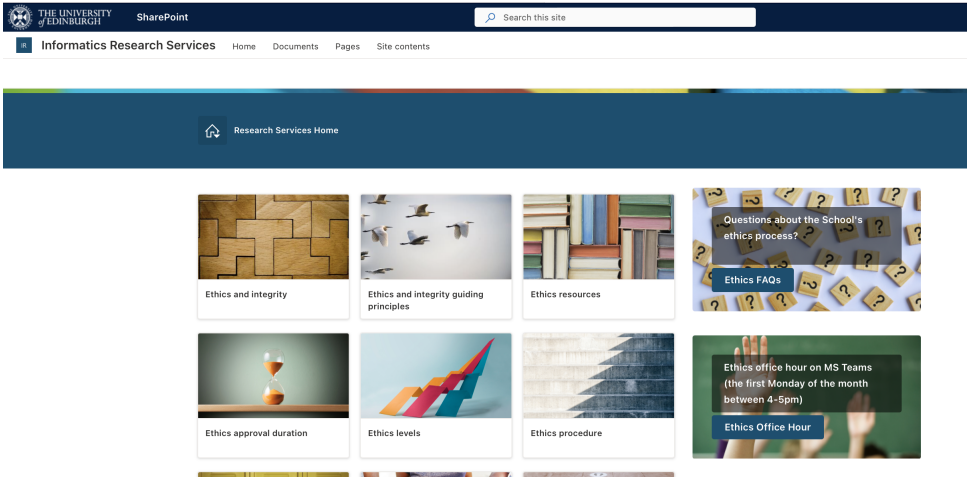
Non-Maleficence
Obligation to avoid harm

Beneficence
Obligation to provide benefits and to balance benefits against risk

Justice
Obligation of fairness in the distribution of benefits and risk

Ethics for Bioengineers, Monique Frize, 2011

Ethics in School of Informatics

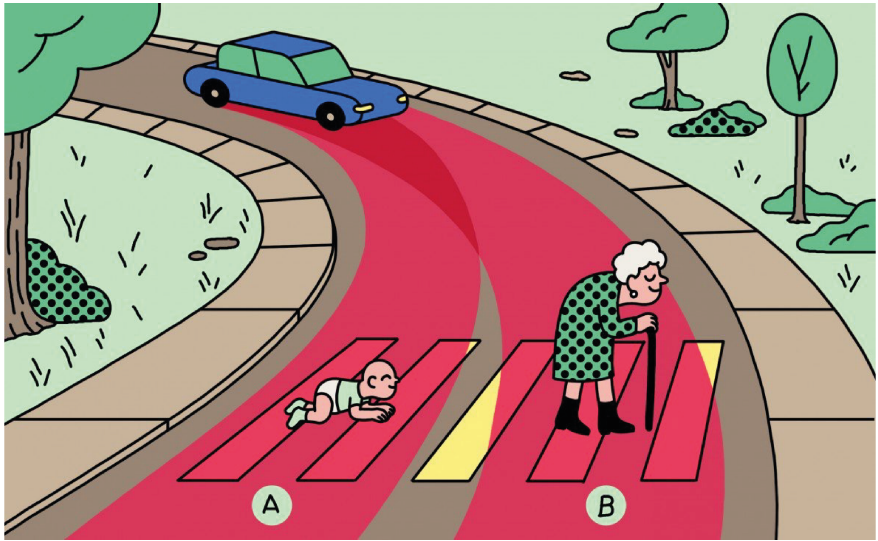


https://uoe.sharepoint.com/sites/inf-researchservices/SitePages/Ethics.aspx

Links for further reading

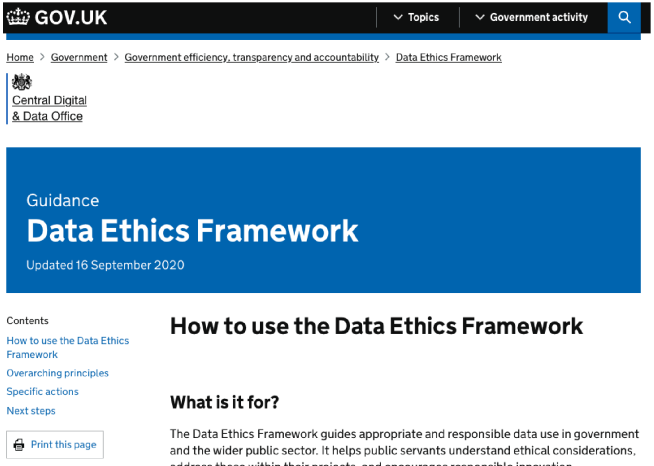
- AI Audit
- European Commission's Ethics guidelines for trustworthy AI
- Fairness and Machine Learning: Limitations and opportunities

AI and Ethics!

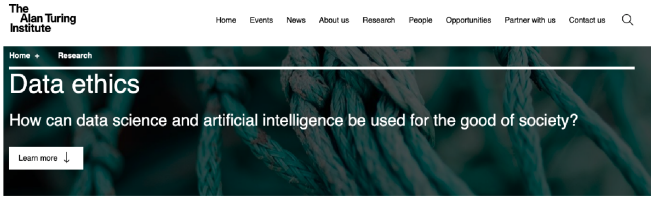


K. Hao. MIT Technology Review. October, 2018.

UK Gov - Data Ethics Framework



Alan Turing Institute - Data Ethics



Data science and AI technologies for everyone's benefit

The Alan Turing Institute is committed to using data science and AI technologies for everyone's benefit, and to protect society against these technologies' unintended consequences.

This page provides an overview of the wide range of initiatives in the field of data ethics taking place at the Institute.

Data Ethics Group

Made up of a range of researchers specialising in ethics, social science, law, policymaking, and big data and algorithms, the Data Ethics Group works in collaboration with the broader data science community, facilitates public dialogue on relevant topics, and supports the Turing's workshops and public events relating to data ethics.