

# Machine Learning

## Lecture 27: Ethics and AI/ML for Social Good

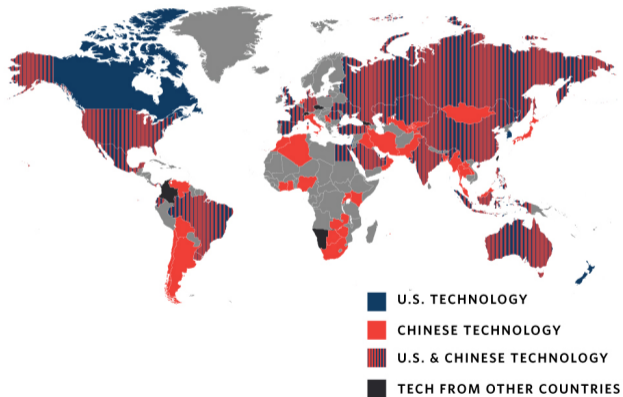
Kia Nazarpour

# 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](#)

**66k** Accesses | **124** Citations | **458** Altmetric | [Metrics](#)

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.<sup>1</sup> 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?

# AI and Social Good

Research **for** People

Research **with** People

Research **by** People

# Questions to ask about your technology

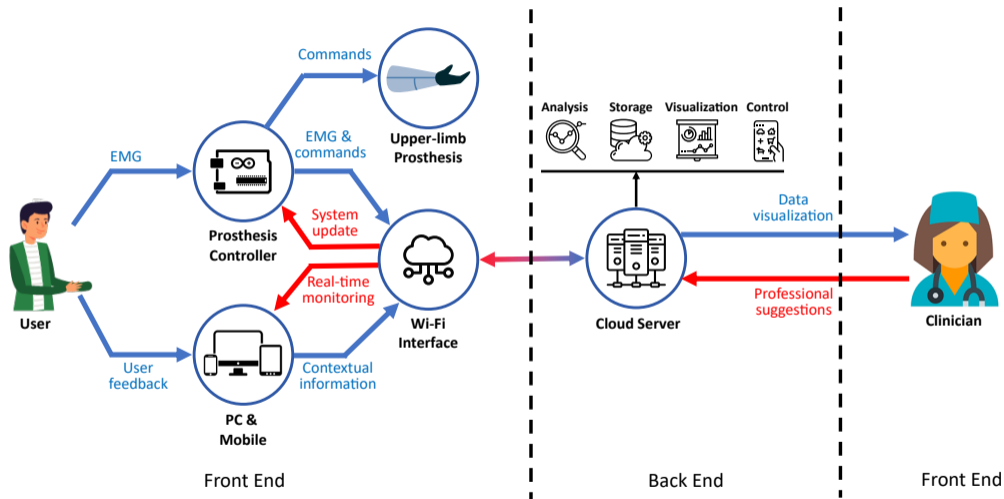
Ethics is not a checklist. It is an ongoing conversation, and requires you to question possible outcomes.

- 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*



# Prosthetics Research Beyond the Laboratory



## Example stakeholder views

### Service User:

I constantly have to find ways around.

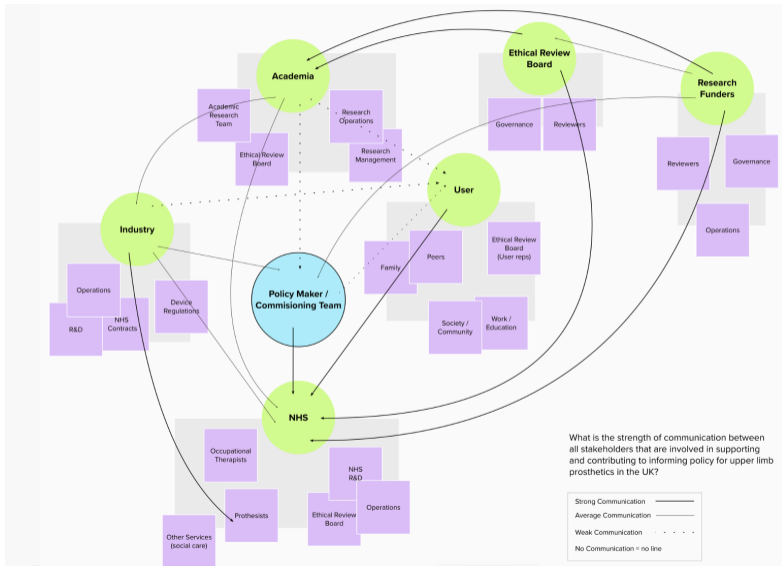
### Academic:

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

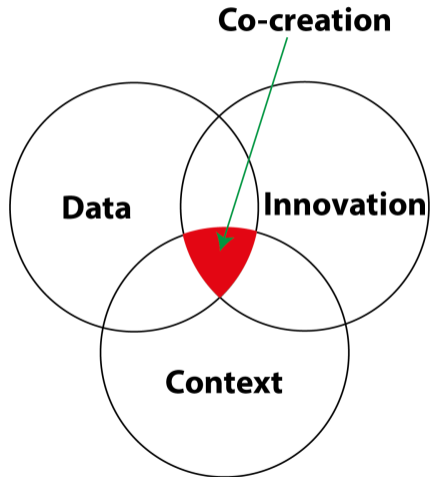
### Clinician:

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?



# 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 in School of Informatics



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## School of Informatics Intranet INFWEB

InfWeb home

Research

Ethics and integrity

Introduction to research ethics and the Informatics ethics process

Ethics and COVID-19

Ethics and integrity guiding principles

Ethics and the UK GDPR

Ethics procedure

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## Ethics and integrity

Summary of the School ethics pages, including the School's ethics and integrity guiding principles, ethics procedure and ethics committee membership.

For a brief overview of ethics and the Informatics ethics process, see the video on our introduction tab.

[Introduction to research ethics and the Informatics ethics process](#)

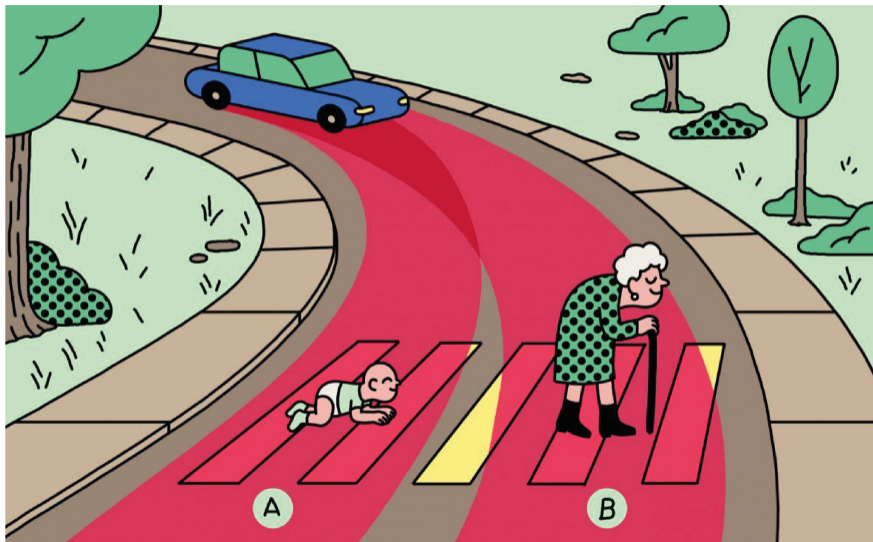
The Informatics ethics procedure is in place to ensure that all research conducted in the School abides by the required ethical standards. To this end, the

<https://web.inf.ed.ac.uk/infweb/research/ethics-and-integrity/ethics-procedure>

## Links for further reading

- [AI Audit](#)
- [European Commission's Ethics guidelines for trustworthy AI](#)
- [Fairness and Machine Learning: Limitations and opportunities](#)

# AI and Ethics!



# UK Gov - Data Ethics Framework



Guidance

## Data Ethics Framework

Updated 16 September 2020

Contents

[How to use the Data Ethics Framework](#)

[Overarching principles](#)

[Specific actions](#)

[Next steps](#)



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## How to use the Data Ethics Framework

### What is it for?

The Data Ethics Framework guides appropriate and responsible data use in government and the wider public sector. It helps public servants understand ethical considerations, address these within their projects, and encourages responsible innovation.

# Alan Turing Institute - Data Ethics

## Data ethics

How can data science and artificial intelligence be used for the good of society?

[Learn more](#) ↓

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### 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.

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### 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.