Responsible Research and Innovation

Ensuring Data Science and AI Contribute to the Social Good

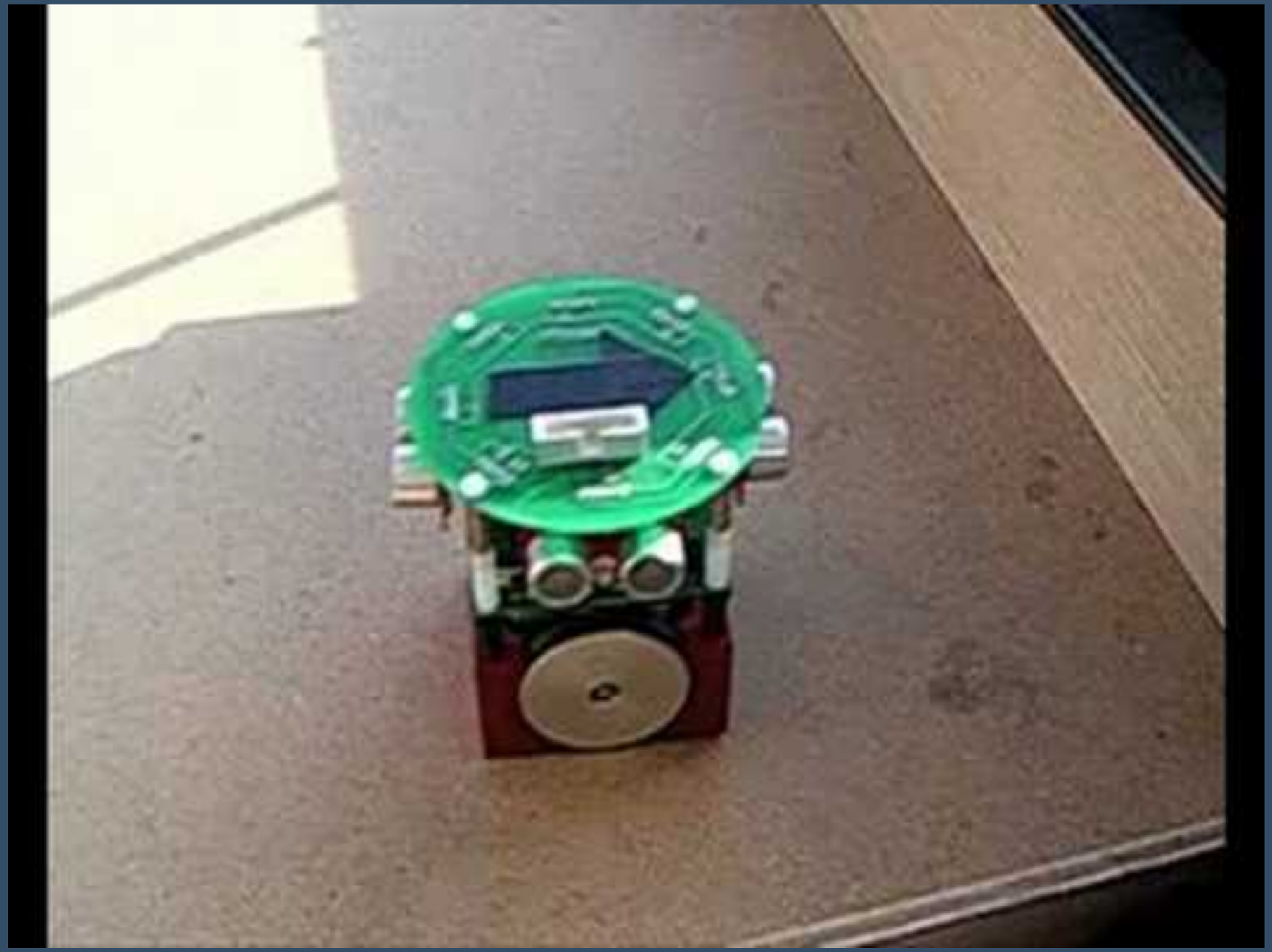
The Alan Turing Institute

About Me

Dr Christopher Burr

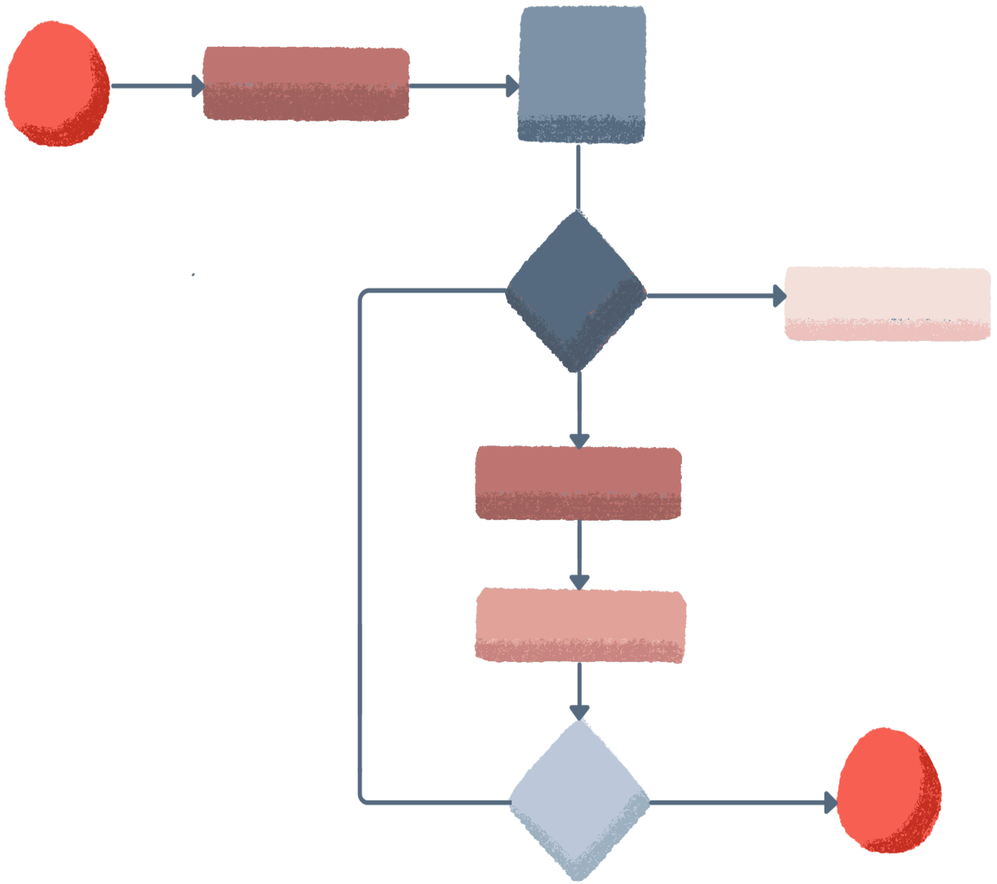
I’m an Ethics Fellow in the Public Policy Programme, and a Philosopher of Cognitive Science and AI.

I’m also a lover of technology, rock climber, and an (annoyingly) proud dad!



About You!

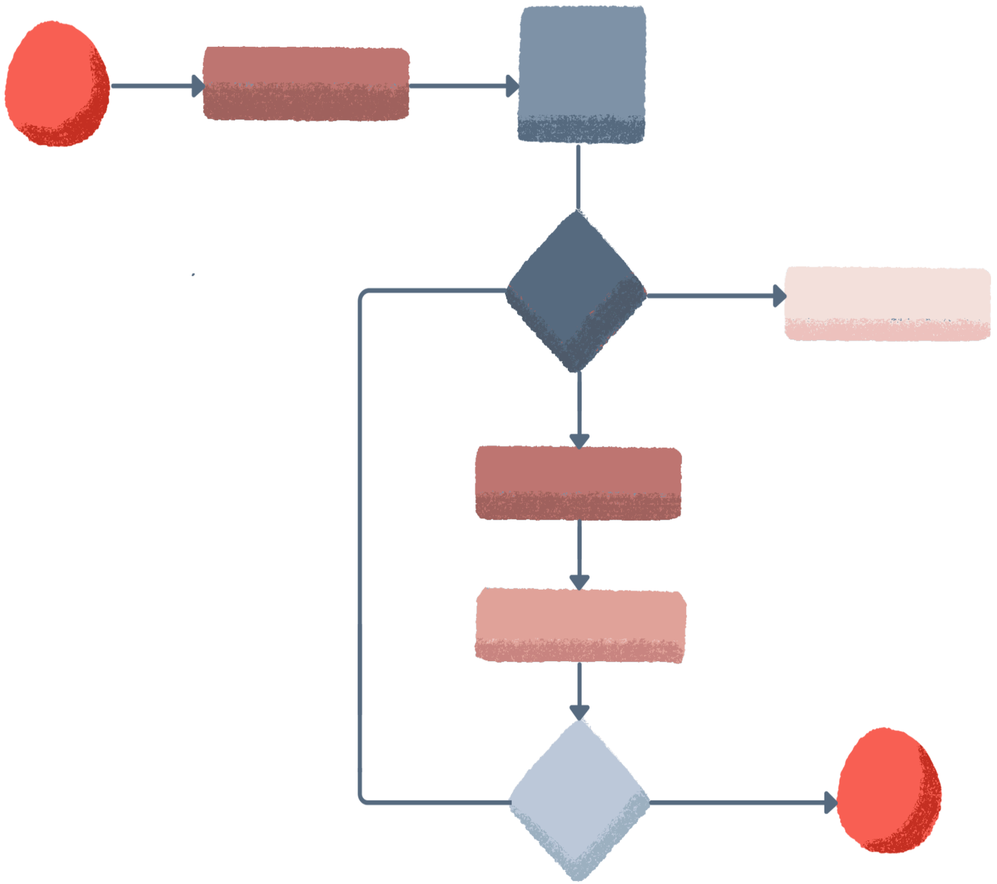
About the Course!



Learning Objectives

About this Course

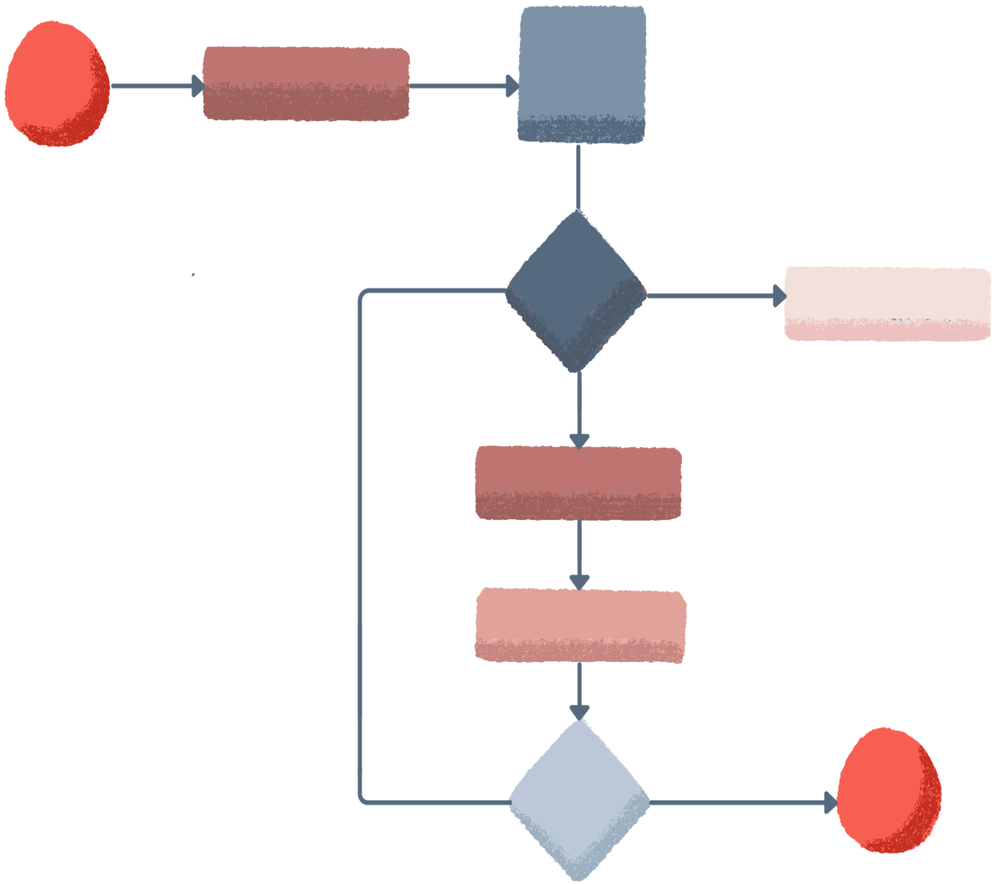
- Understand what is meant by the term ‘responsible research and innovation’, including the motivation and historical context for its increasing relevance.
- Identify and evaluate the ethical issues associated with the key stages of a typical data science or AI project lifecycle: (project) design, (model) development, (system) deployment.
- Explore practical tools and mechanisms for operationalising the concept of ‘responsibility’ within the context of data science and AI research and innovation.
- Gain an appreciation of shared goals and values across scientific disciplines and research domains through dialogue with other participants.



Schedule

About this Course

1. What is Responsible Research & Innovation?
2. Responsible Data Science and AI
3. The Project Lifecycle (Part 1)
    - Guest Lecture (Professor Sabina Leonelli)
4. The Project Lifecycle (Part 2)
5. Responsible Communication

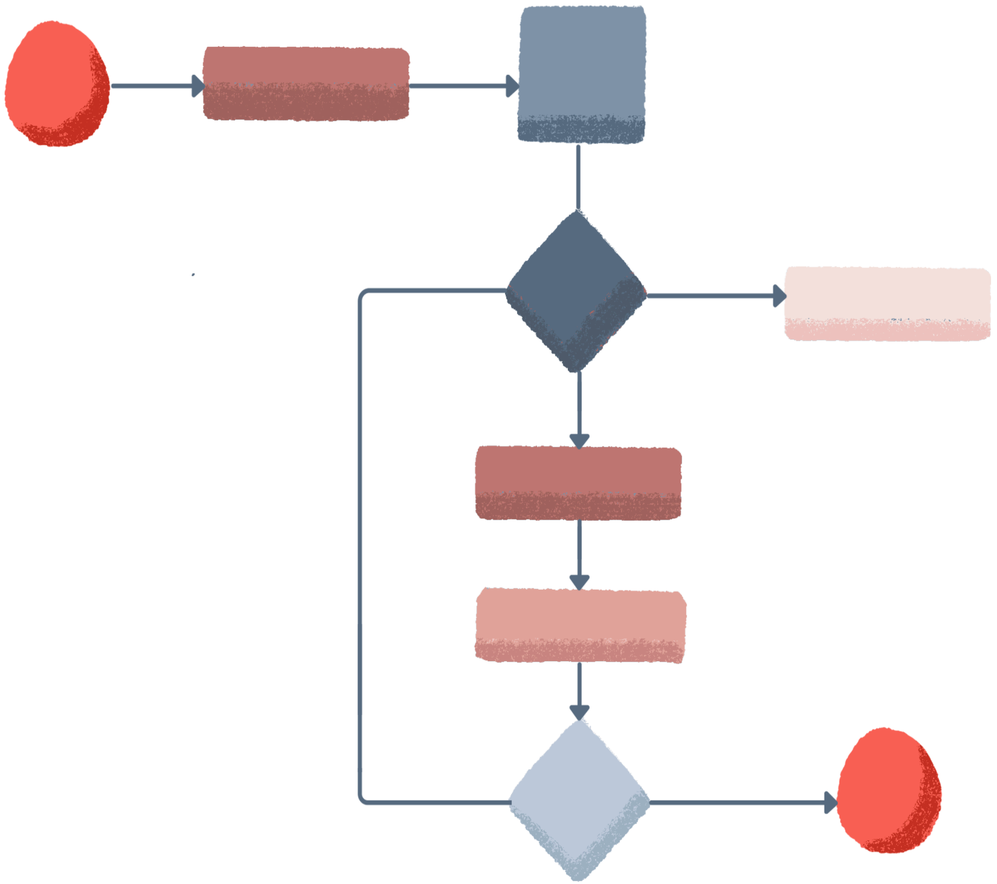


Requirements

About this Course

The following will be used throughout this course:

- Zoom (Plenary Sessions and Breakout Rooms)
- HackMD (Collaborative Note-Taking)
- Mural (Interactive Whiteboard)
- Slack (Communication)
- GitHub (Raising Issues and Contributing)



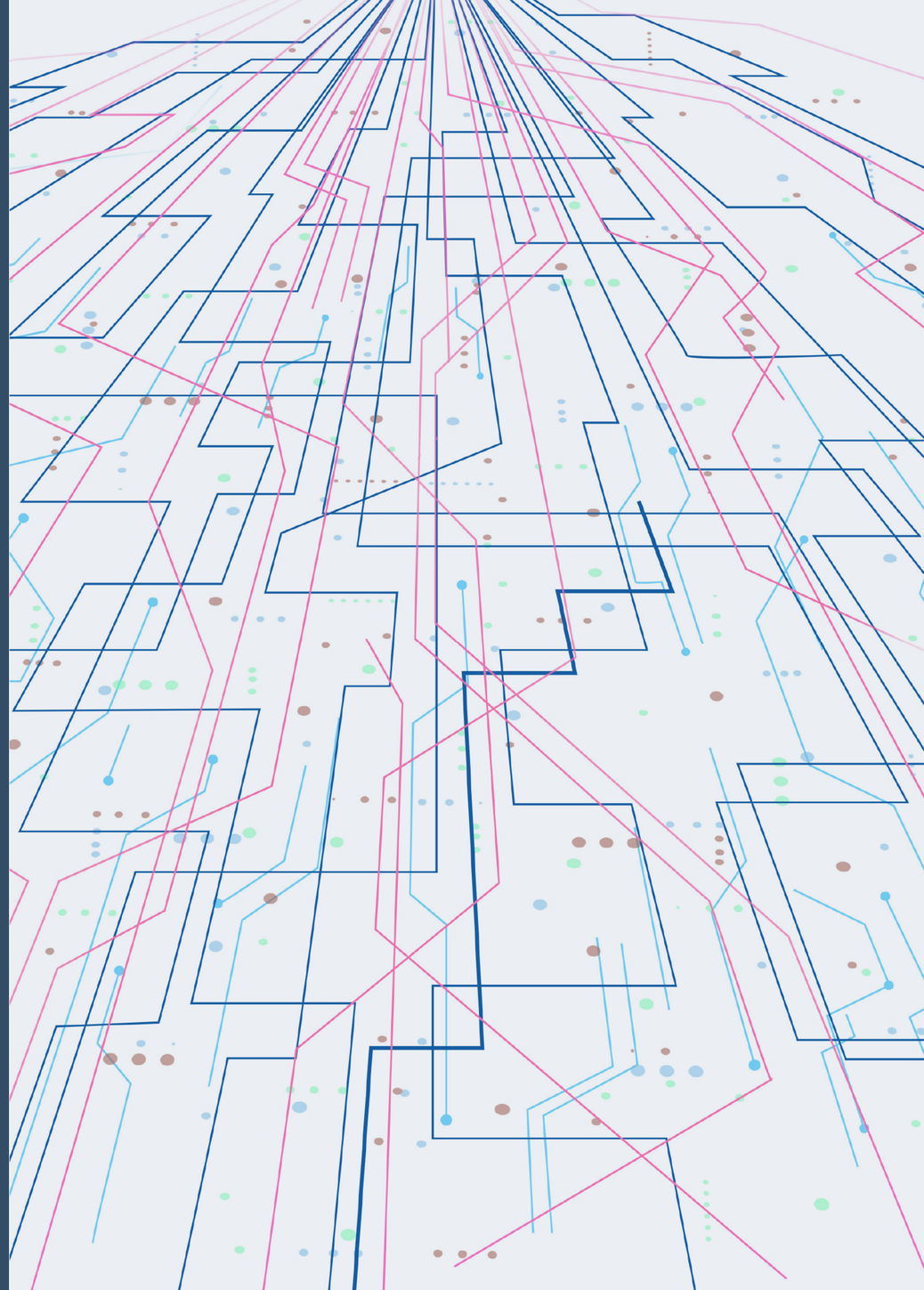
Guidelines

About this Course

- Remain on mute when you are not talking.
- Raise hand if you want to talk during plenary.
- Try to keep your video on in breakout groups.
- Take part using whatever medium you are comfortable using.
- **Disagree** but don’t be **disagreeable**!

Introduction

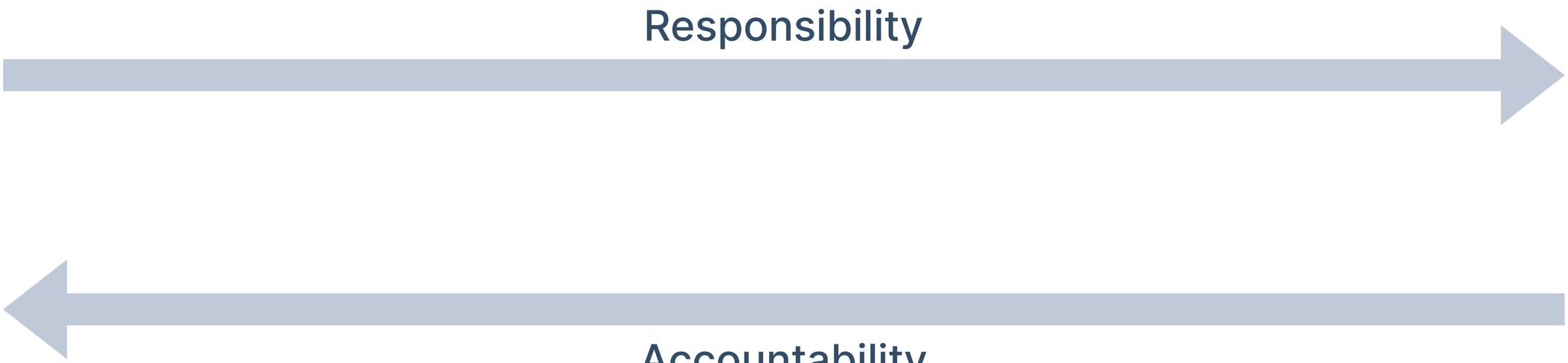
What is Responsible Research and Innovation?

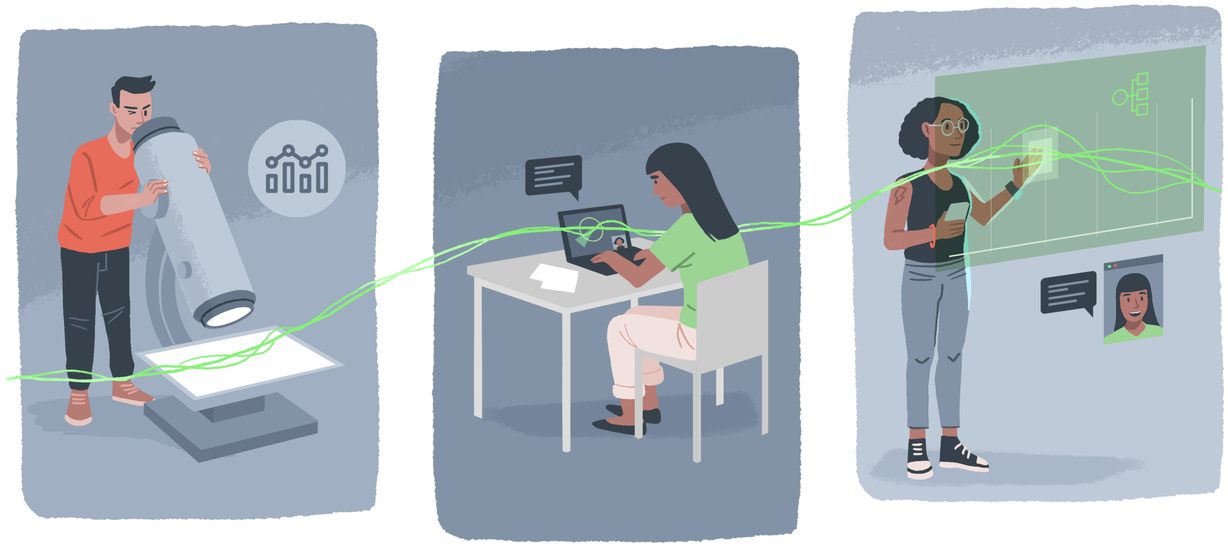


What is RRI?

Different Approaches

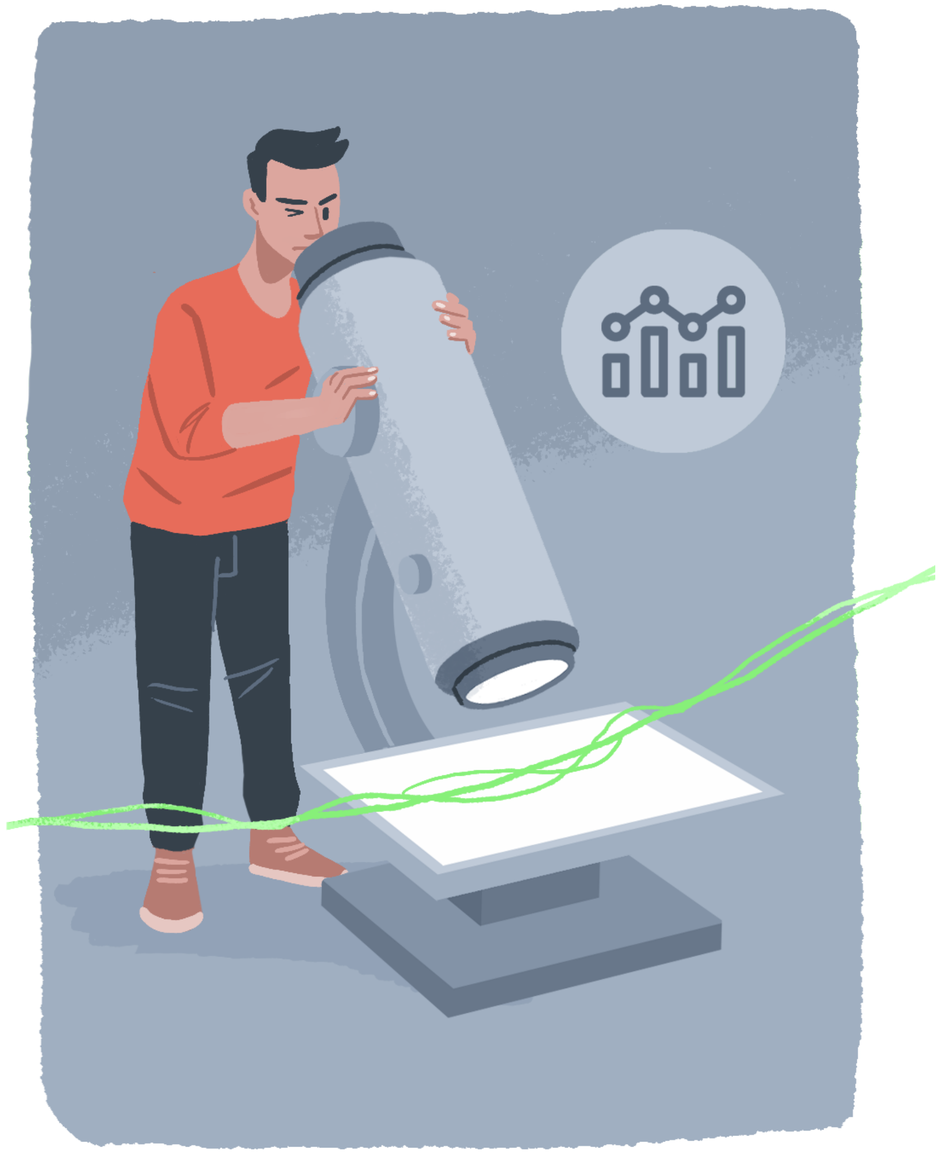
- European Commission Framework Programmes for Research and Technological Development
- UKRI’s EPSRC (AREA) Framework
  - Anticipate
  - Reflect
  - Engage
  - Act


Responsibility
Accountability



“Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).”

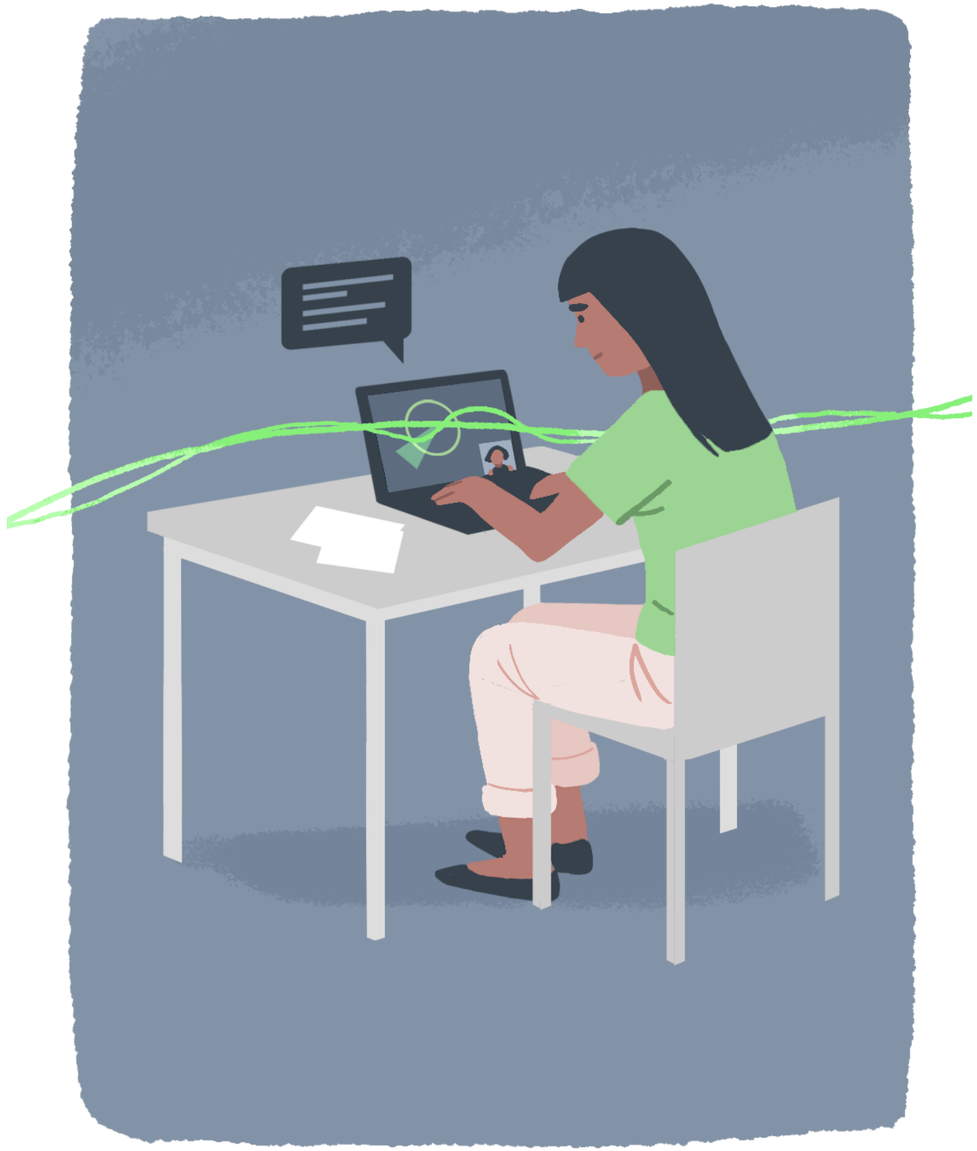
(Von Schomberg, 2011)



Defining ‘Responsibility’

What is Responsibility

“...transparent, interactive process by which societal actors and innovators become mutually responsive to each other”



Defining ‘Responsibility’

What is Responsibility

“...with a view on the (ethical) acceptability, sustainability and societal desirability of the innovation process”

Defining ‘Responsibility’

What is Responsibility

“...proper embedding of scientific and technological advances in our society”

Tuskegee Syphilis Experiment

- Conducted between 1932 and 1972
- Observation of untreated syphilis on a group of nearly 400 African American males
- Study continued without funding and without providing sufficient care or information to the participants

Human Genome Project

- To identify all of our ~20,500 genes and determine the sequences of nearly 3 billion chemical base pairs
- Founded the ELSI program to oversee ethical, legal, and social consequences
- Governance comprised only scientific administrators

Cambridge Analytica

- Misuse of research produced at Cambridge University
- Creation of predictive model that could segment social media users for targeted advertising
- Use of poorly regulated platform (i.e., Facebook) to interfere in national elections and governance

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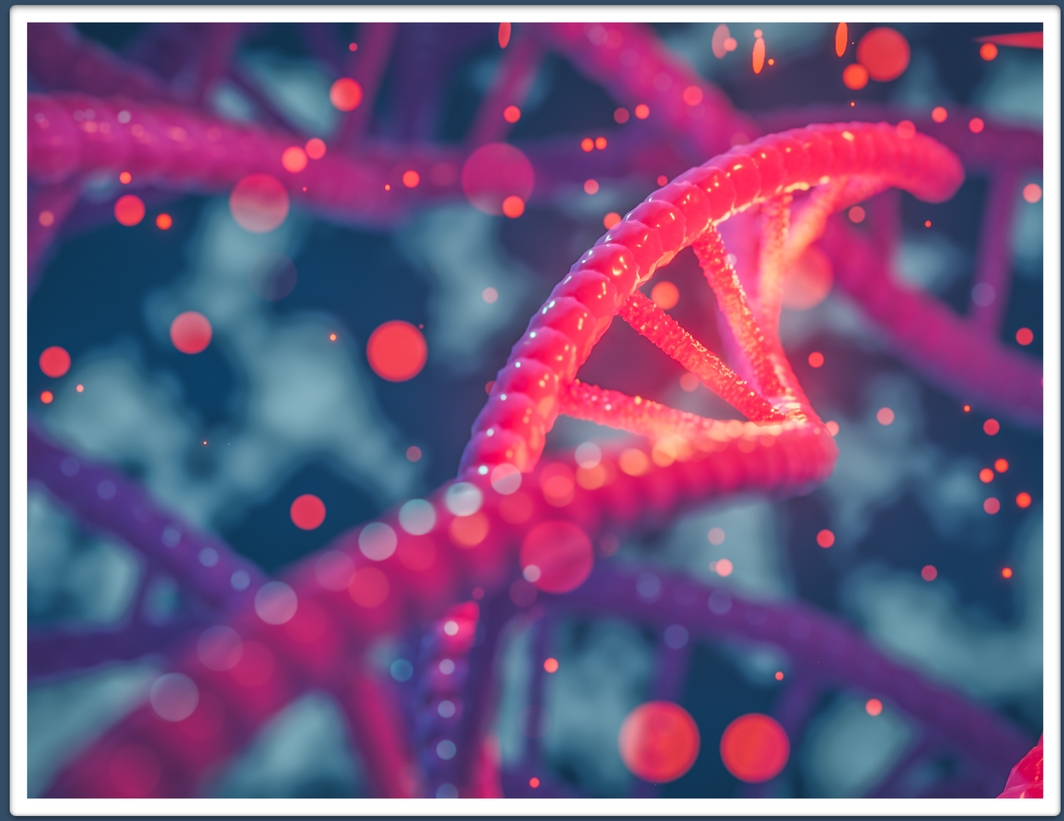

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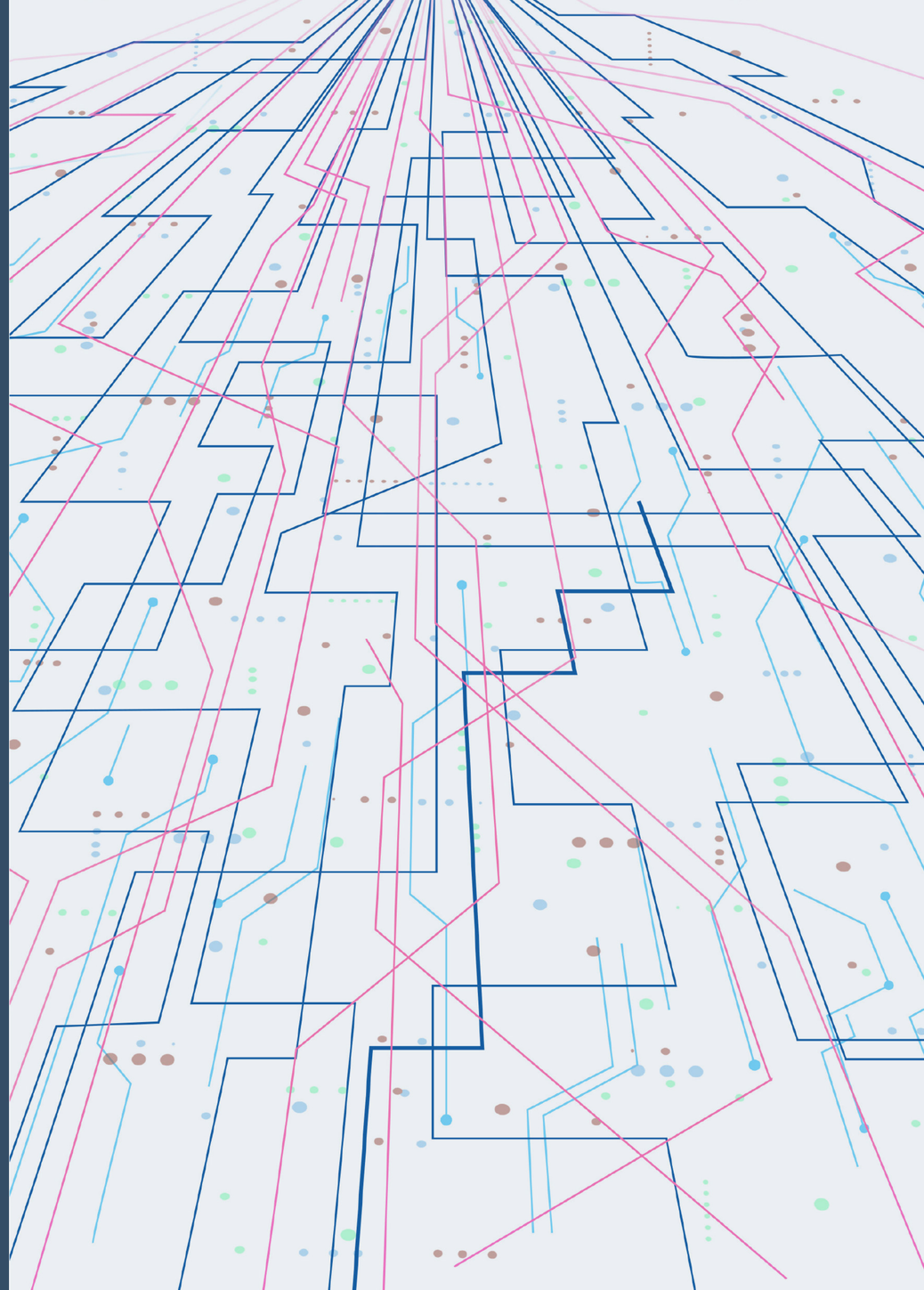
Activity 1

Exploring Historical Case Studies



Activity 1

Exploring Historical Case Studies

💡 Questions for Reflection

1. Which properties of these case studies do you think make them examples of unethical or (ir)responsible research and innovation?
2. Are any of these properties necessary or sufficient for categorising a research or innovation project as unethical?
3. Can you think of any other famous cases of (ir)responsible research or innovation?
4. What about cases of responsible research and innovation?
5. What properties differentiate the (ir)responsible cases from the responsible cases of research or innovation?

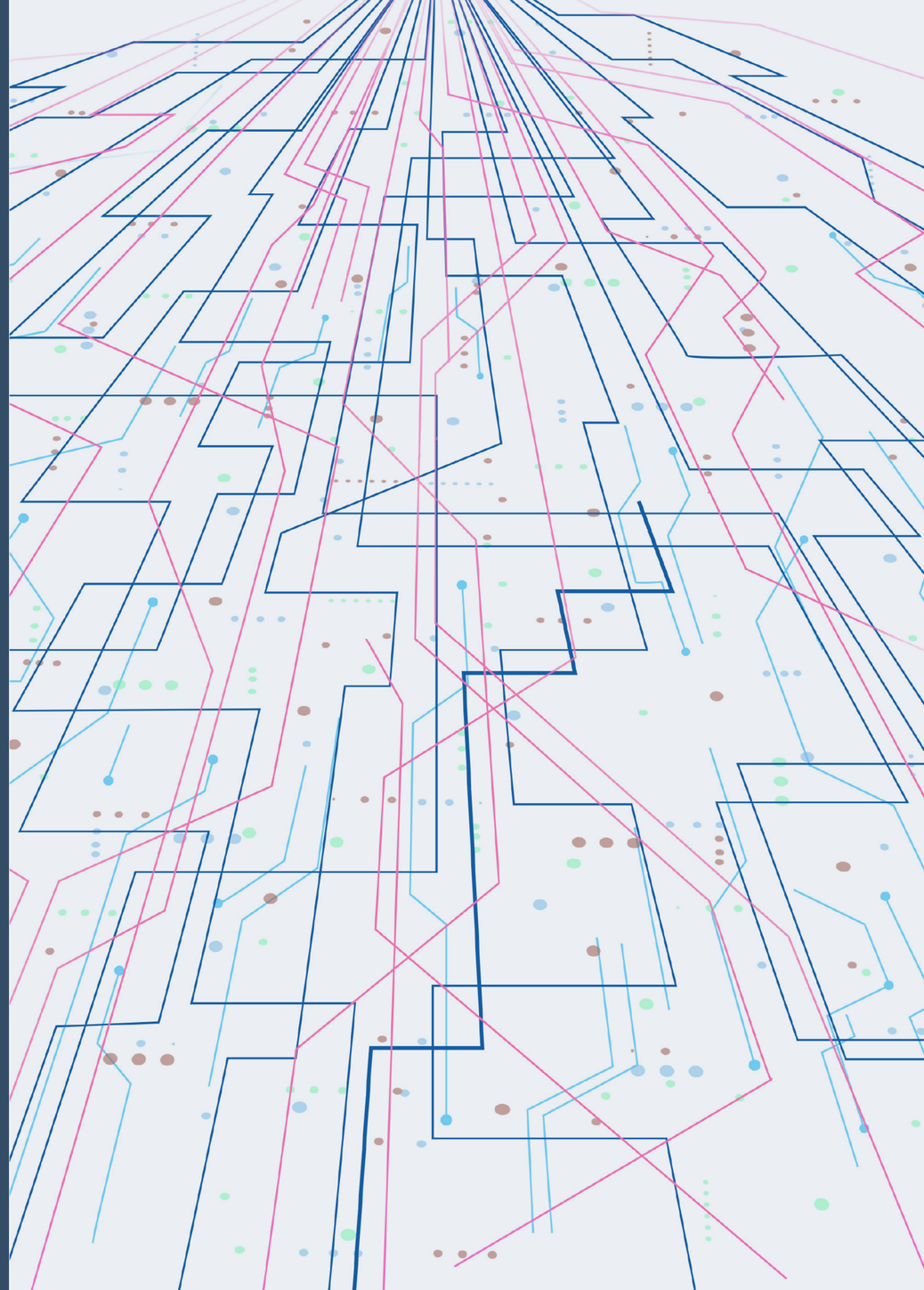
Breakout Groups

Plenary

Lunch

Introduction

Science, Technology and Society

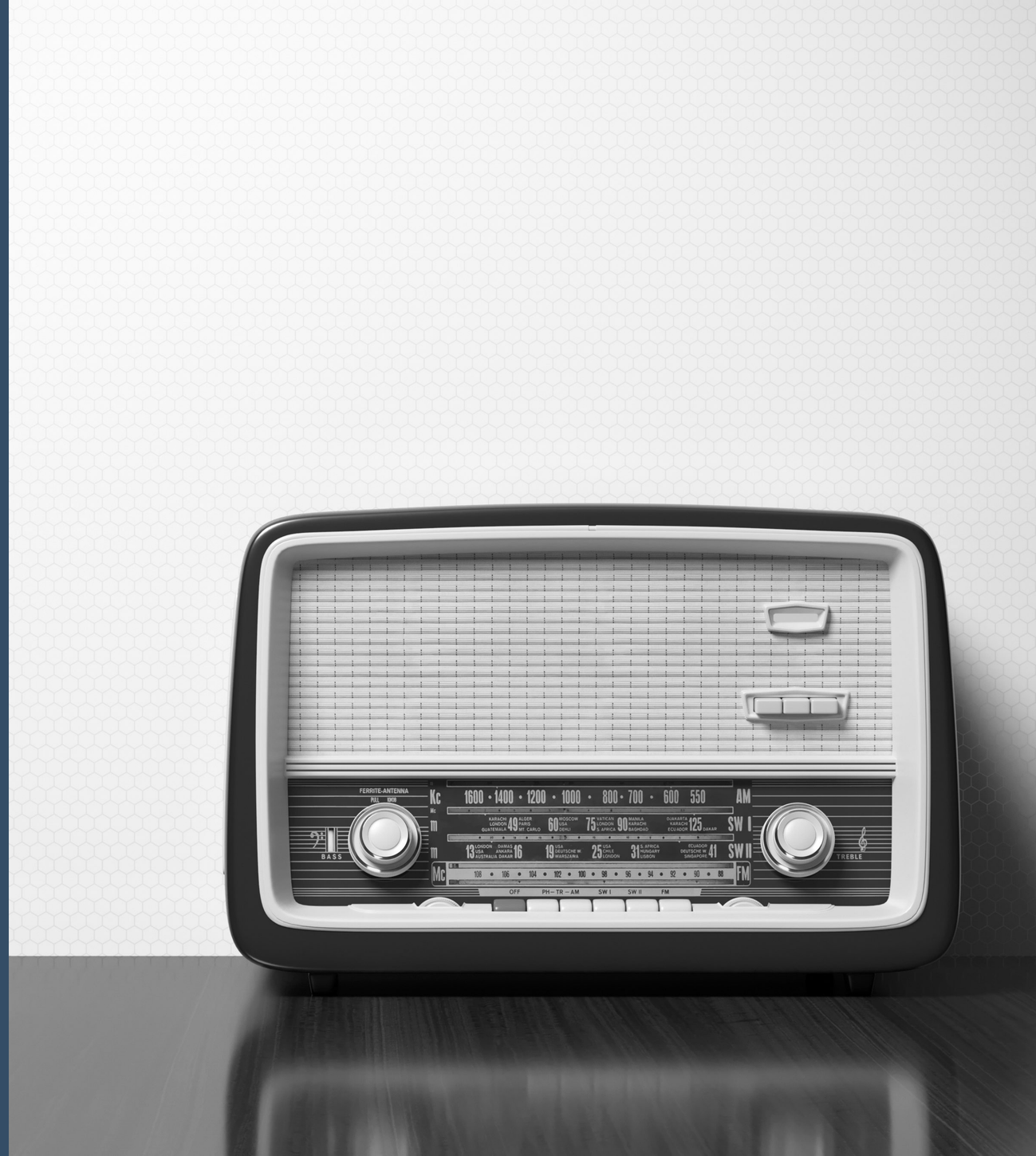


Uncertainty & Responsibility

Anticipating Consequences

In 1945, Michael Polanyi—a chemist and sociologist of science—and Bertrand Russell—a philosopher and logician—were speaking on a radio programme about the practical implications of the famous formula, $E = mc^2$

They were asked whether the formula had any practical applications for society, but neither could provide an answer.



Uncertainty & Responsibility

Anticipating Consequences

Three months later the Manhattan project dropped the first of their three atomic bombs!

Uncertainty & Responsibility

Anticipating Consequences

Polanyi, in his essay, ‘The Republic of Science’, used this story to suggest that the practical and societal outcomes of pure scientific research are often unforeseen and unintended.

Does this mean scientists cannot be held accountable or take responsibility for their research?

Locating Responsibility

Organised Irresponsibility

“We have a system of organised irresponsibility: Nobody really is responsible for those consequences…”

– Ulrich Beck

Moral Blame and Praise

The Careless CEO

Imagine a CEO of a large manufacturing company is approached by one of her scientific advisors and informed that a project that she has proposed will require an environmental impact assessment before it can proceed.

The CEO dismisses this and orders that the project continue without the assessment. Furthermore, she callously proclaims that she does not care what the environmental consequences of the project may be. All she is interested in is making as much profit as possible.

As it turns out, the project ends up causing vast amounts of pollution that cause irreparable harm to the nearby flora and fauna, and also affects the health of a community living downstream of the manufacturing plant. The CEO is, rightfully, held accountable, both morally and legally, and is prosecuted when her dismissal of the impact assessment is uncovered.

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Should the CEO be praised for her actions?

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Taking Responsibility

Practical Mechanisms

- Risk and Impact Assessments
- Inclusive and Deliberative Stakeholder Participation

Analysing Risk

Impact Assessments

Responsible research and innovation is an approach that **anticipates and assesses** potential implications and societal expectations with regard to research and innovation, with the aim to foster the design of inclusive and sustainable research and innovation. (European Commission, 2014)

A variety of impact assessments:

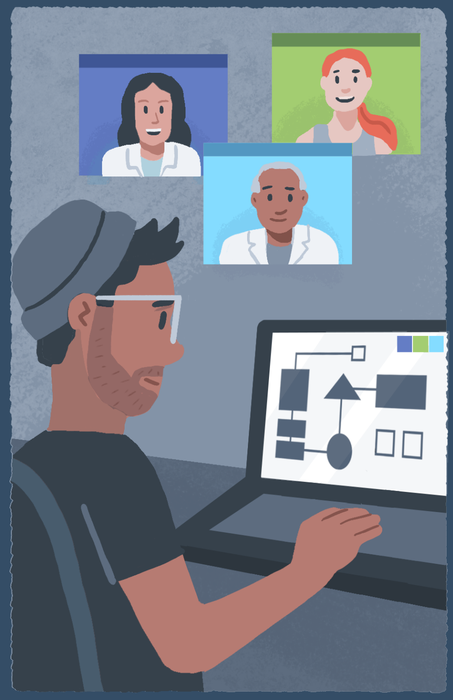
- Safety Impact Assessment
- Environmental Impact Assessment
- Data Protection and Privacy Assessment
- Equality Impact Assessments
- Human Rights Impact Assessment
- Stakeholder Impact Assessment

Identifying Harms & Benefits

Stakeholder Participation

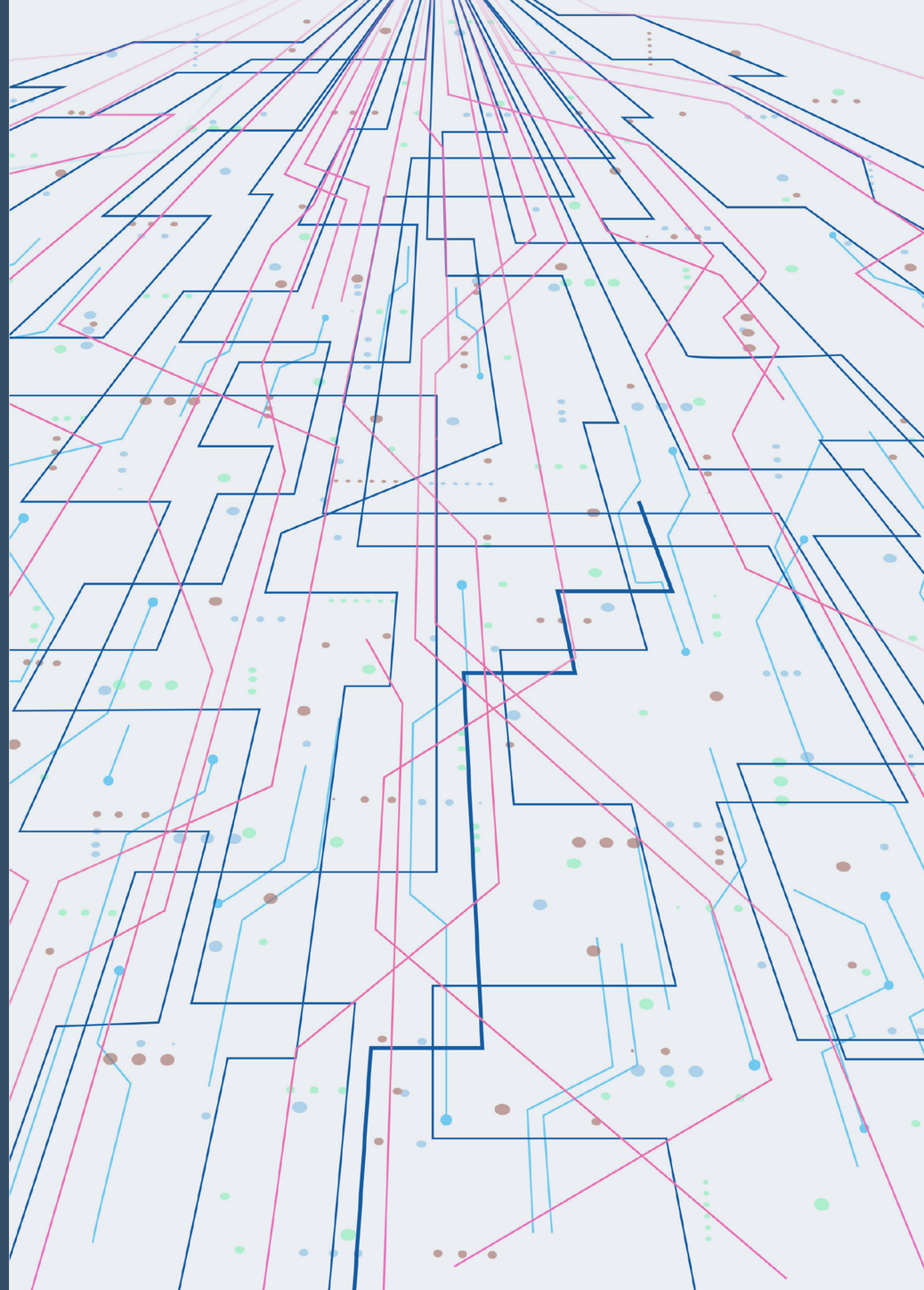
It is unlikely that only **one person** will be involved/affected by a data science or AI project. It is far more common for many individuals— whether members of the team or end users—to have some role within or responsibility for the project.

Engaging data subjects and stakeholders is vital for identifying and understanding the full suite of harms and benefits associated with a project.



Activity 2

Ethical Reflection and Deliberation



Breakout Groups

Plenary

Thank you!

See you tomorrow!

Dr Christopher Burr
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@chrisdburr