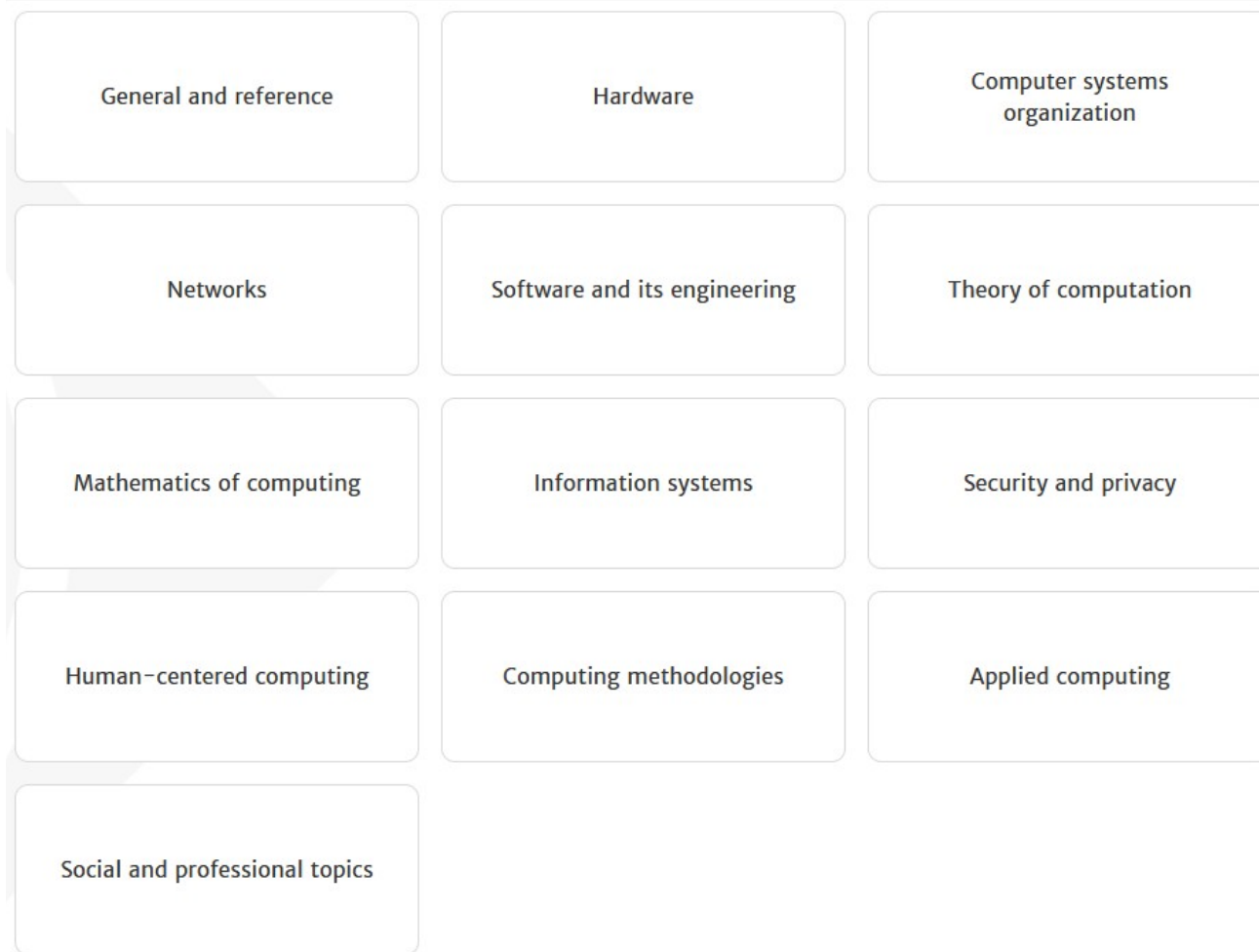# Responsible digital developments in research and education: where do we start?

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10/07/2025

About you

General and reference	Hardware	Computer systems organization
Networks	Software and its engineering	Theory of computation
Mathematics of computing	Information systems	Security and privacy
Human-centered computing	Computing methodologies	Applied computing
Social and professional topics		

ACM nomenclature of computer science domains

You say responsible digital developments

ACM SIGCOMM 2022 Joint Workshops on "Technologies, Applications, and Uses of a Responsible Internet" and "Building Greener Internet" (TAURIN + BGI)

IETF WG: Getting Ready for Energy-Efficient Networking (green)

M. Cook, "The Social Responsibility of Game AI," in IEEE Conference on Games (CoG), 2021.

Ethical statement for reviewers and paper's authors

Computer Networks Special Issue on Value-driven Sustainable and Ethical Networking

B. J. Grosz, et al., "Embedded EthiCS: integrating ethics across CS education," Communications of the ACM, vol. 62, no. 8, pp. 54-61, 2019.

Embedded EthiCS@Harvard, Harvard University

Yet another ethics thing

What it is exactly about?

Not only about the ethical concerns raised by AI

Not only about revisiting research codes of conduct

Not only about regulations and laws

Need for actionable resources and tools

→ for research and for education

Engagement scale

The Ethics in Mathematics Project

Welcome to the Ethics in Mathematics Project (EiMP). Since 2016, we have been re-searching and teaching responsible behaviour and ethical awareness to mathematicians. This project was set up to make available teaching resources to mathematicians around the world who wish to replicate this sort of teaching. But our project extends beyond this. We are producing a series of discussion papers on topic relating to Ethics in Mathematics (EiM); the EiM Discussion paper series. We have also hosted a series of conferences on these issues, the first of which (EiM1) took place in 2018 and the second (EiM2) in 2019.

This project was initially set up by Dr Maurice Chiodo (a Research Associate at the Centre for the Study of Existential Risk, University of Cambridge) and Dr Piers Bursill-Hall (a lecturer in the history of mathematics). The project has, with the assistance of numerous others, built up a knowledge base and developed academic resources for the understanding and teaching of Ethics in Mathematics. Maurice has travelled extensively to give seminars, colloquia and workshops at other universities, to raise awareness and help them set up their own teaching programmes for Ethics in Mathematics.

Additionally, in Cambridge the Cambridge University Ethics in Mathematics Society (CUEiMS) is a student society set up in 2016 to host events related to EiM, including

Initiative started in 2016 at Cambridge by Chiodo and Bursill-Hall

https://www.ethics-in-mathematics.com/

Time one wishes to invest thinking about their responsibilities towards the developments to which they contribute

absence of any sense of responsibility (the lowest level - level 0)

awareness of ethical challenges (level 1)

readiness for actions (level 2)

active advocacy for engagement (highest level - level 3)

The role of narratives

Illustrative case of research in networking

(Hyper) performance

High speed
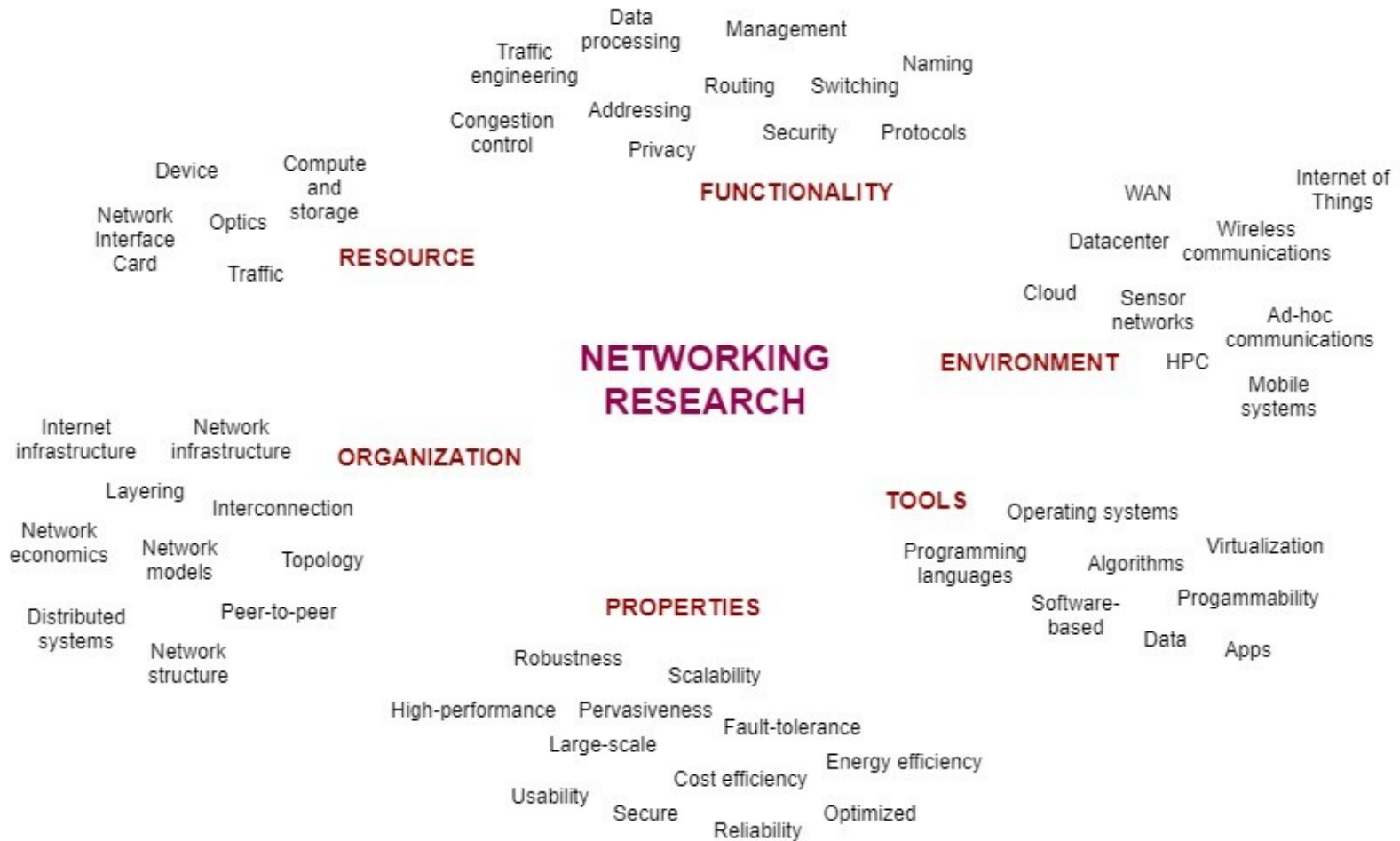
High precision

High bandwidth

High rate

Optimisation

Supply / demand matching

Measurement

Everything is dataset

What about yours?

Listening to networking researchers

D. Tuncer and M. Bruyere, "Responsible developments and networking research: a reflection beyond a paper ethical statement," Pespective and Opinion Report, arXiv, arXiv:2402.00442, February 2024.

And with a different perspective?

Networking research and …

time
Global temporal uniformity (instantaneous delivery) or accentuation of diverging temporal perception across regions / populations ?

space
The physical space (infrastructure for different geographical settings), geopolitical space, administrative boundaries

interaction
Model of ubiquitous connectivity leading to major digital shift in public services, education, banking, industry with societal implications

automation
In a manner that is human-focused rather than quantitative performance-driven

the environment
Rebound effects
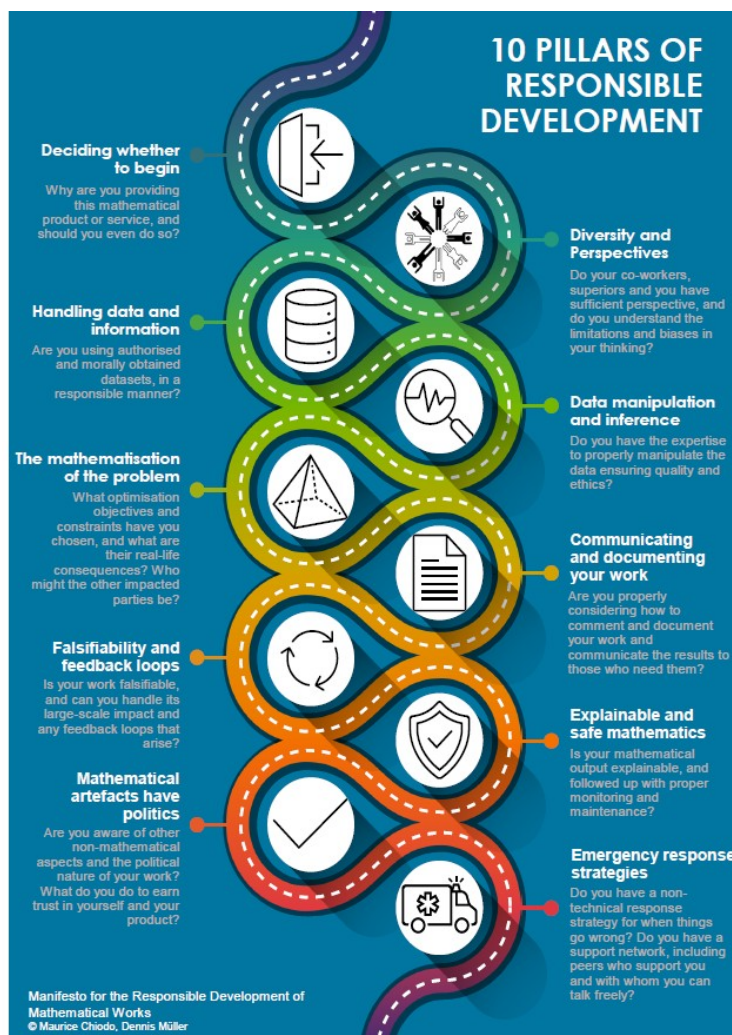
Beyond a research in silos

THE SUSTAINABLE DEVELOPMENT GOALS

To reconsider the *as-a-service* or *in-support-of* model of multidisciplinary research

Towards an equivalent of translational medicine?

Pillars of responsible data science

Maurice Chiodo and Dennis Mueller, "Manifesto for the Responsible Development of Mathematical Works – A Tool for Practitioners and for Management," Technical report, Section 7.3.2, arXiv, 2306.09131, 2023.

Exercise

Guide students towards thinking about the implications of their (data) project

Organised in the form of an innovation canvas

Be able to describe project objectives, constraints and main hypotheses

Identify impact of the project developments and results

Identify benefits and opportunities for the project

Identify key capacity for the realisation of the project

D. Tuncer, "Data Science & Digitalisation in the Energy Sector," MSc Sustainable Energy Futures, Energy Futures Lab, Imperial College London, UK, 2021.

Cafe philo for computer science

Started during the COVID-19 lockdown

Space for discussion in informal settings

Participants with mixed backgrounds in CS

Challenge of setting a clearly identified end goal

M. Bruyere, F. Richoux, D. Tuncer, and M. van der Wal, "A cafe-philo for computer science: motives, experience and next steps", Abstract, Undone Computer Science, February 2024.

Online workshop organisation

"Embedding ethical, social and environmental considerations in research practice", April 2024

To brainstorm on the reason, goals and challenges of starting these initiatives and developing relevant **tools**

Four different initiatives discussed focusing on different aspects of a research activity

Raising awareness on ethical, social and environmental issues in the research practice

Carrying out a research project

Disseminating research results and scientific knowledge

Some observations

Feeling of illegitimacy: we are not *experts* in these questions and hence may not feel relevant to talk about them

To develop strategies based on a target audience, factoring in both educational and cultural backgrounds

For instance when targeting students, the rational is not in terms of short timescales, the horizon for transformation is in the longer term

Need to develop tools that others can adapt to their own domain rather than to make these tools generic and abstract

Make things easier for others to make things better

Need to proceed step by step

Some observations (con't)

Currently little reward or even money to support these activities

Underlying perception that caring about these ethical issues is an additional effort rather than as an integral part of what researchers should do

And at the institutional level?

Many *ad-hoc* initiatives with no institutional support

First participation (without funding) in the 2025 Internet Governance Forum through a 45min round table

Ethical networking: sustainability and accountability

Three main issues discussed

Alignment of networking discipline with ethical principles

Making sure that emerging technologies have positive impacts

Role of IGF in promoting sustainable and responsible Internet governance

What can we try?

New workshop format

       based on a flipped classroom model where attendees work together
       on the co-construction of propositions, questions and / or suggestions

A manifesto model adapted per discipline

A comprehensive review of existing initiatives

Where do you stand?

        This is none of my business

        I did not get the point

        That resonates with me!

In any case, thank you for listening!

Questions?

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