INSTITUT FÜR HÖHERE STUDIEN
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Science, Technology and Social Transformation

Social Responsibility: Business, Research and Innovation 3

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Technical/admin issues

Learning outcomes and delivery

Learning outcomes:
- Have a general awareness of what the relationship of technology and society
- Understand the concept of
  - CSR (Corporate Social Responsibility)
  - pCSR (Political Corporate Social Responsibility)
  - STS (Science and Technology studies)
  - SCOT (The social construction of technology)
  - Sociotechnical imaginaries
  - RRI (Responsible Research and Innovation)
- The relationship of these concepts to the philosophy of science and sociology
- Understand the concept and methodology of social phenomenology
- Have sufficient knowledge of different conceptualizations of technology, of automobility, of research and innovation
- Have practice in theoretical argumentation, understanding complex sociotechnical problems and conceptualizations.

Completion

Students will have to (a) do a presentation; (b) write one academic blog post and (c) a final course paper.

➢ **Presentation:** should reflect on a current theme analyzed from a critical responsibility point of view (15 mins);

➢ **Academic blog:** should reflect some current sociotechnical challenge, addressed via learnings acquired in the course (250-500 words);

➢ **Final paper:** will address a specific question within the realm of STS and analyze it according to general academic practice, based on literature review and secondary research (but not independent primary research) (2500-3000 words).

Responsible Innovation

Session 1: Society, responsibility & technology

10:00-11:30

Introduction, general concept, theme, administrative issues

11:45:13:15

Business, Responsibility & Innovation

13:45-15:15

What is CSR/pCSR?

15:15:16:45

What is STS (Society and Technology Studies)?

Session 2: Responsibility & Technology: the case of automobility

10:00-11:30 *Recap*

11:50-13:20 *Sociotechnical systems*

13:20-14:00 Lunch

14:00-15:30 *Automobility*

15:45-16:45 *Automobility violence*

16:45-17:00 *Wrap-up*

Session 3: The future of technology and society

9:00-10:15 Recap

10:15-11:20 Break

11:30-13:00 *What is responsible research and innovation?*

13:20-14:50 *What would a post-car world look like?*

15:10-16:40

The trouble of artificial intelligence

16:40-17:00 *Closing & summary*

1. Recap

Business, Responsibility & Innovation

○ "[Engineers] are the unacknowledged legislators of the world. By designing and constructing new structures, processes, and products, they are influencing how we live as much as any laws enacted by politicians. Would we ever think it appropriate for legislators to pass laws that could transform our lives without critically reflecting on and assessing those laws? Yet neither engineers nor politicians deliberate seriously on the role of engineering in transforming our world. Instead, they limit themselves to celebratory clichés about economic benefit, national defense, and innovation."

Carl Mitcham: The True Grand Challenge for Engineering: Self-Knowledge

➤ https://issues.org/perspectives-the-true-grand-challenge-for-engineering-self-knowledge/

Engineers as legislators

Go to **www.menti.com** and use the code **4408 2287**

The 17th-century "Quest for Certainty"

○ a timely response to a specific historical challenge-the political, social, and theological chaos embodied in the Thirty Years' War;

○ Cartesian program for philosophy that swept aside the "reasonable" uncertainties and hesitations of 16th-century skeptics in I favor of new, mathematical kinds of "rational" certainty and proof;

○ Build a secure body of human knowledge using "rationally validated" methods.

○ Framing basic theories around ideas whose merits were clear, distinct and certain and using only demonstrable arguments, having the necessity of geometrical proofs.

The (his)story of responsibility
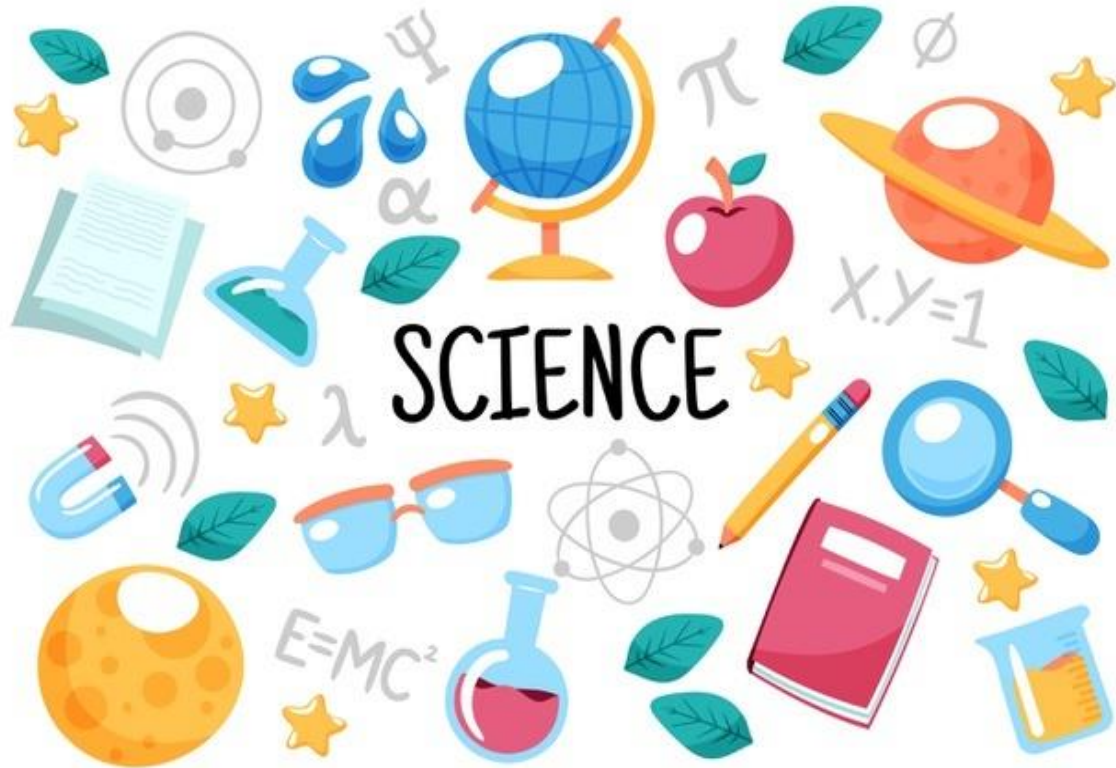
What is science?

Kjetil Rommetveit, Roger Strand, Ragnar Fjelland & Silvio Funtowicz (2013). „What can history teach us about the prospects of a European Research Area?" Ispra: JRC
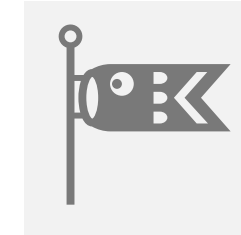
Thirty Years' war	Religious conflicts	Disorder & superstition
Destitution and devastation	Insecurity of knowledge	Witchcarft and 'alternative' knowledge trajectories

- The grand book of the universe written in the language of mathematics.
- To avoid precipitancy and prejudice, and to include judgements nothing more than what presented itself.
- Continual fear and danger of violent death and the life of man solitary, poor, nasty: covenants, without the sword, are but words.

Science as ideology
Science as political hierarchy

Innovation & Responsibility

Key words:

✓ Giving back

✓ Strategic goals

✓ Cradle to cradle

✓ Management of impacts

How is (one) responsible?
- Do no harm
- Anticipate impacts
- Do good business
- Bring better solutions
- ....

➤ Innovation is generally conceived as the basis for a competitive economy: to develop new market segments, improve the quality of their products or reduce the costs of production.

➤ A constant race for novelty and improvement only those that constantly reinvent themselves and their products can win. An innovation's success is, however, measured in terms of its uptake on the market and its generation of economic profit for the owner of the innovation. Societal benefit may arise as positive externalities of innovation but are not per-se decisive for action.

➤ Innovation management in companies is mostly concerned with creating fruitful environments for new ideas and deciding which of these ideas will be pursued further and which are to be discarded.

What is STS?

It deconstructs processes and terminologies of science in order to help understand how science works, both internally and within society at large.

A large body of scholarly work has examined historical, social, technological, and political contexts shaping different modes of scientific inquiry and how scientific knowledge is shaped and circulated in particular places at particular times.

Science and Technology

○ is focused on organizations, networks, and assemblages and approached human and non-human actors. STS considers how technology and society co-produce each other.
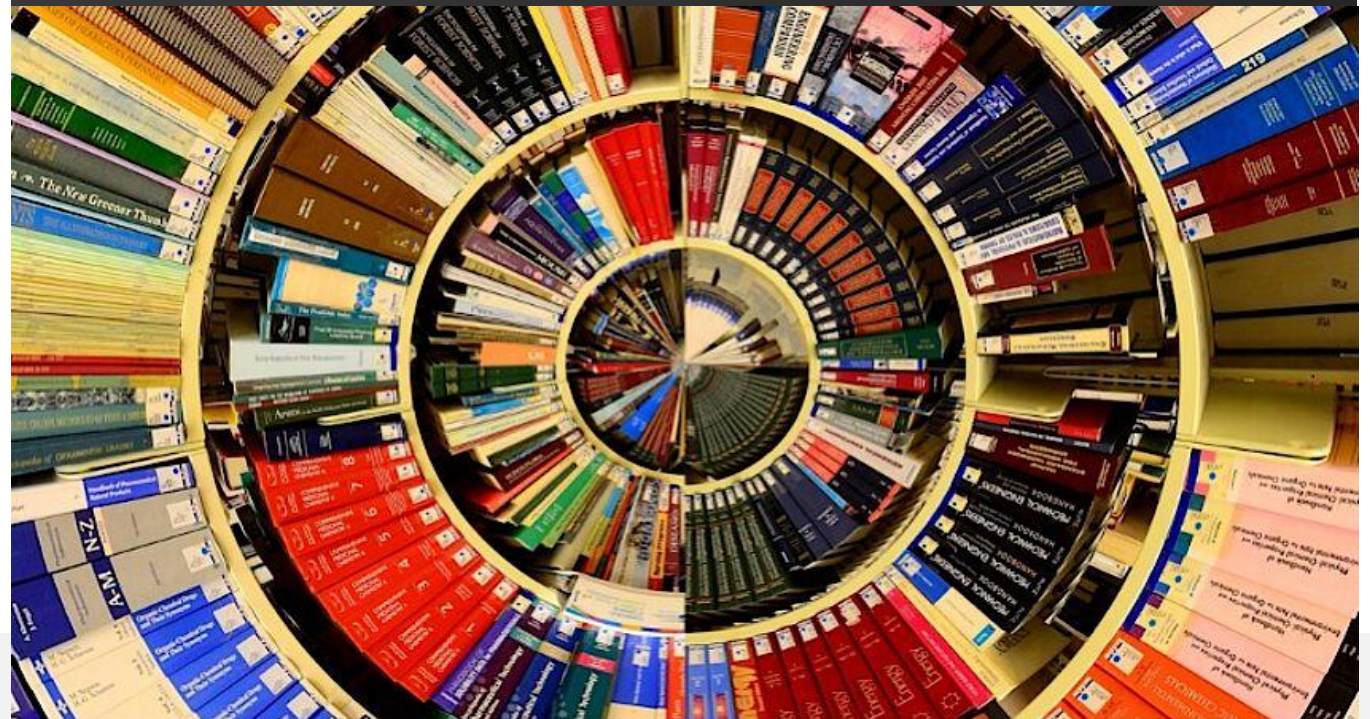
STS on science as politics

Scientific/engineering practices and methods (data collection, sampling, calculating, charting results, and modeling) are **inscription devices**.

➢ They seem stable and graspable (or they stabilize and grasp), but they simultaneously may serve to erase the complex materiality of the reality being studied.

➢ Scientific knowledge is constructed not by individual scientists or by science as such but by specific established practices that are widely accepted and practiced among groups of scientists and institutions.

What is a sociotechnical system?

❖ The term *socio-technical systems* was originally coined by Emery and Trist (1960) to describe systems that involve a complex interaction between humans, machines and the environmental aspects of the work system.

❖ Technology plays an important role in fulfilling societal functions

❖ Socio-technical systems consist of a cluster of elements, including technology, regulation, user practices and markets, cultural meaning, infrastructure, maintenance networks and supply networks

❖ Socio-technical systems are actively created, (re)produced and refined by several social groups, for instance, firms, universities and knowledge institutes, public authorities, public interest groups and users. These social groups have their own vested interests, problem perceptions, values, preferences, strategies and resources (money, knowledge and contacts).
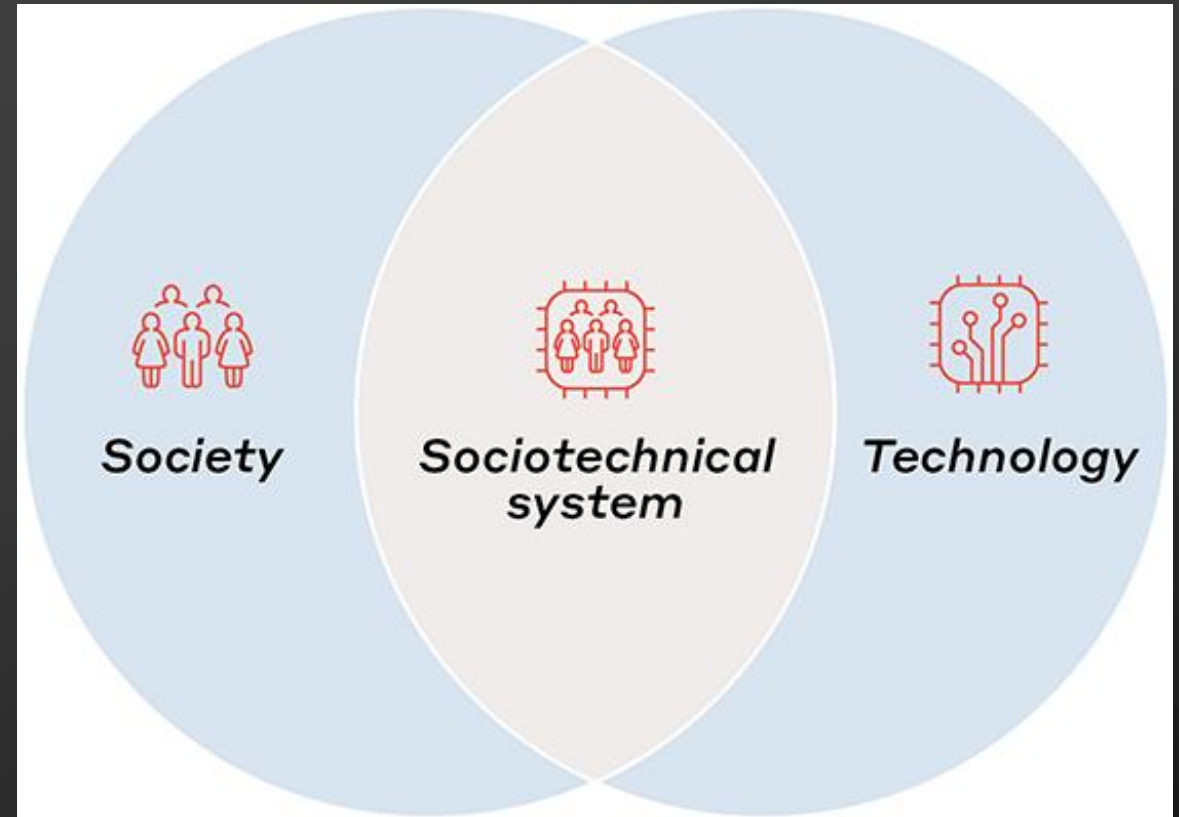
Automobility as sociotechnical system

Regulations and policies
(e.g. traffic rules, parking fees,
emission standards, car tax)

Maintenance and
distribution network
(e.g. repair shops, dealers)

Production system and
industry structure
(e.g. car manufacturers,
suppliers)

Road infrastructure
and traffic system
(e.g. lights, signs)

**Socio-technical system
for land-based road
transportation**

Markets and user practices
(mobility patterns, driver
preferences)

Culture and symbolic
meaning (e.g.
freedom, individuality)

Automobile (artefact)

Fuel infrastructure
(oil companies,
petrol stations)

Automobility

The ill-named thing

John Urry

"A self-organizing autopoietic, nonlinear **system** that spreads world-wide, and includes cars, car-drivers, roads, petroleum supplies and many novel objects, technologies and signs."

Stephen Böhm, et al

"A **regime** shaping and producing *new types of people* consistent with [its] logics."

Katharina Mandersheid

"[A]n **apparatus** of dispersed and decentralized power, which consists of automobile landscapes, discourses, formation governance of specific subjectivities and mobility practices."

Braun & Randell

A political order: a world; one example, constituent element, manifestation, of the political ontology of the late-Anthropocene.

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Multiple forms of violence

Being in automobility

Physical

85 million dead & billions injured that are referred to and analysed as "accidents"
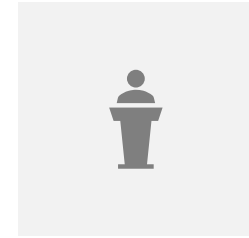
Slow

A violence that occurs gradually and out of sight, of delayed destruction dispersed across time and space, typically not viewed as violence at all
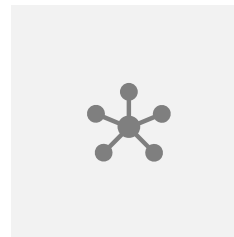
Epistemic

Violence effaced and occluded; of victims, bystanders, non-automobilized peoples
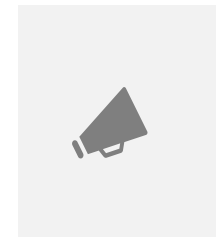
Ontological

The technoscientific actualization of settler colonialism and of the modern "politics of being" that had enabled it --"othering" and the "enserfing" of non-automobilized humans across the entire planet.

The political ontology of the accident

Quick artefact analysis
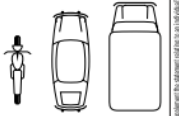
➢ Private document made public

➢ Main actor: the vehicle

➢ Non-human agents as "Circumstances"

➢ Bodies as vehicle-objects

➢ Human injury as yes/no options

➢ Animals not present

➢ …..

An "accident" is (created as) a mobile sociotechnical event enacted in fixed timespace; a collision creating agencyless (degraded) inanimate bodies and humans endowed with agency.

16

The politics of automobility

The political constitution of humans and non-humans is the very creation of these entities in terms of mobile human and non-human:

➤ Violence is constitutive of the „world" of automobility

➤ Entities therein are cyborgs (technosocial assemblages) enduring or meting out violence

➤ Violence is transformed into ontological violence

Graham

2. What is responsibility in innovation?

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Responsible Research and Innovation

"Taking care of the future through collective stewardship of science and innovation in the present."

Stilgoe et al (2013)

❖ **RRI** is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to 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,Rene (2012)

❖ **RRI implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole R&I process in order to better align both the process and its outcomes with the values, needs and expectations of society.**

❖ **RRI** is implemented as a package that includes multi-actor and public engagement in R&I, enabling easier access to scientific results, the take up of gender and ethics in the R&I content and process, and formal and informal science education."

(https://ec.europa.eu/programmes/horizon2020/en/h2020-section/responsible...

What is Responsible Research and Innovation in policy?
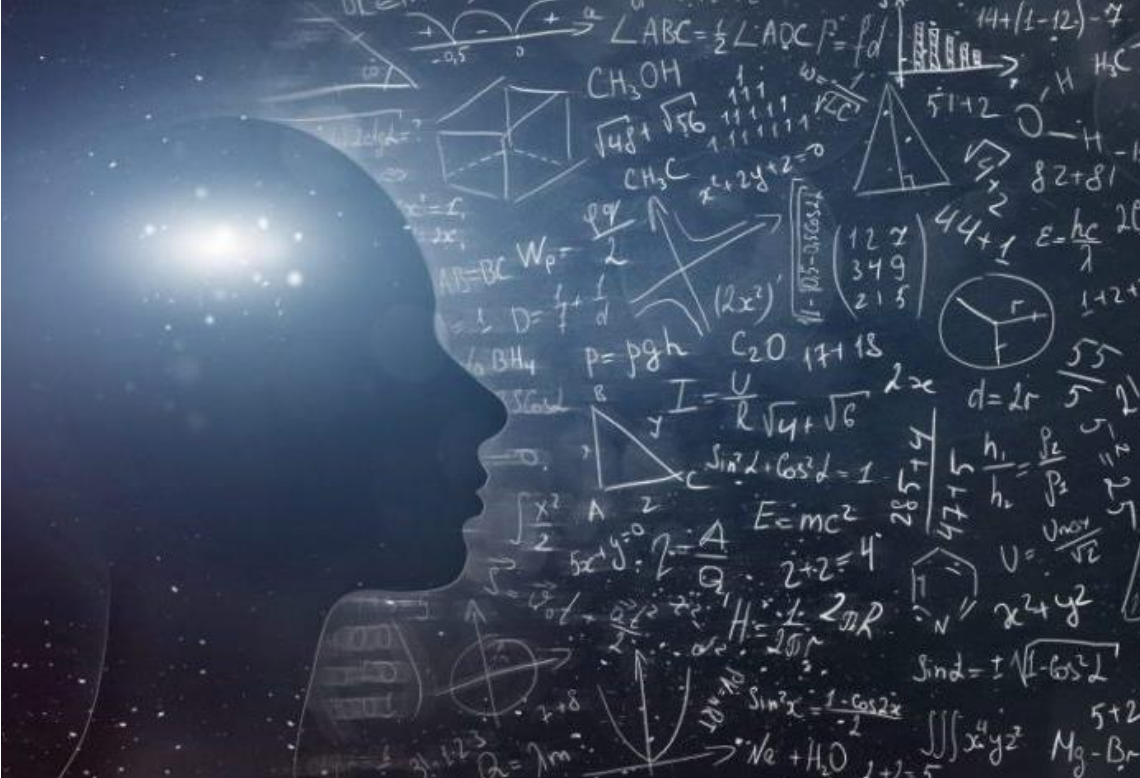
© Trilateral

The STS heritage

Importance of analytical and conceptual rigor
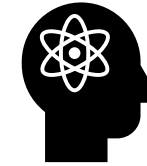
Academic criticism of RRI as policy

❖ Academic heritage of STS stemming from ELSA, ethics, STS and technology assessment (Klassen et al. 2019).

❖ Importance of analytical and conceptual rigor and less concerned with political and institutional viability (RRI as a "policy artefact" Owen and Pansera 2019b: 3) and "policy-driven discourse" (Owen and Pansera 2019a: 26)

❖ "RRI keys have more to do with the bureaucracy of maintaining the SwafS/RRI as a cross-cutting theme than with the conceptual foundations of RRI" (Rip 2016: 292).

❖ As opposed to the normative, policy oriented 'keys' they emphasize four process dimensions: Anticipation, Inclusion, Reflexivity and Responsiveness (AIRR, (Stilgoe et al. 2013: 1570).

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"RRI implies that societal actors (researchers, citizens, policy makers, business, third sector organisations, etc.) work together during the whole R&I process in order to better align both the process and its outcomes with the values, needs and expectations of society."

Social Imaginaries

Appadurai, Taylor, Jasanoff & Kim

Values, needs and expectations ——— Social order

Social imagination ——— An organized field of social practices as a key ingredient in making social order

Sociotechnical Imaginaries ——— Collectively held, institutionally stabilized, and publicly performed visions of desirable futures, animated by shared understandings of forms of social life and social order attainable through, and supportive of, advances in science and technology.

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How to?

Doing responsibility

ETHICS
LAW
TECHNOLOGY
POLICY
SOCIETY
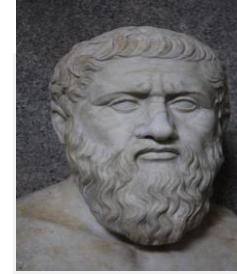
Plato
"Wherever you go, you will be a polis"

Paul Fayerabend
R&I to be put under democratic control

Richard Owen
R&I as part of democratic political governance

Donna Haraway
Be response-able

Responsibility

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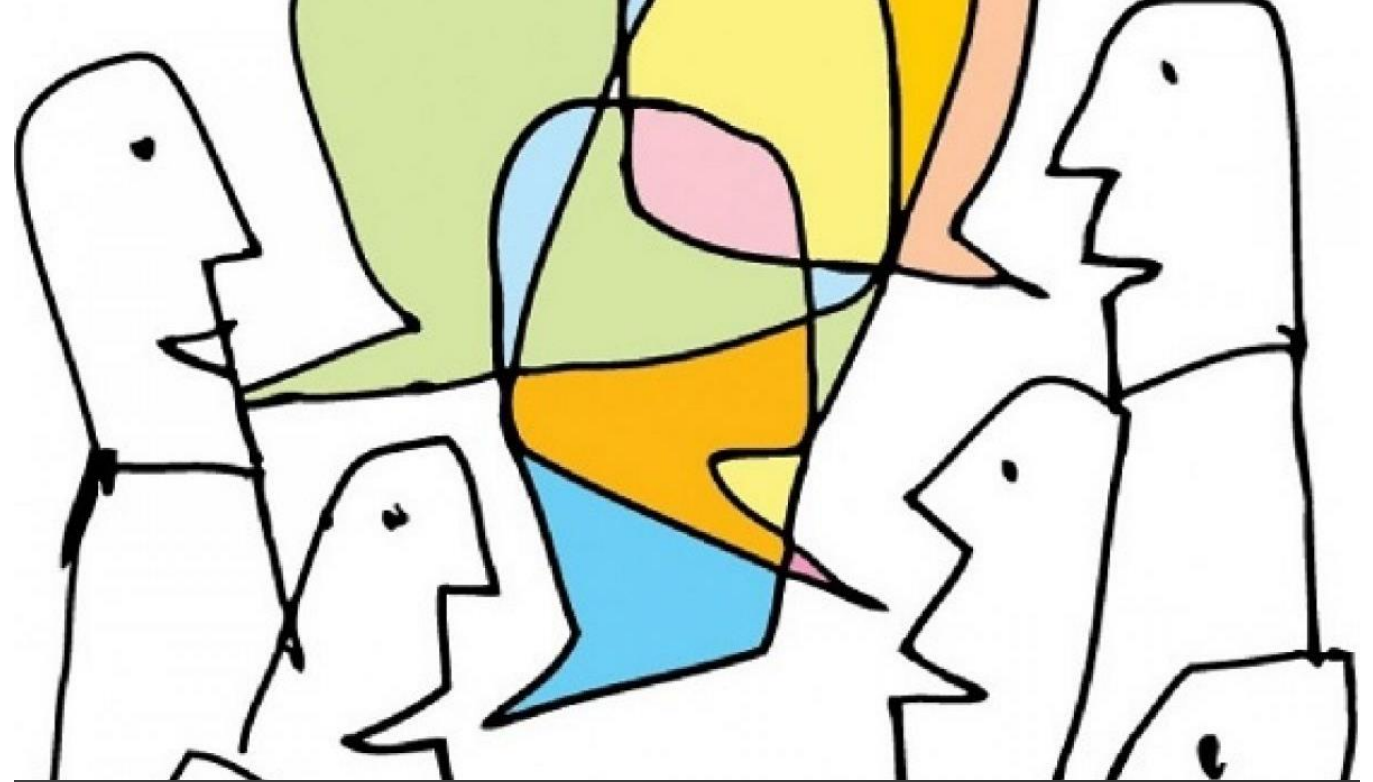
- Responsible Research and Innovation is a **transparent**, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) **acceptability**, **sustainability** and societal **desirability** of the innovation process and its marketable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

  - Von Schomberg,Rene (2012)

➤ (Enabling response) attention to the details of a text;

➤ It is about taking what you find inventive and trying to work carefully with the details of patterns of thinking (in their very materiality).

➤ All the "re's", like "restoration", "reintroduction", "rehabilitation", "remediation" must be taken as questions, not answers.

➤ [You] need to confront the questions of agency and responsibility, the violence of all cuts (including "restorative" ones), and their constitutive entanglements, with all the associated ethical, epistemological, and ontological implications of the reconfigurings of spacetimemattering.

Karen Barad, Intra-active Entanglements

Response-ability

Becoming with others

3. Presentations

Current theme analyzed from a critical responsibility point of view (15 mins)

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- Group presentation grade (based on
  - creativity,
  - interactivity and
  - depth of analysis

  same for all group members.

- Individual grade for each member (based on:
  - presentation skills,
  - enthusiasm
  - ability to keep up the interest of fellow students.

Grading

4. „Innovation" in automobility

a critical perspective

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?

A neoliberal technology push agenda?

○ Cradle-to-cradle challenges/"sustainability"

○ Negative externalities/"awayism"

○ Private/public challenges/"inequality"

○ Automobile demographics challenges/"Global north vs. global south"

○ Violence challenges

Electromobility

?

A new neoliberal technology push agenda?

○ Data challenges

○ Driver/safety challenges

○ Congestion challenges and miles travelled

○ Automobile demographics challenges/"Global north vs. global south"

○ Violence challenges

Autonomous mobility

?

An even newer neoliberal technology push agenda?

- Data challenges
- Spatial challenges
- Inequality challenges
- Congestion challenges
- Violence challenges

Aeromobility

5. Artificial Intelligence

a critical perspective

Arithmetic decision-making

Arithmetically controlled decision-making is a procedure in which decisions are partly or completely delegated – via other persons or corporate entities – to automatically executed decision-making models to perform an action.
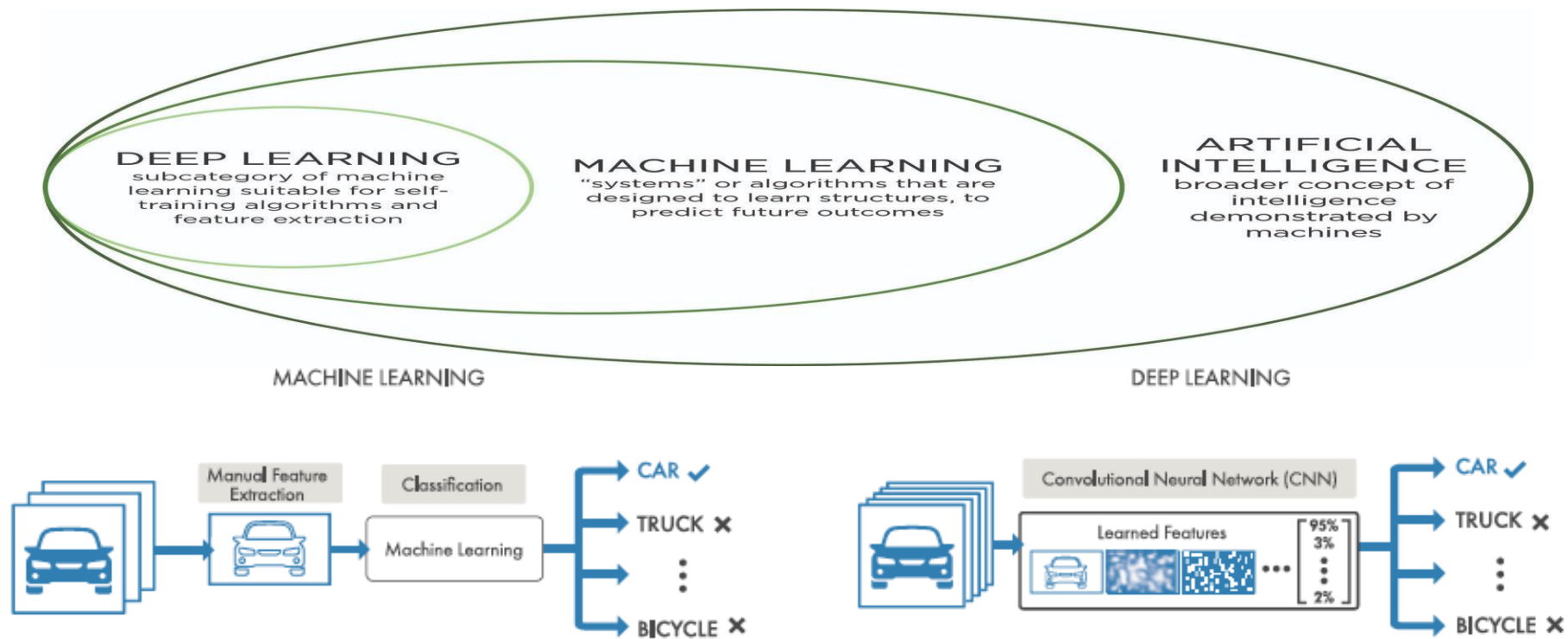
Arithmetic decision-making

Used in:
• Categorizing unemployed (AMS)
• Manufacturing robots
• Autonomous vehicles
• Medical diagnostic systems, etc.

Socio-ethical challenges:
• Ethnic bias
• 'Moral machine'
• 'Trolley problem'
•. Unintended consequences

A delegation problem

How to make ADM '*better*'?

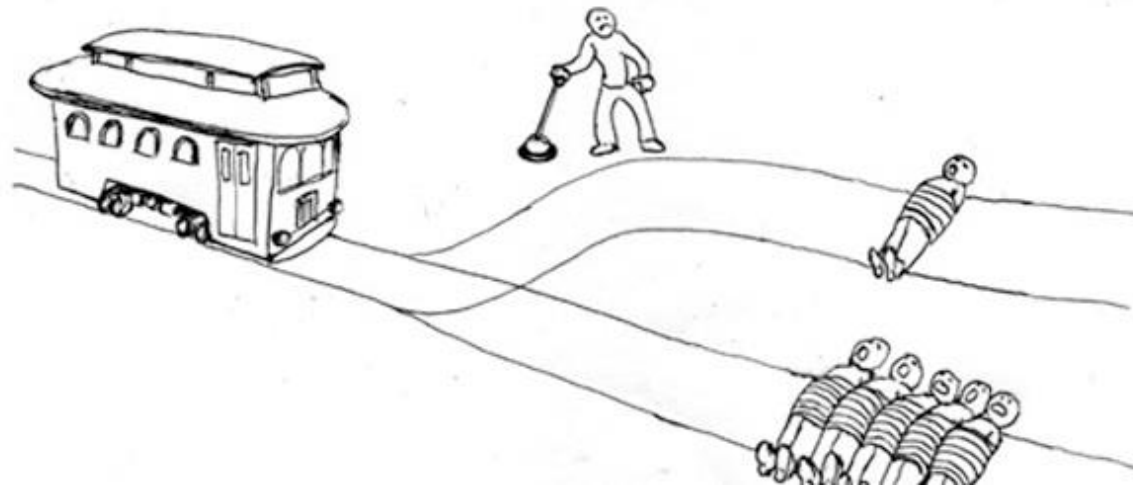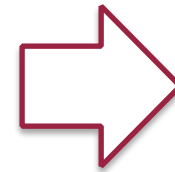**How to make our '*judgment better*'** on when, why and how to delegate human decisions to ADM?

Responsible AI

- ➢ Problem is not new -- *no need to reinvent the wheel*;

- ➢ Human decision-making are complex setups of personal, societal and cultural determinations individualized by the context, personal weighing of expected utility and a number of biases and heuristics – *no one solution, focus on context and options*;

- ➢ The principal-agent problem is not addressed via assessing the epistemic qualities of the agent, but by her intent to represent the interests of the principal suitably – *shift from epistemology to politics*;

- ➢ Principal side overconfidence as behavioral bias is expected to be utility destructive – *pay attention to overconfidence, cf. taken-for-grantedness*.

Responsible AI 2

➢*Accountability:* the need to explain and justify decisions the AI makes and is ensured if decisions are derivable from, and explained by, the ADM used.

➢*Responsibility* the capability of AI systems to answer for their decisions, to identify errors or unexpected results. This also means the need to link ADM to the fair use of data and to the actions of stakeholders involved in the system's decision.

➢*Transparency* refers to the need to describe, inspect and reproduce the mechanisms through which AI systems make decisions and learn to adapt to their environment, and to the governance of the data used or created.
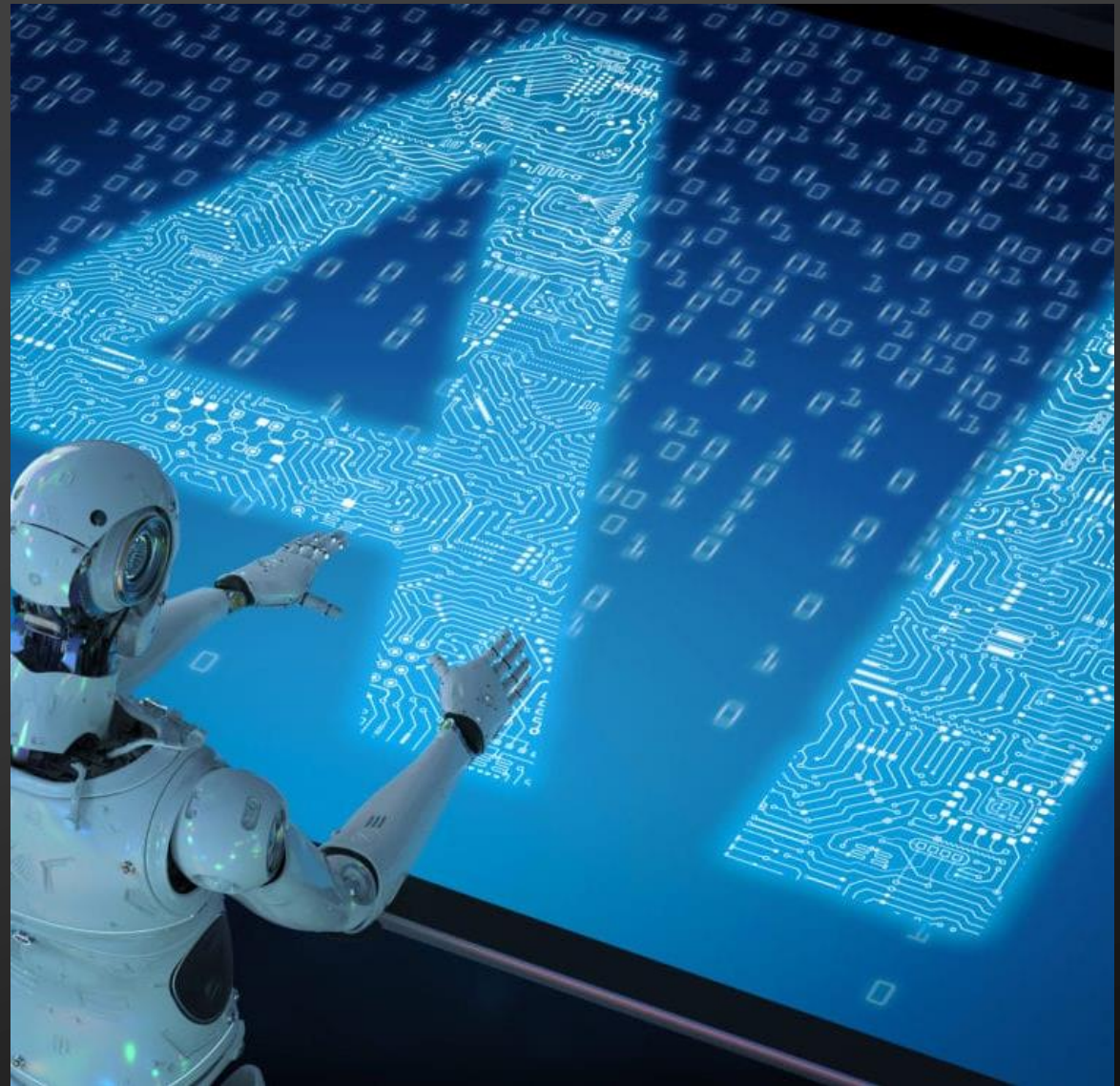
Summary

Thank you

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🌐 http://www.ihs.ac.at/