esdit

ethics of socially disruptive technologies

2023-2024 Annual Report

Overview, research lines and tracks reports, output, researchers and budget information.

Ethics of Socially Disruptive Technologies (ESDiT)

NWO grant number: 024.004.031

www.esdit.nl

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Consortium Partners

UNIVERSITY OF TWENTE.

TU Delft Delft University of Technology

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

WAGENINGEN UNIVERSITY & RESEARCH

Universiteit Utrecht

UMC Utrecht

Universiteit Leiden The Netherlands

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Introduction

ESDIT 2023-2024

Welcome to the 2023-2024 annual report of the Ethics of Socially Disruptive Technologies (ESDiT) research programme. During the years 2023-2024, the ESDiT programme reached full strength, involving over 100 researchers (regular and affiliate members). We started seeing many publication results from our efforts, and we were able to start new projects that built, in part, on earlier ones. We also had a very successful second ESDiT conference, co-organised with the 4TU.Centre for Ethics and Technology.

We successfully passed the NWO midterm review by an international external panel. The review report stated [translated from Dutch]: "The committee is very pleased that such a diverse composition has been achieved in this consortium and that the younger generation of ethicists and philosophers of technology is learning to work together." The committee also stated that we made a good start, and that the organisational structures are well-chosen and effective.

Based in part on feedback by the committee and in part on our own internal assessment, we spent a good deal of 2023 and 2024 further developing our strategy, so as to arrive at a more systematic approach in the programme. One of the changes we made is to reorient the structure of four research lines and three tracks towards nine more focused research lines. This was implemented in late 2024. Research lines were also asked to work on the basis of an annual plan, and to relate more systematically to the overall objectives of ESDiT.

ESDiT has been fortunate to attract highly qualified PhD candidates and postdoctoral researchers, as well as strong-performing mid-career scholars, and we are deeply grateful for their outstanding contributions to the programme. The years 2023 and 2024 has made us optimistic about the great achievements that we can expect from ESDiT!

Looking ahead, ESDiT continues to work toward a future where innovation and ethics advance hand in hand, in the service of people and the planet alike. We are grateful to all who share and support this mission.

Sincerely,

Prof. Dr. Philip Brey

ESDiT programme leader

Overview

Information about the ESDiT consortium, governance & organisation of research

Summary

The NWO/OCW funded Gravitation programme Ethics of Socially Disruptive Technologies started in 2020. It is a research programme with seven Dutch participating universities, a combined budget of € 28 million and a running time of 10 years. The aim of the programme is to develop new theories and methods that are necessary to understand, morally assess and intervene in the development and implementation of the socially disruptive technologies of the 21st century.

This report covers the years 2023 and 2024. In 2024, a new research strategy with new research lines was under development to support better organisation, coordination and synthesis of the programme's larger research objectives. The details of the new research strategy and its implementation will be provided in the annual report for 2025.

ESDiT also organised an international conference, together with 4TU Ethics in October 2024. 280 people from different countries attended the conference, titled: *Rethinking Ethics, Reimagining Technology*. The seven tracks included themes like *AI – Intelligent Artifice?, Bodies, Minds and Subjects, Concepts and Values, Disruptive Technology and Health, Geo-technology and Bio-technology,* among others.

Consortium

In 2023 we hired an additional three PhD candidates and one Postdoc and in 2024 10 PhD candidates and 2 Postdocs.
By the end of 2024, almost seventy-nine researchers had started collaborating in the programme, forty-three of which are fully funded through the Gravitation grant (including the six PI's) and another thirty-six who are partly funded by it (referred to as in-kind fellows).

The distribution of fellows over participating institutions is as follows:

University/research fellow	funded	in-kind	total
Delft University of Technology	10	11	21
Eindhoven University of Technology	11	9	20
University of Twente	10	6	16
Utrecht University	7	9	16
Wageningen University & Research	5	1	6
Total	**43**	**36**	**79**

These numbers reflect only those who dedicate research time to the programme. Another thirty researchers are connected to the programme in other ways, such as co-supervising PhD candidates (referred to as associate fellows). We especially want to mention Prof. Thomas Bäck (Leiden University) and Prof. Nick Ramsey (UMC Utrecht), who contribute valuable expertise to the programme.

Governance

The programme is managed by a Management Board, consisting of nine members. This Board is chaired by the programme leader (Prof. Philip Brey). Day-to-day management

has been delegated to the Daily Board, which consists of the programme leader, and two support staff members, namely an interim programme manager (dr. Wendy Aartsen) and a project manager (Seeta Autar). The vice programme leader (Prof. Sabine Roeser) receives all minutes of the Daily Board and provides input on the more strategic matters.

There have been three changes in the composition of the Management Board of the consortium. Prof. Dr. Marcel Verweij left Wageningen University and Research in May 2023; Prof. Dr. Vincent Blok replaced him. Prof. Verweij joined the board as a member of Utrecht University. Dr. Julia Hermann replaced Prof. Dr. Peter-Paul Verbeek as Management Board Member of the University of Twente.

Organisation of research

ESDiT aims to achieve five main objectives, namely: Understanding the disruptive effects of 21st Century SDTs, SDTs and Conceptual Disruption, New Approaches for Ethical Assessment and Guidance of SDTs, Technology ethics and multi-and Transdisciplinarity, and Innovating Practical Philosophy. The primary means for realizing these objectives are the four ESDiT research lines (RLs), together with synergy activities between the research lines and cross-cutting research tracks. While the research lines discuss social and conceptual disruptions in different (ontological) domains from a philosophical and moral point of view, the research tracks add additional lenses to these, allowing cooperation and synergy between the research lines.

esdit research matrix

Art track

STEM track

Inter-cultural track

Research tracks, each with 1-2 leaders & 1-2 coordinator(s)

The human condition

Dr. Janna van Grunsven

Nature, life & human intervention

Dr. Bernice Bovenkerk

The future of a free & fair society

Dr. Patrik Hummel

Dr. Emily Sullivan

Foundation & synthesis

Dr. Michael Klenk

Dr. Elizabeth O'Neill

Research lines, each with 1-2 leader(s) & 1-2 coordinators

Dr. Aafke Fraaije

Dr. Matthew Dennis

Dr. Gunther Bombaerts

Dr. Julia Hermann

Dr. Elena Ziliotti

The coordinators, all young & upcoming scholars

Each of the research lines is led by two members of the Management Board. They are responsible for the scientific excellence of the research line and its integration into the overall research programme. In each of these lines, a tenure tracker is responsible for the day to day coordination. Each line meets approximately once every 6-7 weeks, and extra meetings may be scheduled for colloquia and reading groups.

Each of the tracks is led by one member of the Management Board. In each of these tracks, a tenure tracker is responsible for the day to day coordination. Each track meets approximately once monthly, and extra meetings may be scheduled for colloquia and reading groups.

In addition to setting up the meetings of the individual research lines, we have also started organising plenary events that emphasize the programme's overarching themes. In 2023 and 2024, the following consortium wide meetings were organised :

2023

Workshop 24 May 2023	'Engaging with empirical studies as philosopher'
Away Days 15-16 June 2023	
Workshop 25 September 2023	'Introduction workshop for new hires'
Annual Research Day 16 November 2023	'Building blocks for concepts, theories, and methods in ethics of technology'

2024

Away Days 20-21 June 2024	
ESDiT/4TU.Ethics conference 2-4 October 2024	'Rethinking Ethics – Reimagining Technology'
Workshop 6 November 2024	'Technologies of prospection'
Annual Research Day 24 November 2024 (moved to 27 March 2025 due to higher education strike)	'Exploring Collaboration and Impact'

We have organised interactions between the research lines in the following ways:

- Coordinator meetings

  Coordinators of the research lines and tracks meet regularly to discuss strategies and collaboration on the ESDiT research goals, as do the postdocs in the programme.

- Joint publications

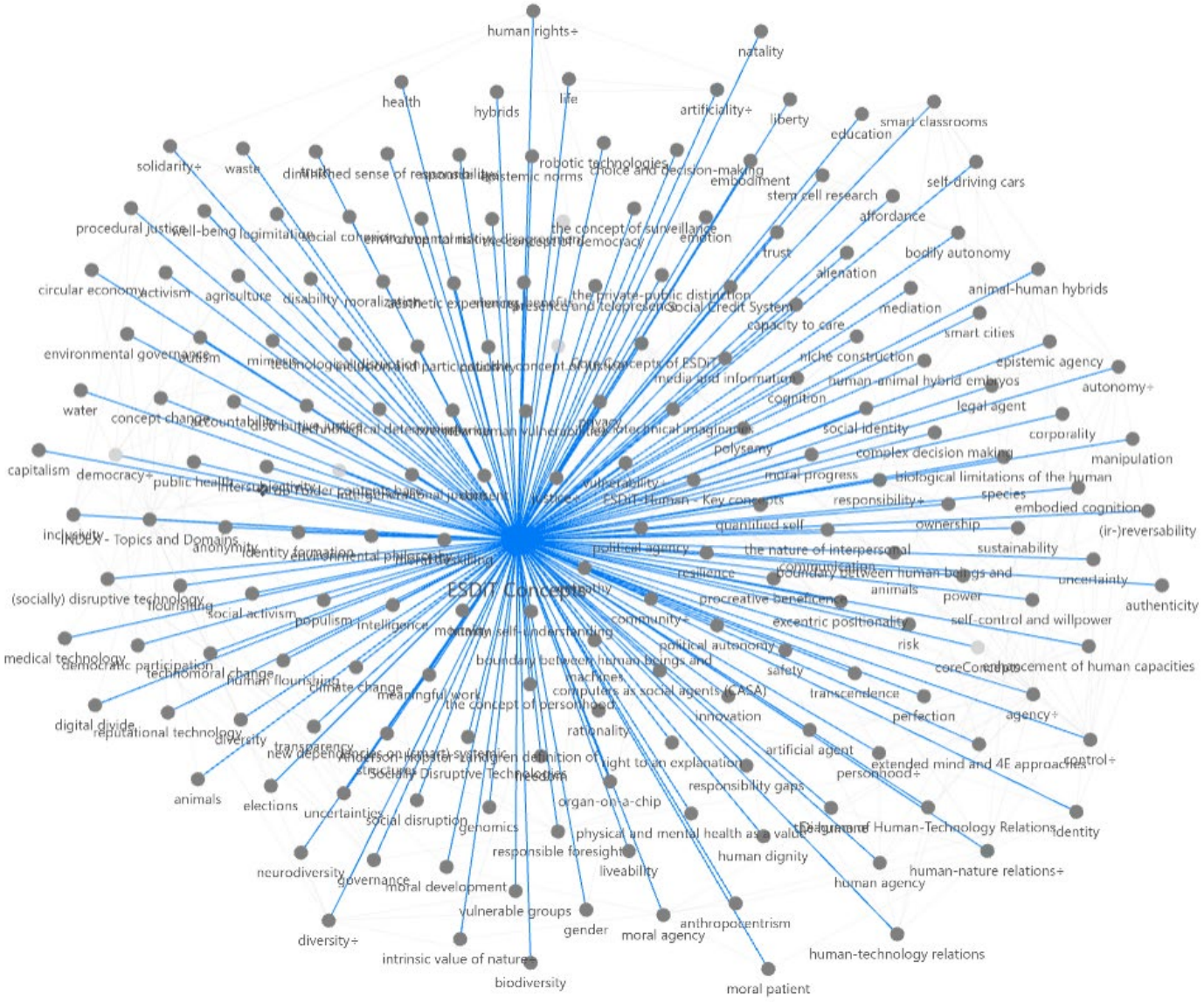
  We stimulate joint publications between members of different research lines, on shared ESDiT objectives.

• Conference

In 2024, ESDiT and 4TU.Ethics organised a conference with the theme *Rethinking Ethics - Reimagining Technology*, bringing together scholars working on philosophy and ethics of technology to analyse concepts, reflect on methods for studying and evaluating technology, examine case studies, and develop practice oriented approaches focused on design and social implications. Nearly all ESDiT members participated, along with over 180 researchers from countries all over the world. The research lines got an opportunity to showcase their work at the conference.

• Slack and Obsidian

We use Slack and Obsidian as shared communication and research tools, to support collaborative research and sharing of progress. The infographic below represents the wide range of topics covered by the programme.



Line Reports

Reports from the research lines and reports from the tracks

Reports from the research lines

Each research line reported on the progress they had made in the years 2023-2024.

The Human Condition

Leads: Prof. Dr. Joel Anderson and Prof. Dr. Wijnand IJsselsteijn

Coordinators: Dr. Janna van Grunsven (2023) & Nolen Gertz (2024)

Objective: To study how socially disruptive technologies (SDTs) disrupt the human condition and human self-understanding, and concepts related to these.

Actions and events: Five PhD and two postdoc projects were initiated to examine how emerging technologies such as brain-computer-interfaces, digital communication technologies, social robots and machine learning used for psychiatric diagnostics bear on concepts such as personhood, empathy, human well-being, and the human mind and body. Additionally, our line organised two events with external speakers: Sylvie Delacroix, King's College and Matthew Congdon, Vanderbilt University, on LLMs, Law, and human nature and on moral & conceptual change (co-organised with the synthesis line) respectively. Moreover, we collaborated with the society line and STEM track to organise an event on 'diversity & technology. Finally, we organised a full-day 'internal' event, in which our line collectively reflected on the idea that technologies 'reconfigure' the human.

Results: Caroline Bollen was the first ESDiT PhD candidate to defend her dissertation on empathy for a diverse and digital world in 2024 (Cum Laude). The above-mentioned workshop on 'reconfiguring the human' was also highly productive, as it led to a co-authored article on human vulnerability and responsible computing, on which 9 human nature line members collaborated, namely: Janna van Grunsven, Naomi Jacobs, Bart Kamphorst, Michaela Honauer, Bouke van Balen, Caroline Bollen, Matthew Dennis, Anna Puzio, M. Birna van Riemsdijk.

Nature, Life & Human Intervention

Leads: Prof. Dr. Ibo van de Poel and Prof. Dr. Vincent Blok

Coordinator: Dr. Bernice Bovenkerk

Objective: To understand the philosophical and ethical impacts and implications of SDTs for nature, and the concepts disrupted by these technologies.

Actions and events: We studied the disruptive potential of SDTs for nature in the following technologies: digital technologies, biomimicry, glacial protection, water recycling, synthetic biology, gene drives, energy transition technologies, and carbon dioxide removal. Based on reading groups, colloquia on paper projects (e.g. on irreversibility), meetings on particular concepts (e.g. eco-anxiety), and sessions with internationally renowned speakers (e.g. Christopher Preston, Freya

Matthews, David Schlosberg), we operationalized the objectives of the nature line with the following research foci:

1. Nature of control and our control of nature
2. Role of specific concepts in discourses about nature
3. Role of emerging technologies in countering anthropogenic changes to the environment
4. Patterns of disruption of current technologies focusing on nature
5. Role of emotions (such as eco-anxiety) in environmental ethics
6. Relational, intercultural, and multispecies approaches in environmental philosophy

In addition, we started new projects to serve this research agenda (e.g. on patterns of 21st century SDTs and on justice concerns in energy transitions).

Results: We have distinguished several types of technologies and levels of disruption:

1. Technologies that have unintentionally put humanity on the pathway of the Anthropocene
2. Technologies that intentionally intervene into (socio-)natural processes, systems or entities (such as cells or glaciers) to diminish the consequences of environmental disruption
3. Technologies that aim to mimic natural processes or features in order to diminish the consequences of environmental disruption. All three types of technologies challenge conceptual boundaries and concepts, calling for the conceptual extensions (e.g., the concept of justice) and the consideration of non-anthropocentric and non-Western centered conceptualisations and ethics of nature and society.

Collaboration with the synthesis line resulted in a shared paper on the conceptual appropriation of nature. Several journal articles have been published (e.g. on biomimicry, synthetic biology, and eco-anxiety) that have contributed to our research objectives. Several members of the Nature Line collaborated on a systematic review of the use of the concept of (ir)reversibility in scientific literature on anthropogenic environmental changes.

The Future of a Fair & Free Society

Lead: Prof. Dr. Sabine Roeser

Coordinators: Dr. Patrik Hummel and Dr. Emily Sullivan

Objective: To study the effects of SDTs on politics, society, and social institutions, and to assess how we can realize and adjust normative ideas in the context of SDTs.

Actions and events: A monthly reading group focused on how individual and collective forms of deliberation and related concepts are disrupted and

reconfigured particularly in machine learning and climate change. A new PhD project was initiated on the disruptive effects of content generation technologies on authorship, ownership, and creativity. In its meetings, the group developed line-specific operationalizations of overarching ESDiT objectives, e.g., the exploration of non-standard, diverse, intercultural approaches to justice and human rights around SDTs as instances of new models of multi- and transdisciplinary research. Line members also participated in initiatives led by other lines, such as the ESDiT Diversity Workshop and the Technology and Regulation workshop hosted by the Human Line. A joint presentation on macro-patterns of SDT was prepared for the ESDiT Away Days.

Results: The society line has made substantial progress on understanding societal issues raised by new digital and sustainable technologies. The line's research activities and outputs analyse how SDTs undermine and reconfigure key background conditions of individual and collective deliberative practices. A reoccurring theme is that 21st century SDTs (purport to) decrease uncertainty in various domains and advance the frontier between uncontrollable and controllable processes at a much higher speed, scale, and depth than previous technological change. Methodologically, the outputs highlight that guidance towards the future of a fair and free society in the context of SDTs can claim credibility only if it is informed by a plurality of philosophical and cultural traditions as well as state-of-the-art empirical evidence.

Foundation & Synthesis

Lead: Prof. Dr. Philip Brey

Coordinators: Dr. Michael Klenk and Dr. Elizabeth O'Neill (report contributed by Samuela Marchiori)

Objective: To investigate the nature of socially disruptive technologies, the nature of conceptual change and disruption, and new methods in ethics.

Actions and events:

1. Moral articulation reading group, including a workshop with Matthew Congdon (author of the book *Moral articulation*)
2. Monthly seminars open to other research lines on topics surrounding conceptual disruption, conceptual change, conceptual engineering, and methodological work in the (moral) philosophy of technology
3. A Writing Retreat for Research Line members to discuss the state of the art surrounding the ontology of 21st century socially disruptive technologies
4. Regular collaborations with other research lines in the form of educational offerings (e.g., PhD seminars) and internal working groups (e.g., about social disruptiveness and the AI Act).

Results: Substantial progress on how to understand the notion of socially disruptive technologies, the types of impacts of socially disruptive technologies, the relationship between technology and conceptual disruption and change, and mechanisms by which technologies may contribute to moral change. Output: several published papers, a Special Issue on *Socially Disruptive Technologies and Conceptual Engineering* in *Ethics and Information Technology*, and collaborative chapters in the book *Ethics of Socially Disruptive Technologies: An Introduction*.

Reports from the research tracks

Each research track reported on the progress they had made in the years 2023-2024.

Intercultural Track

Lead: Prof. Dr. Ingrid Robeyns

Coordinators: Dr. Elena Ziliotti (Gunter Bombaerts assumed primary leadership during September 2023 to April 2024)

This track was formed to ensure engagement with non-western philosophical perspectives. It aims to understand how different cultural perspectives influence views on technology and what a moral assessment of SDTs would look like when the intercultural dimension of ethics of technology is taken into account. In 2023 and 2024, the ESDiT consortium significantly expanded its engagement with intercultural philosophy, bringing perspectives from Buddhism, Confucianism, Ubuntu, African philosophy, and Indigenous traditions into dialogue with the ethics of disruptive technologies. Activities included an online lecture series, regular reading groups, and the workshop *Attention: Buddhist and Western Ethics* (2023), which explored cross-cultural perspectives on attention and digital life.

Several PhD projects advanced this intercultural agenda. Arthur Gwagwa's work on *Re-imagining African Unity in a Digitally Interdependent World* examined how African normative resources can shape responses to global digital power. Joseph Sta. Maria developed a Confucian framework for digital flourishing, applying it to cases such as online gaming. Kristy Claassen explored how concepts such as Ubuntu and Indigenous epistemologies can reshape notions of moral character in technological contexts. Patricia Reyes Benavides integrated Indigenous perspectives into debates about digital platforms and climate activism. Elias König examined justice and sustainability through critical theory and Chinese philosophy, connecting intercultural resources to Anthropocene challenges. These projects complement publications by ESDiT members. Elena Ziliotti's *Meritocratic Democracy: A Comparative Political Theory* (*Oxford University Press*, 2024) broadens political philosophy with comparative and intercultural analysis. Together with Matthew Dennis, she also published *Living Well Together Online: Digital Wellbeing* from a Confucian Perspective (*Journal of Applied Philosophy*, 2023). Furthermore, Bombaerts et al. (2023) explored attention as an ethical practice in *Global Philosophy*, integrating Buddhist and Western insights.

Through these initiatives, ESDiT has established intercultural philosophy as a vibrant and growing strand of its research, ensuring that the ethics of disruptive technologies are informed by diverse global traditions.

Social media platforms as disruptive epistemic environments

Dr. ir. Lavinia Marin

Goal: This project aims to answer the following research questions: i) What are the features of an epistemic environment that promotes the epistemic flourishing of its inhabitants? ii) How should we conceptualise the epistemically disruptive role of social media platforms? iii) How do social media platforms shape the user's epistemic agency? iv) What kind of designed affordances and scaffolds would make social media platforms conducive to knowledge sharing? v)What kind of designed affordances and scaffolds foster epistemic virtues for the users of social media platforms? vi)What is the role of emotions in fostering epistemic practices online?

Progress: The work on this project resulted in several papers, some published collaboratively, addressing the research questions (ii), (v) and (vi), and partially addressing question (iv). These papers propose new conceptual tools for understanding how platforms disrupt knowledge sharing and for understanding epistemic interfaces, discuss how specific mechanisms of social media platforms can function as 'hostile attentional scaffolds', and analyse how emotions contribute to or undermine epistemic practices online. The publications served to significantly advance research questions (v) and (vi) and partially advance research question (ii). The Voinea et al. paper identifies specific designed affordances (intermittent reward systems, algorithmic content curation) that foster epistemic vices rather than virtues, demonstrating how platforms exploit psychological vulnerabilities. It also shows how negative emotions (anger, outrage) function as attentional scaffolds that undermine critical evaluation while promoting viral spread of information. In addition, the Steinert et al. paper shows the dual affective-cognitive nature of scaffolding in digital environments. My single authored paper on epistemic interfaces contributes an explanation of how social media platforms are epistemically disruptive through the idea of faulty interfaces between multiple epistemic environments, causing epistemic flooding and context collapse. However, the full extent of platform disruption across different user populations with various levels of epistemic agency still needs to be explored. Research questions (i), (iii), and (iv) are in the process of being developed further.

Voinea, C., Marin, L., & Vică, C. (2024). Digital slot machines: social media platforms as attentional scaffolds. *Topoi*, *43*(3), 685-695.

Marin, L. (2024). "A Place of very Arduous interfaces". Social Media Platforms as Epistemic Environments with Faulty Interfaces. *Topoi*, 43(5), 1517-1527.

Steinert, S., Marin, L., & Roeser, S. (2025). Feeling and thinking on social media: emotions, affective scaffolding, and critical thinking. *Inquiry*, *68*(1), 114-141.

STEM Track
(Science, Technology, Engineering and Mathematics)

Lead: Prof. Dr. Wijnand IJsselsteijn

Coordinators: Dr. Matthew Dennis (including input from Dr. Kathrin Bednar)

This track fosters interdisciplinary and transdisciplinary research on socially disruptive technologies. It does so by establishing links between relevant partners involved in STEM innovations and ESDiT researchers.

ESDiT continued to build on its connection with the Hybrid Intelligence Centre (HI) (a sister Gravitation research consortium, focused on Artificial Intelligence), through presentation series, workshops, reading groups, and collaborative research. The living labs initiative, in collaboration with the Responsible Sensing Lab (RSL) has two projects underway, both providing interesting and rich methodological insights into how we can identify ethical issues, elicit value experiences, and come up with prototypes that are informed by these insights. The projects also highlight the benefits and challenges of transdisciplinary collaborations.

Matthew Dennis received an Early Career Partnership Award, *Interdisciplinary Approaches to Reimagining Digital Well-Being* from the Royal Netherlands Academy of Arts and Sciences, allowing him to host an academic-impact workshop, together with his PhD student Lyanne Uhlhorn. The event invited digital well-being companies, designers, app makers, and tech companies for a two-day conference on how we can reimagine digital well-being.

Autonomy and smart mobility

Dr. Julia Hermann

Goal: This project aims to answer the following research questions: i) How does a smart system steering traffic in the city based on collective values affect car drivers' experience of autonomy? ii) How can we study this by letting participants interact with speculative prototypes and ask questions to them?

Progress: In late 2023, we conducted the interviews and a focus group for this study. Based on a first analysis of the data and insights gained during the project as a whole, in 2024, we formulated recommendations for the design and implementation of a value-based navigation app and wrote a report for the municipality of Amsterdam. Master's students from the University of Twente checked and translated the interview transcripts and we started with the in-depth thematic analysis of the interviews. The study resulted in the following activities:

1. *Driving for Values: How App Design Influences Drivers' Experience of Autonomy*, Workshop on Value Experience, Social Impact Factory Utrecht, 14 February 2024 (invited talk)

2. *Driving for Values*, post published on the blog *Justice Everywhere*, 12 February 2024

Thijs Turèl, Fabian Geiser, Julia Hermann, Kathrin Bednar, Ibo van de Poel, Wijnand Ijsselsteijn, Matthew J. Dennis, and Jop Pék (2024), *Driving for Values: An Explorative Study on Acceptance, Acceptability and Autonomy in the context of a Navigation Aid that Promotes Public Values*, Report for the Municipality of Amsterdam.

Art Track

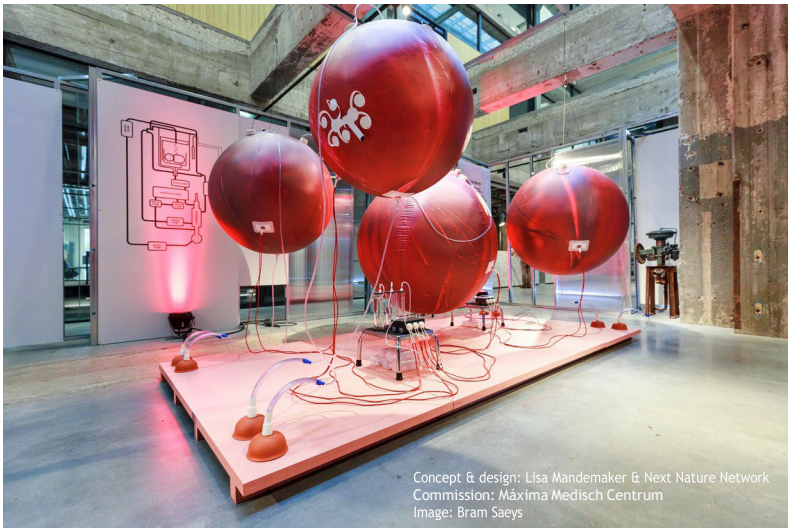
Lead: Prof. Dr. Sabine Roeser

Coordinators: Dr. Aafke Fraaije and Dr. Julia Hermann

This track was established at the beginning of 2023 to facilitate research on the interplay between art and the ethics of disruptive technologies. The track stimulates research on art, as well as collaborative research with artists.

Actions and events:
We organised regular online, interactive meetings on art and ethics of socially disruptive technologies. These meetings had a highly interactive format that engaged participants in the active experience of an artwork, the analysis of creative work, and transdisciplinary discussions. For many of these meetings, we invited artists, some of whom collaborated with ESDiT researchers. We covered topics related to art as an epistemic practice, the role of moral imagination, and narrative ethics. Additionally, we organised a techno-art exhibition in conjunction with the 4TU/ESDiT conference in at the University of Twente, at which nine artists exhibited their work. All artists participated in the conference and joined one of two panel discussions.

Results: The bimonthly meetings were crucial for building a community of ESDiT scholars around the intersection of art and the ethics of socially disruptive technologies. Since the track intersected with the research lines, the art track also contributed to intellectual exchange across research lines. Furthermore, the bimonthly meetings contributed to the development of several individual publications. The ESDiT art exhibition was built around existing relationships within the community, strengthening transdisciplinary relationships between individual artists and the ESDiT community. The exhibition lasted two months, enhancing the visibility of the ESDiT program, also after the conference.



The disruptive potential of the artificial womb

Dr. Julia Hermann

Goal: This project aims to answer the following research questions: i) How might ectogestative (or: artificial womb) technology disrupt concepts such as "mother", "father", "parent", "family", and "birth"? ii) How might it disrupt gender roles? iii) How might it disrupt parenting practices? iv)What are possible ethical, legal, social, and political im- plications of this technology?

Progress: This project resulted in several workshops and publications. In 2023, I continued working on a paper co-authored with Naomi Jacobs and Lily Frank on the disruption of the concept of mother and related concepts and completed the chapter for the ESDiT book as one of the lead authors. I moreover produced the following output:

1. *Farewell to Mothers? Artificial wombs and the future of human reproduction*, presentation at the *Emerging Technologies & Societal Transformations* Research Theme conference, University of Twente, 21 September 2023 (together with Naomi Jacobs)

2. Podcast on ectogestative technology, *The Dissenter*, released on 4 November 2024, available here. *The Disruption of Human Reproduction*, post published on the blog *Justice Everywhere*, 20 May 2024

Lily Eva Frank, Julia Hermann, Llona Kavege & Anna Puzio (2023), "Ectogestative Technology and the Beginning of Life", in: Ibo van de Poel et al., *Ethics of Socially Disruptive Technologies: An Introduction*, Open Book Publishers, pp. 113-140.

Outreach and impact

Our current research has great relevance for society, since new disruptive technologies will have a major role in shaping the 21st century; it is therefore imperative for societal actors to engage in ethical reflection on how to develop and implement these technologies responsibly. Consequently, we are keen to have an extensive dissemination and knowledge transfer strategy, including communication channels and outreach activities.

ESDiT has been moderately active on X/Twitter in 2023 and has a reach of over 800 followers, mostly philosophers and other academics. However, in recent times, many members of the academic community have deleted their Twitter accounts due to strong polarisation and monetization – this led ESDiT to also re-evaluate its presence and become less active on the platform. We also have profiles on LinkedIN and BlueSky. LinkedIn was actively used to promote the conference in 2024, beginning a new turn in using the platform to create a brand image and positioning for the programme.

During 2023/2024 the website was continuously updated with the research carried out by the ESDiT programme members, as well as events and public outreach such as the ESDiT podcast.

The internal newsletter is the main internal communication initiative within the Consortium. It was sent out bi-monthly in 2023 and 2024 and includes all the information and updates that are relevant to ESDiT Fellows. The various sections include News & Updates, What's Happening, What's Next, Worth Knowing, etc.

The ESDiT Impact Strategy was adopted in 2023. Many impact initiatives have been undertaken spontaneously within the consortium, including public events, exhibitions, and symposia targeting different stakeholders. A more programmatic approach is required to synthesize and coordinate impact activities.

ESDiT Podcast

The ESDiT-podcast contains a growing collection of interviews conducted amongst ESDiT researchers by ESDiT researchers. Each episode discusses a recent paper published by an ESDiT member, with the aim of reaching out to colleagues in the consortium as well as the broader academic community.

ESDiT Podcast 2023-2024 Episodes:

- Sven Nyholm on "A new control problem? Humanoid robots, artificial Intelligence, and the value of control" (16th of January, 2023)
- Guido Löhr on "Do socially disruptive technologies really change our concepts or just our conceptions?" (6th of February, 2023)
- Philip Brey on "The Ethics of the Metaverse" (28th of February, 2023)
- Elena Ziliotti on "Confucianism and Social Media Technologies" (9th of March, 2023)
- Adam Henschke on "When Enhancements need Therapy (23rd of June, 2023)

- Alessio Gerola on "The Ethics and Philosophy of Biomimicry" (15th of September, 2024)

- Kevin Macnish & Adam Henschke on "The Ethics of Surveillance in Times of Emergency" (23rd of September, 2024)

- Janna van Grunsven "on Moral Visibility and Technology" (4th of November, 2024)

- Caroline Bollen on "Empathy 2.0. What it means to be empathetic in a diverse and digital world" (10th of November, 2024)

- Ben Hofbauer on "Governing Prometheus: Ethical Reflections on Risk and Uncertainty in Solar Climate Engineering Research" (24th of November, 2024)

Project Reports

Reports from the individual projects per research line

Project reports 2023-2024

Each project reported on the progress they had made in the year 2023-2024.

Natural Life & Human Interventions

Philosophical and ethical implications of biomimetic technologies

Alessio Gerola

Goal: The aim of the project is to reflect on the implicit conceptual and normative assumptions about nature, imitation, and technology that drive different biomimetic design trends. At stake are the ambiguity of biomimetic design in relation to the risk of replacing nature with an artificial copy, and its potential and limits as a paradigm for sustainable technology.

Progress: This project reflects on the philosophical and ethical implications of bioinspired technologies. The first article provided an analytical grid that enables the classification of different bioinspired and biomimetic approaches and technologies based on their conceptual and normative assumptions about nature and mimesis. In addition, together with other colleagues of the Nature Line and the Synthesis Line an article was prepared on the disruption of conceptions of nature and naturalness due to various emerging technologies, such synthetic biology, geoengineering, and biomimicry. A second article reflected on the political dimension of sustainable imaginaries of biomimicry through the lens of science fiction, analysing the risk of elite capture of alternative sustainable imaginaries such as solarpunk. A further article in preparation deals with the risk that biomimicry may become the next sustainability technofix, and employs the notion of conviviality by philosopher Ivan Illich to develop a critique.

Alessio Gerola, Zoe Robaey, Capturing the Sun: Solarpunk and the Elite Capture of Imagination, I Castelli di Yale online, 55-66. https://doi.org/10.15160/2282-5460/2928

Alessio Gerola, Zoe Robaey and Vincent Blok. What Does it Mean to Mimic Nature? A Typology for Biomimetic Design. Philos. Technol. 36, 65 (2023). https://doi.org/10.1007/s13347-023-00665-0

Jeroen Hopster, Alessio Gerola, Ben Hofbauer, Guido Löhr, Julia Rijssenbeek and Paulan Korenhof, 'Who owns 'Nature'?'. Environmental Values 33(4), 414-433 (2024).

The social and moral complexities of water recycling

Karen Moesker

Goal: The primary objective of this project is to comprehend the intricate social and moral aspects of water recycling technologies like DPR. By doing so, the aim is to gain deeper insights into how to address concerns about acceptance, acceptability, and

desirability within ongoing debates surrounding the sustainable implementation of such water recycling technologies.

Progress: Activities so far focussed on understanding the disruptive effects of 21st century disruptive technologies and developing new approaches for ethical assessment and guidance of socially disruptive technologies. Besides, work is ongoing on developing new models of multi- and transdisciplinary research, and on transformative engagement with practical philosophy.

Disrupting finitude: flourishing and nature

Dr. Lorina Buhr

Goal: The aim of this postdoc project is to investigate the research question: "To what extent are disruptions of finitude detrimental to the flourishing of animals, humans, or the natural world, and how do related technologies challenge our understanding of irreversibility, finitude and flourishing?"

Progress: To achieve the goals of this project, four tracks were set up: A) Interdisciplinary study of the concept of irreversibility, consisting of systematic literature review of the use of the concepts of irreversibility and tipping points in research on human-induced environmental changes, in collaboration with colleagues from Environmental Sciences, Physics and Climatology; B) Analysis of the ontological dimensions of extinction and de-extinction technologies; C) Analysis that examines Anthropocene technologies using the category of ir/reversibility, with a particular focus on technologies for glacier protection, a topic that so far has been largely neglected in philosophy and ethics of technology; D) Aesthetic-social analysis of finitude in nature and media technologies that document finitude in nature, with a particular focus on photography of retreating mountain glaciers. I participated in a number of talks, research colloquiums, and workshops. Two systematic literature reviews were also conducted.

Behnam Taebi, Dominic Lenzi, Lorina Buhr, Kristy Claassen, Alessio Gerola, Ben Hofbauer, Elisa Paiusco, and Julia Rijssenbeek. "4. Climate Engineering and the Future of Justice," in: Ibo van de Poel et al. (ed.), Ethics of Socially Disruptive Technologies. An Introduction, 2023, 83–112. https://doi.org/10.11647/obp.0366.04.

Publication of the paper Lorina Buhr 'Picturing finitude. Photography of mountain glaciers as a multiple practice of dealing with environmental loss', in *Environmental Values*, 33 (5) *https://doi.org/10.1177/09632719231221843; First published online January 15,* 2024

Intense work on the interdisciplinary systematic review project on the concept of irreversibility in nature and environment. Finally published on 31 Dec 2024: Lorina Buhr, Dominic S Lenzi, Auke J K Pols, Claudia E Brunner, Andrea Fischer, Arie Staal, Benjamin P Hofbauer, Bernice Bovenkerk, The concepts of irreversibility and reversibility in research on anthropogenic environmental changes, *PNAS Nexus*, Volume 4, Issue 1, January 2025, page 577, https://doi.org/10.1093/pnasnexus/pgae577

Governance of geoengineering in the face of normative uncertainties

Benjamin Hofbauer

Goal: The objective of this project is to develop a fine-grained conceptualization of normative uncertainties, while identifying and developing risk governance approaches that are most suitable for dealing with these uncertainties.

Progress: A variety of approaches and frameworks are employed to answer the overarching research question: 'How should the desirability of researching Stratospheric Aerosol Injection (SAI) be assessed, given its potentially highly disruptive effect on institutions, societal values and norms, as well as the physical environment?', as well as to understand and ethically account for the risks and uncertainties that solar climate engineering research invokes.

Dissertation: Governing Prometheus: Ethical Reflections On Risk & Uncertainty In Solar Climate Engineering Research, https://doi.org/10.4233/uuid:77b63c4a-85f7-4734-83f5-dd355b737191

Alleblas, J., and B. Hofbauer. 2024. "Negotiating Visions of Waste: On the Ethics of Maintaining Waste Infrastructures." In Maintenance and Philosophy of Technology, edited by Mark Coeckelbergh and Mark Thomas Young. Routledge Studies in Contemporary Philosophy. Routledge - Taylor & Francis Group. ISBN: 978-1-032-32686-3.

Buhr, Lorina, Dominic S Lenzi, Auke J K Pols, et al. 2024. "The Concepts of Irreversibility and Reversibility in Research on Anthropogenic Environmental Changes." PNAS Nexus 4 (1). https://doi.org/10.1093/pnasnexus/pgae577.

Hofbauer, B. 2024. "Governing Prometheus: Ethical Reflections On Risk & Uncertainty In Solar Climate Engineering Research." Dissertation (TU Delft), Delft University of Technology. https://doi.org/10.4233/uuid:77b63c4a-85f7-4734-83f5-dd355b737191.

Hofbauer, Benjamin. 2023a. "Normative Uncertainty in Solar Climate Engineering Research Governance." Ethics, Policy & Environment 27 (3): 451–70. https://doi.org/10.1080/21550085.2023.2216148.

Hofbauer, Benjamin. 2023b. "Systemic Risks and Solar Climate Engineering Research. Integrating Technology Ethics into the Governance of Systemic Risks." Journal of Risk Research 26 (12): 1383–95. https://doi.org/10.1080/13669877.2023.2288010.

Hopster, Jeroen K.G., Alessio Gerola, Ben Hofbauer, Guido Löhr, Julia Rijssenbeek, and Paulan Korenhof. 2023. "Who Owns NATURE? Conceptual Appropriation in Discourses on Climate and Biotechnologies." Environmental Values 33 (4): 414–33. https://doi.org/10.1177/09632719231196535.

Sand, Martin, Benjamin P. Hofbauer, and Joost Alleblas. 2023. "Techno-Fixing Non-Compliance - Geoengineering, Ideal Theory and Residual Responsibility." Technology in Society 73 (May): 102236. https://doi.org/10.1016/j.techsoc.2023.102236.

Wieners, Claudia E., Ben P. Hofbauer, Iris E. de Vries, et al. 2023. "Solar Radiation Modification Is Risky, but so Is Rejecting It: A Call for Balanced Research." Oxford Open Climate Change 3 (1). https://doi.org/10.1093/oxfclm/kgad002. Benjamin Hofbauer (2023) Normative Uncertainty in Solar Climate Engineering Research Governance, Ethics, Policy & Environment, https://doi.org/10.1080/21550085.2023.2216148

Martin Sand, Benjamin P. Hofbauer, and Joost Alleblas. "Techno-Fixing Non-Compliance - Geo-

engineering, Ideal Theory and Residual Responsibility.” Technology in Society 73 (May 2023): 102236. https://doi.org/10.1016/j.techsoc.2023.102236

Claudia E Wieners, Ben P Hofbauer, Iris E De Vries, Matthias Honegger, Daniele Visioni, Hermann W J Russchenberg, and Tyler Felgenhauer. “Solar Radiation Modification Is Risky, but so Is Rejecting It: A Call for Balanced Research.” Oxford Open Climate Change 3, no. 1 (February 14, 2023): kgad002. https://doi.org/10.1093/oxfclm/kgad002

Synthetic life and living technology – transcending dichotomies with synthetic biology

Julia Rijssenbeek

Goal: This project focusses on the following research questions: “What is the ontological and ethical status of hybrid entities deriving from synthetic biology often referred to as ‘living machines’, ‘cell factories’, ‘artificial life’, or ‘living technology’?“, and “How are key values like naturalness and sustainability affected by the disruption brought about by biotechnology and more specifically synthetic biology, as it promises to disrupt multiple domains ranging from agriculture and food to medicine and construction? “

Progress: So far, project activities have resulted in the following publications:

Hopster, J. K., Gerola, A., Hofbauer, B., Löhr, G., Rijssenbeek, J., & Korenhof, P. (2023). Who owns NATURE? Conceptual appropriation in discourses on climate and biotechnologies. Environmental Values, 09632719231196535.

Taebi, B., Lenzi, D., Buhr, L., Claassen, K., Gerola, A., Hofbauer, B., Paiusco, E., Rijssenbeek, J. (2023). 4. Climate Engineering and the Future of Justice. In Ethics of Socially Disruptive Technologies: An Introduction (pp. 83-112). Open Book Publishers.

Rijssenbeek, J., & Doeland, L. (2023). Metabolisme. Wijsgerig Perspectief.

Lunshof, J. E., & Rijssenbeek, J. (2024). Collaborative ethics: innovating collaboration between ethicists and life scientists. Nature Methods, 1-4.

Rijssenbeek, J. (2024). De ongemakkelijke eerste dans. Wijsgerig Perspectief.

The Human Condition

Brain-computer interfaces & the disruption of the concept of personhood

Bouke van Balen

Goal: The aim of this project is to answer the following research question: how do BCIs disrupt assumptions about where and how we can (or even should) demarcate something as ontologically and ethically significant as personhood? As a secondary objective, the project will contribute to new interdisciplinary approaches and methods at the intersection of STEM disciplines and ethics/philosophy. Moreover, insights gained from the project are likely to ethically inform the ongoing design of current and future BCI technologies.

Progress: The first period of this project was spent on preparing a research proposal, and on obtaining ethical approval for empirical research into the lives of people with severe communication problems due to paralysis. Besides, a paper was published on the concept of communication 'restoration' as it is used in the neuroscientific literature about Brain-Computer Interfaces, arguing that it differs from a phenomenological account of communication and misses out on embodied, relational, and social aspects of communication. Also, a book chapter was prepared, which argues that the field of augmentative and alternative communication technology (AAC-tech) and the experiences of people who use these technologies can inform phenomenological philosophy about embodied communication, and that the field of AAC-tech can learn from phenomenology to inform the design of future communication devices that suit the communication needs of individuals with communication impairments. Research updates include the recruitment and data collection of a transdisciplinary interview research project and work on four academic publications. I also attended the ESDiT conference, the OSZW conference, the Cyberrights Symposium and the ISVW Summer School Philosophy of Now. I organised the LIS webinar and the ESDiT Diversity Workshop.

van Balen, B., van Grunsven, J., Vansteensel, M., & IJsselsteijn, W. (2023). Brain Computer Interfaces: Kunnen breincomputers een stem geven aan niet-sprekenden? Wijsgerig Perspectief op Maatschappij en Wetenschap, 63(1), 16-23. Article 2. https://www.filosofie.nl/brain-computer-interfaces/

van Grunsven, J., van Balen, B. & Bollen, C. (2024). Three Embodied Dimensions of Communication: Phenomenological Lessons for and from the Field of Augmented and Alternative Communication Technology. In de Boer, B. & Zwier, J. (Ed.). Phenomenology and the Philosophy of Technology.

Van Balen, B. (2024). Waarom hersenchips geen gedachten kunnen lezen. *Bij Nader Inzien*. https://bijnaderinzien.com/2024/05/16/waarom-hersenchips-geen-gedachten-kunnen-lezen/

Van Balen, B. (2024). Deconstructing brainwaves with Foucault: Defamiliarizing perceptions of personhood as brainhood. *4TU Ethics Blog.* https://www.4tu.nl/ethics/blog/deconstructing-brainwaves-with-foucault-defamiliarizing-perceptions-of-personhood-as-brainhood/#:~:text=Author%20Bio,Find%20him%20on%20LinkedIn.

Philosophical anthropology research

Dr. Anna Puzio

Goal: This project will study how new and emerging technologies – biotechnologies, digital technologies, robots, and/or climate technologies – have implications for our ontological and ethical understanding of the human being. The project deals with the question of how the understanding of the human being changes in the context of new technologies.

Progress: It was found that new approaches in anthropology are needed, with New Materialism as a new approach. Furthermore, there seems to be a lack of diversity in health technologies. How to embrace diversity? Also, work was done on the transformation of the concept of the human being and the body through technology, and it was studied that our interconnectedness and relationships with non-human entities disrupt our ethical concepts. Several collaborative papers were started on robot ethics and ethics of health technologies (not published yet), and chapters on anthropology and ethics of technology in contributed volumes were finalized (not published yet). Besides, contributions were provided to two chapters of the ESDiT book (social robots and artificial womb), conference organisation on robot ethics and the body, and many international media contributions.

Emerging technologies and the moral character of the human being

Kristy Claassen

Goal: A defining characteristic of the African Philosophy of Ubuntu is that we become human through others. As the proverb goes, 'I am, because we are' (Mbiti 1990). This project investigates how Ubuntu can be employed to assess and evaluate the socially disruptive technology of artificial intelligence. By employing an Ubuntu heuristic, this project argues that central value concepts like privacy and human dignity are being disrupted. Furthermore, this project shows that current frameworks of conceptual disruption should be broadened to accommodate intercultural conceptual disruption.

Progress: This project focusses on the research question 'How do Socially Disruptive Technologies (SDTs) disrupt concepts and values central to African understandings of what it means to be human?'.

Kristy Claassen, Behnam Taebi, Dominic Lenzi, Elisa Paiusco, Lorina Buhr, Alessio Gerola, Ben Hofbauer, Julia Rijssenbeek. 4. Climate Engineering and the Future of Justice," in: Ibo van de Poel et al. (ed.), Ethics of Socially Disruptive Technologies. An Introduction, 2023, 83–112. https://doi.org/10.11647/obp.0366.04.

Claassen, K. There is no "I" in Postphenomenology. Hum Stud 47, 749–769 (2024). https://doi.org/10.1007/s10746-024-09727-4

The ethics of humanoid robots

Cindy Friedman

Goal: The aim of this PhD project is to investigate the ethics of "humanlikeness" in robots and AI, with a special focus on how this might (re)shape our ideas of our own humanity and especially the moral status of our own humanity.

Progress: The paper "The ethics of replacing human relations with humanoid robots: an ubuntu perspective" was published, arguing that humanoid robots (with which we relate as if they are human) could stunt our moral development should we allow them to replace human beings in the context of inter-personal relationships. In 2023, the paper "Granting negative rights to humanoid robots" was published which challenges those who are sceptical about granting humanoid robots moral status and rights. Work is ongoing to complete the paper "Artefacts of change: three ways in which humanoid robots disrupt our human relational experiences". This paper argues that humanoid robots may disrupt three kinds of human relational experiences: (1) the way in which we relate to technology; (2) the way in which we relate to other people; and (3) the way in which we relate to ourselves. Another paper is in preparation that investigates robot moral status using an approach inspired by African philosophy.

Cindy Friedman. Ethical concerns with replacing human relations with humanoid robots: an ubuntu perspective. AI Ethics 3, 527–538 (2023). https://doi.org/10.1007/s43681-022-00186-0

Cindy Friedman. Granting Negative Rights to Humanoid Robots. Frontiers in Artificial Intelligence and Applications 366 (145-154) 10.3233/FAIA220613. https://ebooks.iospress.nl/doi/10.3233/FAIA220613

Ethics of data-driven mental health diagnostics

Anna van Oosterzee

Goal: This project aims to investigate the following cluster of questions: What ethical concerns are raised by integrating data-driven analytics and translational bioinformatics into psychiatric diagnoses? What implications does the highly personalized character of these computational approaches have for reconceptualizing what is "normal" for human beings? How should these concerns shape these emerging technologies' regulation and ongoing design in this highly contested domain?

Progress: The project explored the question 'Can AI tell us if we are depressed?' and work was done on the problems with low predictive validity in supervised machine learning for psychopathological classifications. This resulted in two conference presentations. In 2023 and 2024, the project was further expanded to evaluate a variety of AI methods, including unsupervised learning and Bayesian networks. This resulted in a collaboration with Washington University St. Louis, and various conference presentations, including an organised symposium at the Philosophy of Science conference 2023. The research from 2022 led to a publication (doi: 10.1007/s00146-024-02012-z), and the project is expected to be finalised at the end of 2025.

Empathy, communication technologies, and neurodiversity

Caroline Bollen

Goal: In this PhD project, a new concept of empathy is being developed that that is inclusive to autistic empathic experiences, and one that can be used to (normatively) reflect on the impact of technology on the way we relate to one another. This is being done on different levels: empathy as a concept in moral theory, empathy as mediated by communication technologies, and the specific case study of empathy as mediated by Augmentative and Alternative Communication (AAC) Technologies.

Progress: The project started with an interdisciplinary systematic review on empathy definitions and methodological operationalizations as used in research on autism and empathy, followed by exploring these in depth and introduction of the phenomenon neurotypical gatekeeping of empathy, arguing for the need to revise the concept and why this needs to be a normative one. Through conceptual engineering, a sketch was developed of such a revised account of empathy, introducing the concepts proximism and distantism, and empathy as the balance between the two. Expanding on this proposal and making use of virtue theory, a more detailed in-depth account of empathy 2.0 was built. Subsequently, framework was developed that can be used to evaluate and design communication technologies (CTs) for empathy, and work was done on applying this framework to a specific subset of CTs: Alternative and Augmentative Communication (AAC) technologies.

Dissertation: Empathy 2.0: What it means to be empathetic in a diverse and digital world (defended in May 2024, Cum Laude)

Bollen, Caroline. (2024) "A conceptual and ethical framework for empathy and communication technologies", Technology in Society

"Design for and with empathy" *The Conference*, Malmö (2023)

Bollen, Caroline. 2023. "Empathy as a Virtue: A Response to Marshall", Social Epistemology Review and Reply Collective

Bollen, Caroline and Colin Marshall. 2024. "Empathy vs. Compassion: A Concluding Discussion", Social Epistemology Review and Reply Collective

Caroline Bollen, A reflective guide on the meaning of empathy in autism research, Methods in Psychology, Volume 8, 2023. https://doi.org/10.1016/j.metip.2022.100109

Bollen, C. (2023). Towards a Clear and Fair Conceptualization of Empathy. Social Epistemology, 37(5), 637-655. https://doi.org/10.1080/02691728.2023.2227963z

National radio interview "Hoe blijven we empathisch in een steeds meer digitale wereld?" *Nacht van NTR Wetenschap (2024)*

Public Talk "Empathie kun je trainen" *Brainwash Festival (2024)*

Interview "Empathie kun je trainen" *Bij Nader Inzien (2024)*

Interview "Liefde staat aan jouw kant" *Trouw (2024)*

The techno politics of the climate movement

Patricia Reyes Benavides

Goal: This research aims to shed light on the co-constitutive relationship between the Internet and the climate movement through a critical re-conceptualization of 'Technopolitics'. The study applies theories stemming from philosophy of technology and political philosophy, as well as empirical methods such as qualitative interviews and autoethnography. This multidisciplinary approach contributes to the ongoing discussion of the political role of digital communication technologies in social movements, and more specifically to how the Internet can disrupt our understanding of climate politics.

Progress: All research activities, including fieldwork have been completed and documented. A full monograph is now being edited for its submission. Apart from the monograph, there are three publications (two co-authored and one single authored). The latter engages closely with the phenomenon of conceptual disruption by studying how digital communication technologies contribute to its users' conceptualization of 'nature.' The co-authored pieces focus on the climate movement, and on social media and democracy.

Reyes Benavides, P.D. Technologically mediated encounters with 'nature'. *Ethics and Information Technology 26*, 51 (2024). https://doi.org/10.1007/s10676-024-09793-3

Reyes Benavides, P.D. and Gertz, N. (2023). Crime without Punishment? On the legitimacy of illegal actions from the climate movement. *Filosofie en Praktijk* 44, 3/4. https://doi.org/10.5117/FEP2023.3/4.004.REYE

Ziliotti, E., Reyes Benavides, P., Gwagwa, A. and Dennis, M., (2023) 'Social Media and Democracy.' in: Ibo van de Poel et al. (ed.), *Ethics of Socially Disruptive Technologies. An Introduction*, 2023, 33–52. https://doi.org/10.11647/OBP.0366.02

Ziliotti, E., Reyes Benavides, P., Gwagwa, A. and Dennis, M., (2023) 'Social Media and Democracy.' in: Ibo van de Poel et al. (ed.), Ethics of Socially Disruptive Technologies. An Introduction, 2023, 33–52. https://doi.org/10.11647/OBP.0366.02

Exploring value experiences through transdisciplinary approaches

Dr. Kathrin Bednar

Goal: The overall aim of the project is to contribute to the developments of new methods and approaches that connect ethical and philosophical investigations with engineering, and the development, testing and employment of new technologies. The project thus contributes to the new approaches objective and to the multi- and transdisciplinarity objective. Most approaches at the intersection of ethics and engineering that have been developed in the past decades focus on the R&D or design phase of new technologies. Often they aim at anticipating potential ethical issues and pro-actively addressing these issues through design or co-creation of new technology. This project will focus on a phase that has received relatively scant attention in the ethics of technology, namely the phase of prototyping and (small-scale) experimentation with new technology.

The more specific objective of this project is developing and trying out approaches and methods from various disciplines, e.g. design or social sciences, for prototyping and small-scale experimentation with new technologies in order to collect and interpret value or moral experiences of users and other stakeholders. The idea is that collecting and interpreting such value experiences is useful, if not crucial, for developing more responsible technologies. More specifically, value experiences (and their interpretation) may be crucial for (1) validating if a proposed design (prototype) indeed respects the values it portrays to respect if a value sensitive design (VSD) approach (or similar) has been followed, (2) discovering new ethical issues that were not anticipated beforehand (and in terms of VSD assessing whether a design meets the right values) (3) tracing potential disruptive effects of new technologies on existing values and moral concepts (which might require rethinking these concepts).

The project comprises two main issues: (1) the philosophical question as to what exactly value (or) moral experiences are, how they are for example different from other experiences, or desires and preferences, and under what conditions they are normatively reliable; (2) the methodological question as to how to empirically collect and interpret value experiences (e.g. through interviews, participant observation, ethnographic methods, VR experiments, etc.). The project wants to contribute to practical methods that can be employed in an engineering or design context.

For this project, we collaborate with the Responsible Sensing Lab (RSL) of the city of Amsterdam and other partners. The envisaged output includes prototypes of responsible smart urban technologies (that are relevant to city of Amsterdam). The idea is to use these prototypes in exploratory empirical studies to try out some of the possible methods for collecting value experiences of users.

Progress: The first project - "Driving for Values": A transdisciplinary design project for a value-driven navigation app that balances individual autonomy with public values has been in collaboration with the RSL and the City of Amsterdam. It began in 2022 and focused on a value-driven navigation app. Starting with September 2023, Kathrin Bednar supported Julia Hermann in representing ESDiT within the project core team. The project aim was to explore how citizens could be motivated to take a "value-based route" that promotes public values such as safety or liveability, instead of taking the fastest route, while respecting their autonomy.

We used a research-through-design approach to investigate this, prototyping different versions of a navigation app and exploring how their features, e.g. the number and type of available routes, affected citizens' experienced sense of autonomy in 18 interviews and one focus group. Findings suggest that the combination of methods from design and social science is useful in exploring value experiences, as the digital prototypes helped to elicit both cognitive assessments as well as emotional reactions in the conducted interviews. Moreover, we gained several insights on transdisciplinary collaborations, such as the benefit of including people that would be affected by a technology already in its design phase, but also challenges connected to different disciplinary assumptions e.g. when discussing a construct such as autonomy, organisational challenges such as differing project durations, as well as the diminishing influence on potential impact beyond the project duration.

Amsterdam Institute for Advanced Metropolitan Solutions (AMS). (2024, November 21). *Aligning traffic with public values is complex–could navigation apps 'nudge' drivers to do better?* [blog post]. https://www.ams-institute.org/news/aligning-traffic-with-public-values-is-complexcould-navigation-apps-nudge-drivers-to-do-better/

Turèl, T., Geiser, F., Hermann, J., Bednar, K., van de Poel, I., IJsselsteijn, W., Dennis, M. J., & Pék, J. (2024). *Driving for Values: An explorative study on acceptance, acceptability and*

autonomy in the context of a navigation aid that promotes public values [report]. https://responsiblesensinglab.org/storage/files/7fb1352b-b0b3-4121-995b-8cb9f13e7aee/Driving-for-Values-Report.pdf

The Future of a Fair & Free Society

Art for climate solidarity

Dr. Aafke Fraaije

Goal: The project examines how the arts can contribute to empathy and solidarity within the climate debate. Specifically, it explores how the arts might help counter affective polarization and including marginalized human voices. While acknowledging the importance of nonhuman voices in this project focuses on the perceived disconnect among people in the present climate conversation.

Progress: In the period 2023-2024, I selected three case studies and initiated the necessary collaborations to investigate these case studies:

1) The KlimaatExpo Muiderslot (2024), a visual art exhibition about climate change in summer 2024 that aimed to exhibit outsider artists and reach new audiences. I conducted empirical research into the curation process, the artists' processes, and visitors' experiences.

2) Your Ancestor (2019) by Nynke Laverman. This case explores maternal perspective on intergenerational justice and their potential to foster (self)compassion in the climate debate. I examined this case through public workshops, an artist interview, and media analysis.

3) Climate ethics education. This case was part of a larger project, COMET 3.0, developing embodied methods to enhance engineering ethics education. I developed and tested new educational formats to help students engage with their climate emotions as valid sources of ethical insight and as bridges toward non-expert perspectives.

These activities laid the groundwork for the project's analytical phase. Beyond these case studies, I learned about conversations about climate change through art by organising and moderating public events, including, for instance, the climate theatrical performance and dialogue *ADEM*, organised by Studium Generale and theater group Vagebond, a dialogue event series called *Climate Grief*, organised by Studium Generale, and dialogues about institutional relationships to the fossil fuel industry at the TU Delft.

Additionally, I co-organised the ESDiT exhibition *Rethinking Ethics – Reimagining Technology* (the University of Twente, 2024), which fostered exchange between artists and philosophers of technology. I also contributed to the public debate through talks and popular publications, of which the highlights include a contribution to Tim Kliphuis' *COSMOS* dialogical climate concert and an essay on the public philosophy platform *Bij Nader Inzien*, titled "What to tell the kids?*".*

de Weger, E., Fraaije, A., Harambam, J., & Willems, W. (2024). Dealing with the Pitfalls of Inclusion and Diversity: How to Involve Citizens Experiencing Distance from and Distrust of Science and Governance. In *Transdisciplinarity for Transformation: Responding to Societal Challenges through Multi-actor, Reflexive Practices* (pp. 347-369). Cham: Springer International Publishing.

Fraaije, A., van der Meij, M., Vermeeren, A., Kupper, F., & Broerse, J. (2023). Creating room for citizen perspectives in 'smart city' Amsterdam through interactive theatre. *Research for*

All, *7*(1).

van der Meij, M. G., Fraaije, A., Broerse, J. E. W., & Kupper, F. (2023). Guiding visions of corporate smart city innovators: Identifying opportunities for participatory futuring. *Futures*, *154*, 103269.

Note: Publications directly based on the project were still in preparation in 2023-2024.

Towards a just implementation of carbon dioxide removal: a capabilities approach

Elisa Paiusco

Goal: This project aims to develop a unique, action-guiding account of intergenerational justice that can be applied to the specific intergenerational issues and assumptions of carbon dioxide removal techniques (CDR). It will also explore the extent to which the specific issues raised by intergenerational justice in climate policy will lead us to revise or create new theoretical understandings of core normative concepts and commitments. To what extent to does adopting an intergenerational perspective require a revision of important distinctions or theories in political philosophy? Similarly, the project will also explore the extent to which our ethical and political concepts may need to be revised in to make them more readily translatable into public policy.

Progress: The project work resulted in a first manuscript entitled "A Capabilities Approach to Carbon Dioxide Removal". It i) sketches how the latest ethical debate has investigated the role of CDR in mitigation pathways compatible with sustainable development; ii) clarifies why a capabilities approach can provide greater conceptual clarity to sustainable development goals' justice demands and can elucidate the role of carbon removal in mitigation; and iii) suggests that capabilities as the metric of justice can be operationalized to design and implement mitigation policies according to whether they secure or harm individual minimal threshold levels of capabilities. A second paper is in preparation, titled "A multispecies justice approach to nature-based carbon dioxide removal". It argues for a closer integration of non-human concerns in environmental ethics.

Electoral technologies and democracy in global perspective

Arthur Gwagwa

Goal: The project seeks to investigate to what extent new electoral technologies necessitate rethinking normative assumptions about the legitimate basis for confidence in electoral outcomes and trust in democratic institutions, particularly in light of two (potentially) disruptive effects of these technologies.

Dissertation: Re-imagining African Unity in a Digitally Interdependent World. https://doi.org/10.33540/2746

Confucianism and ethics of technology

Joseph St. Maria

Goal: This project will use Confucian philosophy as a conceptual resource in answering how people can flourish in a world that is being increasingly proliferated by digital technologies. It will use a Confucian-inspired framework for human flourishing drawn, from the Great Learning, (Da Xue 大學) to organise its inquiry. This framework identifies four spheres of relations that constitute a good or flourishing life. These are the spheres of the "self," the "interpersonal," the "political," and the "world." For each of these spheres, a digital technology shall be investigated. Specifically, an ethical issue about that technology will be explored. The project will then assess the issue through a Confucian lens and propose normative recommendations, aiming to address the issue in a way that enables users to live well in relation to digital technologies, or to attain the "digital good life."

Progress: The project explored how Confucian philosophy can be applied to two issues related to two different digital technologies, which, in turn, influence two distinct spheres of relations. The first issue is that of "McMindfulness," where mindfulness practices are commodified and stripped of their moral framework, thereby reinforcing stressful and inequitable social structures. The digital technology concerned is mindfulness apps. Finally, the sphere of relation involved is that of the self since mindfulness apps promote mindfulness practices targeted at the self. The project explored how resources from Confucian philosophy can be used to design a mindfulness app that can counter McMindfulness by introducing to users a relational and ethical vision of flourishing in which living well is bound up with one's social environment. The findings of the research has been translated into a paper co-authored with Dr. Matthew Dennis. The paper is titled "Countering Digital McMindfulness from a Neo-Confucian Perspective," and is in the process of being reviewed for acceptance in the anthology *The Future of Digital Wellbeing*.
The second issue is that of online political polarization. The digital technology concerned is social media, which, in turn, influences the sphere of the political. The research drew inspiration from Confucian philosophy's implicit conception of cognitive emotions and methods for developing these into moral dispositions, in order to develop design recommendations aimed at mitigating online polarization. The research findings have been translated into a paper co-authored with Dr. Sabine Roeser. The paper is planned to be submitted and published in a journal.

Will democracy survive social media?

Roxanne van der Puil

Goal: Social media platforms have triggered debate about the meaning of democracy. Should their design and regulation better protect freedom of speech? Or should they instead promote democratic deliberation? Answers to these questions (implicitly) convey particular understandings of what 'democracy' means and how it should be applied. This project investigated these debates and the resulting design and regulatory decisions to identify which conceptualizations of democracy are most prominent and which are comparatively marginal. The analysis suggests that epistemic conceptualizations of democracy are more dominant than non-epistemic ones, and that this reliance on epistemic understandings carries both societal and conceptual risks. Overall, the project argues that stronger recognition and influence of non-epistemic conceptualizations in social media design and regulation are necessary to inspire more

diverse solutions, to support aims such as mitigating misinformation and polarization, and to safeguard democracy's status as an essentially contested concept.

van der Puil, Roxanne, Andreas Spahn, and Lambèr Royakkers. "Which Democratic Way to Go?: Using Democracy Theories in Social Media Design," International Journal of Technoethics (IJT) 14, no.1: 1-20. http://doi.org/10.4018/IJT.331800

van Der Puil, R. (2024). A Positive Perspective to Redesign the Online Public Sphere: A Deliberative Democracy Approach. In D. H. De La Iglesia, J. F. De Paz Santana, & A. J. López Rivero (Eds.), *New Trends in Disruptive Technologies, Tech Ethics, and Artificial Intelligence* (Vol. 1459, pp. 307–318). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-66635-3_26

Foundations & Synthesis

Conceptual engineering in the philosophy of technology

Samuela Marchiori

Goal: This project will develop criteria for guiding conceptual engineering projects in the philosophy of technology. It will contribute to three central goals of ESDiT, and of the F&S line in particular. First, it will contribute to the F&S line, by investigating the notion and phenomenon of conceptual disruption and its relation to the philosophy of technology and socially disruptive technologies. Second, the project will contribute by developing new methods and approaches at the intersection of conceptual engineering and the philosophy of technology to address the conceptual challenges raised by socially disruptive technologies. Finally, the project will provide a systematic approach to evaluating the conceptual impact of SDTs.

Progress: The project is divided among two orthogonal lines of research: methods for conceptual engineering and conceptual ethics. In the Academic Year 2023-2024, this led to the following output: (1) the chapter "Conceptual disruption and the ethics of technology" (with J. Hopster, P. Brey, M. Klenk, G. Löhr, B. Lundgren, and K. Scharp), illustrating the role of conceptual disruption in the ethics of technology, has been published in *Ethics of Socially Disruptive Technologies: An Introduction*; (2) the paper "What is conceptual disruption?" (with K. Scharp), investigating the phenomenon of conceptual disruption and its relation to conceptual engineering, has been published in *Ethics and Information Technology*; (3) the paper "Anticipatory gaps challenge the public governance of heritable human genome editing" (with J. Rueda, S. Segers, J. Hopster, K. Kudlek, B. Liedo, and J. Danaher) has been published in the *Journal of Medical Ethics*; (4) the manuscript "Conceptual affordances: (How) should they inform conceptual engineering?", on the role of functions and affordances in conceptual engineering; (5) the manuscript "A social disruptiveness-based approach to AI governance" (with J. Hopster, A. Puzio, M. B. van Riemsdijk, S. Kraaijeveld, B. Lundgren, J. Viehoff, and L. Frank), on the limitations of risk-based approaches to AI governance; (6) two guest lectures at Padua School of Law in the Module "Ethics of the Metaverse: Methodological Foundations", part of the Professional Master's Degree "Metaverse and Legal Informatics"; (7) participation in national and international conferences and workshops.

Hopster, J., Brey, P., Klenk, M. B. O. T., Löhr, G., Marchiori, S., Lundgren, B., & Scharp, K. (2023). Conceptual Disruption and the Ethics of Technology. In L. van de Poel, L. Frank, J. Hermann, J. Hopster, D. Lenzi, S. Nyholm, B. Taebi, & E. Ziliotti (Eds.), *Ethics of Socially Disruptive Technologies: An Introduction* (pp. 141-162). Open Book Publishers.

Marchiori, S., & Scharp, K. (2024). What is conceptual disruption?. *Ethics and Information Technology, 26*(1), 18.

Methods of practical philosophy regarding socially disruptive technologies

Dr. Björn Lundgren

Goal: The aim of this postdoc project is to investigate the following research question: "Which methods in practical philosophy are best suited (and on what grounds) for (1) understanding the normative concerns that are raised by emerging technologies (particularly, their socially and conceptually disruptive character) and for (2) justifying re- vised philosophical approaches to those concerns?"

Progress: The project has developed methodologically oriented research in at least five distinction areas, and contributed to an improved understanding of: (1) some of the major challenges of ethical guidelines—especially for SDTs—as well as potential solutions to those challenges; (2) the alternate accounts of risk and the reasons against non-standard analyses of risk; (3) an insight into the methods in the empirical-normative debate on ethics of crashing and safety of autonomous vehicles; (4) methods in conceptual analysis/design, in particular as it concerns normative-conceptual challenges; and (5) fundamental methodological choices for normative ethics. Most of the results are found in the below papers:

Lundgren, Björn. "Is a Moral Right to Privacy Limited by Agents' Lack of Epistemic Control?." Logos & Episteme 15.1 (2024): 83-87.

Andreotta, A. J., & Lundgren, B. (2024). Automated informed consent. *Big Data & Society*, *11*(4). https://doi.org/10.1177/20539517241289439 (Original work published 2024)

Lundgren, Björn, and Karolina Kudlek. "What we owe (to) the present: Normative and practical challenges for strong longtermism." Futures 164 (2024): 103471.

Lundgren, B. Undisruptable or stable concepts: can we design concepts that can avoid conceptual disruption, normative critique, and counterexamples?. *Ethics Inf Technol* 26, 33 (2024). https://doi.org/10.1007/s10676-024-09767-5

Lundgren, B. In defense of ethical guidelines. *AI Ethics* 3, 1013–1020 (2023). https://doi.org/10.1007/s43681-022-00244-7

Björn Lundgren, "Two notes on Axiological Futurism: The importance of disagreement and methodological implications for value theory", Futures 147: 103-123 (2023). https://doi.org/10.1016/j.futures.2023.103120.

Hopster, J., Brey, P., Klenk, M. B. O. T., Löhr, G., Marchiori, S., Lundgren, B., & Scharp, K. (2023). Conceptual Disruption and the Ethics of Technology. In L. van de Poel, L. Frank, J. Hermann, J. Hopster, D. Lenzi, S. Nyholm, B. Taebi, & E. Ziliotti (Eds.), Ethics of Socially Disruptive Technologies: An Introduction (pp. 141-162). Open Book Publishers. https://doi.org/10.11647/ OBP.0366.06

Lundgren, Björn, 'Ethical Requirements for Digital Systems for Contact Tracing in Pandemics: A Solution to the Contextual Limits of Ethical Guidelines', in Kevin Macnish, and Adam Henschke (eds), The Ethics of Surveillance in Times of Emergency (Oxford, 2023; online edn, Oxford Academic, 23 Nov. 2023), https://doi.org/10.1093/oso/9780192864918.003.0011

Lundgren, B. Is Lack of Literature Engagement a Reason for Rejecting a Paper in Philosophy?. Res Publica (2023). https://doi.org/10.1007/s11158-023-09632-0

Lundgren, B., Stefánsson, H.O. Can the Normic de minimis Expected Utility Theory save the de

minimis Principle?. Erkenn (2023). https://doi.org/10.1007/s10670-023-00751-x

Socially disruptive technologies and conceptual change

Dr. Guido Löhr

Goal: The aim of this project is to understand the nature of conceptual disruption and conceptual change in the context of socially disruptive technologies.

Progress: I have published several papers in 2023 on this topic:

Conceptual Disruption and the Ethics of Technology In: van de Poel, Ibo, et al. (eds.). Ethics of Socially Disruptive Technologies: An Introduction. *Open Book Publishers*. (with Marchiori, et al.)

Who owns 'Nature'? Conceptual Appropriation in Discourses on Climate- and Biotechnologies. *Environmental Values.* (with Hopster, et al.)

Conceptual disruption and 21st century technologies: A framework. *Technology in Society.* Volume 74, 102327

Do socially disruptive technologies really change our concepts or just our conceptions? *Technology in Society.* Volume 72, 102160.

The role of conceptual schemes and technology-induced conceptual change in techno-moral change

Robin Hillenbrink

Goal: The aim of this project is to develop a theoretical framework concerning the mechanisms with which technologies induce conceptual disruptions and changes in moral conceptual schemes, and to clarify the role of these schemes and changes in them in processes of techno-moral change. The theory is to be validated and further developed by applying it to a set of case studies of conceptual disruption and change, such as changes in conceptual schemes regarding consent and other biomedical concepts. The theoretical framework draws from historical case studies, as from theories in philosophy of technology, philosophy of language, and theories of conceptual disruption, change, and conceptual engineering as developed amongst others in the ESDiT project in previous research. Furthermore, it focuses on the underlit shaping role of concepts in discourse on techno-moral change and moral revolutions. The key research question for the project is: What is the role of conceptual schemes and SDT-induced conceptual changes in techno-moral change?

Improving ethical analysis through better conceptualization of the moral role of technological products and systems

Haizea Escribano

Goal: This project investigates how we can conceptualise the moral role of technological products in morally evaluable acts and events, and how this conceptualisation can facilitate the development of a refined methodological approach to assess the moral impact of technological artefacts and systems. The focus is not just on single technological products with single users, but also on larger systems with multiple technological components and human operators. These include both sociotechnical systems – predominantly technical systems with human operators and enablers, such as an electricity networks, industrial production systems and the internet, and technosocial systems – predominantly social systems that rely on technology, such as modern organisations and associations.

The PhD candidate will investigate the different causal and moral roles that technology can take in morally consequential actions and events involving technologies with single users, autonomous technologies, and sociotechnical and technosocial systems. She will do so, initially, by studying, systematising and critiquing approaches in the literature that assigns technological artefacts and systems a moral role. These approaches will not only be distinctly ethical, but also include positions from a wider range of non-philosophical disciplines such as STS, political theory and cognitive psychology. The possibility of translating these non-philosophical approaches to ethics will ground their moral evaluability and thus their relevance to the project. Once properly studied and systematised, the extant moral roles assigned to technology will be evaluated according to their ethical, ontological, and methodological foundations. The systematisation and assessment of these moral roles will develop a new vocabulary that will aid the formulation of a new quantitative method. This method will be especially tailored to evaluate technological products and systems in complex network arrangements where human and artefactual entities are deeply interlaced and bound by a myriad of causal chains. The purpose of this method will be to understand the workings of these networks, as well as to assess their moral consequences in a way that is efficient and quantifiable. The developed methodology will mostly be applied to socially disruptive technologies: technologies that transform everyday life, social institutions, cultural practices, and potentially even fundamental beliefs and values.

Social and ethical dimensions of content generation technologies

Kaush Kalidindi

Goal: The project examines the ethical and social dimensions of Generative AI systems with a focus on artistic and epistemic practices as they are lived by real individuals and, crucially, by artistic and technical communities. For Sep 2023–Aug 2024 the concrete aim was to complete a writing sample and a research proposal for

the 9-month qualification at TU/e; for Aug–Dec 2024, to begin a new research paper.

Progress: The project investigates how GenAI disrupts artistic and technical communities. The first paper (writing sample), "Beyond the Generated Outcome: The Need for a Process-based Validation of Generative AI Systems," distinguishes GenAI from other ML and technical systems and argues that validation should assess not only outputs but also the generative process, highlighting how commercial development has allowed GenAI to evade the stringent standards often applied to ML in scientific and decision-making contexts. From Aug–Dec 2024, a second paper developed the notion of Technical Expression to characterize the distinct human–technology relationship particular to artists, tinkerers, and DIY communities. Differentiating technical expression from artistic expression allowed me bring to surface the active role that the technical medium in creatives and epistemic practices, setting the stage for a later analysis of GenAI as medium. This paper was submitted at the end of the year for the SPT Graduate Paper Award.

Management Reports

Reports from the Management

Prof. Dr. Philip Brey

Socially disruptive technologies. My research in 2022-2023 has focused on programme-specific research questions, namely RQ2: Understanding conceptual disruption and RQ3: Developing new approaches for ethical assessment and guidance of socially disruptive technologies. I also contributed to RQ1: Understanding the disruptive effects of 21st century disruptive technologies and RQ4: Developing new models of multi- and transdisciplinary research. The technologies I focus on are digital technologies, especially AI and extended reality. To a lesser extent, I also study medical technologies.

In relation to RQ2, I co-authored an article on conceptual disruption and the ethics of technology for the 2023 ESDiT book and wrote and submitted an article on conceptual disruption and engineering of ethical concepts. I have also given presentations on this topic, have been leader and advisor of research lines that focus on conceptual disruption, and have been supervising Robin Hillenbrink's PhD thesis on this topic. In relation to RQ3, I have been working on a structural ethics approach to ethical analysis, have co-published on a new approach for analysing issues of power and justice in technology, have published an article of the disruptive effects of technology on cognitive and motor function and am supervising a dissertation by Haizea Escribano which develops new approaches of ethical analysis of disruptive technologies. I have also been leader and advisor of research lines that focus on new methods.

In relation to RQ4, I have published an article that defines an Ethics by Design approach for AI. In relation to RQ1, I have published on the disruptive effects of neurotechnology, human enhancement and mhealth apps, and have been preparing a book on extended reality and the metaverse.

Brey, P. and Dainow, B. (2023). Ethics by Design for Artificial Intelligence. AI and Ethics. https://doi.org/10.1007/s43681-023-00330-4

Dr. Andreas Spahn

Will democracy survive social media? This project includes the research questions 1) How can we better align social media with human values and how can we re-interpret democratic values (e.g. deliberation, the role of public sphere)? 2) How do socially disruptive technologies relate to human values, particularly in the field of behaviour change and environmental values?

I have been involved in the funded research projects and the co-supervision of Roxanne vd Puil (current) on democracy and social media. I am also active in the intercultural philosophy track and the reading groups of this track and helped organise a session on intercultural philosophy for the PhD Course on intercultural philosophy.

Next to this I have continued to work behaviour change technologies for environmental goals and prepared an edited volume to appear in 2025 together with Lily Frank and Joel Anderson on the Ethics of behaviour change technologies

(for which I have also contributed a chapter). I have published with colleagues on the use of behaviour change technologies for environmental goals and for crow-management.

Bombaerts, G., Anderson, J., Dennis, M., Gerola, A., Frank, L., Hannes, T., ... & Spahn, A. (2023). Attention as practice: Buddhist ethics responses to persuasive technologies. *Global Philosophy*, *33*(2), 25.

Laes, E., Bombaerts, G., & Spahn, A. (2023). Towards a pragmatic and pluralist framework for energy justice. *Philosophy & Technology*, *36*(3), 53.

Bal, M., Stok, M., Bombaerts, G., Huijts, N., Schneider, P., Spahn, A., & Buskens, V. (2023). A fairway to fairness: Toward a richer conceptualization of fairness perceptions for just energy transitions. *Energy Research & Social Science*, *103*, 103213.

Bombaerts, G., Spahn, A., & Laes, E. (2023). Structuring values and normative frameworks using Schwartz's value theory to map the three tenets of energy justice. *Energy Research & Social Science*, *104*, 103244.

Dameski, A., Spahn, A., Pouw, C. A., Kodapanakkal, R., Haans, A., Corbetta, A., ... & Bombaerts, G. (2024). System-phenomenology: The empirical case for collectives in mediation theory. *Journal of Human-Technology Relations*, *2*, 1-22.

Prof. Dr. Ibo van der Poel

The potential of living labs for the ethics of technology: Developing new empirical and philosophical methods. Related research questions are: 1) How are conceptual change and value change related? (This builds on insights from my ERC project on value change), 2) How should we conceptually engineer the concept of 'control' particularly given the role the concept of 'control' has in discussions about control over technology (e.g. AI), control over nature (environmental philosophy, geo-engineering) and the relation between control and responsibility, 3) How can methods like corpus analysis and topic modelling be used to investigate conceptual change over time? 4) What role can and should 'value experiences' play in the responsible development of new technology and particularly in design for values? How should we philosophically understand values experiences? What new empirical methods can be developed to collect and interpret relevant value experiences?

Through 2023 and 2024, I acted as main editor for the ESDiT book, worked on concept of "control", participated in a transdisciplinary design project with Responsible sensing lab working on design for values, contributing to new methods particularly in relation to value experiences, and explored the relations between conceptual disruption/change and value change (publications are part of my ERC project).

I was also involved in the following projects (as supervisor): 1) Conceptual engineering in the philosophy of technology [2022-2026], with Samuela Marchiori (PhD candidate) and Michael Klenk (daily supervisor), 2) Governance of geoengineering in the face of normative uncertainties [2020-2024], with Benjamin Hofbauer (PhD candidate), Benham Taebi and Udo Pesch (co-supervisors), and 3) The potential of living labs for the ethics of technology: developing new empirical and philosophical methods with Kathrin Bednar (postdoc), Julia Hermann and Wijnand IJsselsteijn (co-supervisor).

Van de Poel, I., Frank, L. E., Hermann, J., Hopster, J., Lenzi, D., Nyholm, S., Taebi, B., & Ziliotti, E. (Eds.). (2023). *Ethics of Socially Disruptive Technologies: An Introduction*. Open Book Publishers. https://doi.org/https://doi.org/10.11647/OBP.0366.

van de Poel, I. (2023). AI, Control and Unintended Consequences: The Need for Meta-Values. In A. Fritzsche & A. Santa-María (Eds.), Rethinking Technology and Engineering: Dialogues Across Disciplines and Geographies (pp. 117-129). Springer International Publishing. https://doi.org/10.1007/978-3-031-25233-4_9

Van de Poel, I., & Sand, M. (2023). Responsibility beyond control. In A. Placani & S. Broadhead (Eds.), *Risk and Responsibility in Context* (pp. 31-50). Routledge. https://doi.org/10.4324/9781003276029-3

Dizani, A., Ghorbani, A., Taebi, B., & van de Poel, I. (2024). Understanding engineering ethics in countries: Towards an analytical framework. *Technology in society*, *77*, 102517. https://doi.org/10.1016/j.techsoc.2024.102517

Ozkaramanli, D., Smits, M., Harbers, M., Ferri, G., Nagenborg, M., & Van de Poel, I. (2024). Navigating ethics-informed methods at the intersection of design and philosophy of technology. DRS2024: Boston, 23–28 June 2024, Boston, USA. *Report*

Turèl, T., Geiser, F., Hermann, J., Bednar, K., Van de Poel, I. , IJsselsteijn, W., Dennis, M. J., & Pék, J. (2024). *Driving for Values. An explorative study on acceptance, acceptability and autonomy in the context of a navigation aid that promotes public values.* https://responsiblesensinglab.org/storage/files/7fb1352b-b0b3-4121-995b-8cb9f13e7aee/Driving-for-Values-Report.pdf

Prof. Dr. Joel Anderson

Reconfigurations of the human research topic: Methods of ethics and defining "socially disruptive technologies". This is related to the project on Methods of Ethics for Socially Disruptive Technologies.

Joel Anderson, Jeroen Hopster & Björn Lundgren, Defining Socially Disruptive Technologies, 4TU.Ethics – ESDiT Conference 2024 (October 4, 2024)

Research topic: Data-driven approaches to mental health diagnosis. My role in the project with Sander Werkhoven and Anna van Oosterzee (also relevant to the WHE line) has been to develop, with Sander, the ethical framework for understanding the impact of mental health labels, as that is relevant to understanding how the technology of data-driven approaches should be evaluated.

Werkhoven, S, JH Anderson, and IAM Robeyns. "Who Benefits From Diagnostic Labels for Developmental Disorders?" In Ethics and Philosophy of Neurodevelopmental Conditions (Special Issue of "Developmental Medicine & Child Neurology"), edited by Leni Van Goidsenhoven, and Kristien Hens. 2023.

Presentation, "The Ethics of Mental Health Diagnostic Labels & Challenges of Data-Driven Approaches" (at a panel I organised on "Implications of Data-Driven and Precision Psychiatry for the Ethics of Mental Health Classifications" at the The Hastings Center (Hastings, NY) (November 1, 2023)

Research topic: Technologically mediated self-control, procrastination & the extended will. Central to my contribution to the Human Condition line is a focus on developing an account of autonomy that can (critically) accommodate ways in which technology can support or enhance autonomy. During these two years, I developed my account in ways that highlight the impact on justice and

exclusion.

Presentation: "Assistive Technologies for Self-Control in the Context of Structural Attributional Injustice", Ethics Centre, U of Toronto, September 20, 2023

Presentation: "Towards a Critical Theory of Competence: Attributional Injustice, Responsibilization of Self-Control, and Assistive Technologies," Critical Theory Roundtable 30 (Santa Cruz, USA; November 3, 2023)

Research topic: Reconceptualizing "autonomy" in the context of technological supports. Central to my contribution to the Human Condition line is a focus on developing an account of autonomy that can (critically) accommodate ways in which technology can support or enhance autonomy.

Presentation: "The Normative Implications of Structurally Supported Autonomy," Centre for Political Philosophy invited lecture, May 25, 2023

Presentation: "Structural Supports for Self-Regulation as a Component of Autonomy," Workshop on "Models and Measures for Autonomous Agency" (Utrecht University), May 26, 2023

The Structures Required for the Autonomy We Need. Inaugural Lecture, chair in Moral Psychology & Social Philosophy, Utrecht University. May 8, 2023.

Presentation: "Attributional Justice, Resilient Resistance, and Recognition Supports: Extending Catriona Mackenzie's Three-Dimensional Account of Autonomy for Critical Social Theory," OZSW Conference (August 31, 2024)

Research topic: Persuasive technologies, attention economy, and e-coaching. With the working group on Buddhism and Technologies of the Attention Economy, I developed an account of an alternative framing of the dangers of the distracting technologies. Building on earlier work with Bart Kamphorst, I articulated an evaluative framework for e-coaching technologies that corrects a neglect in the literature regarding social justice concerns.

Bombaerts, Gunter, Joel Anderson, Matthew Dennis et al. "Attention as Practice. Buddhist Ethics Responses to Persuasive Technologies." *Global Philosophy* 33, no. 2 (2023): 8, https://doi.org/10.1007/s10516-023-09680-4.

Kamphorst, B. A., and J. H. Anderson. "E-Coaching Systems and Social Justice: Ethical Concerns About Inequality, Coercion, and Stigmatization." *AI and Ethics* (2024): https://doi.org/10.1007/s43681-024-00424-7.

Dr. Julia Hermann

Exploring the relationship between technology-induced conceptual disruption and the phenomenon of deep disagreement. I completed a paper in which I connect the literature on deep disagreement to the discussion about socially disruptive technologies and conceptual disruption and analysed the relationships between the concepts of certainty, deep disagreement and deep disruption.

"Moral Progress through Conceptual Disruption and Deep Disagreement", talk at the ESDiT and 4TU.Ethics Conference Rethinking Ethics – Reimagining Technology, University of Twente, 2-4 October 2024

Julia Hermann (2025), "Moral Certainty, Deep Disagreement, and Disruption", Synthese 205(103). (This paper was published in 2025 but is the result of work done in 2024.)

The disruptive potential of the artificial womb. I continued working on a paper co-authored with Naomi Jacobs and Lily Frank on the disruption of the concept of mother and related concepts and completed the chapter for the ESDiT book as one of the lead authors. I moreover produced the following output:

"Farewell to Mothers? Artificial wombs and the future of human reproduction", presentation at the Emerging Technologies & Societal Transformations Research Theme conference, University of Twente, 21 September 2023 (together with Naomi Jacobs)

Podcast on ectogestative technology, The Dissenter, released on 4 November 2024, available here.

"The Disruption of Human Reproduction", post published on the blog Justice Everywhere, 20 May 2024

Lily Eva Frank, Julia Hermann, Llona Kavege & Anna Puzio (2023), "Ectogestative Technology and the Beginning of Life", in: Ibo van de Poel et al., Ethics of Socially Disruptive Technologies: An Introduction, Open Book Publishers, pp. 113-140.

Autonomy and smart mobility. In late 2023, we conducted the interviews and a focus group for this study. Based on a first analysis of the data and insights gained during the project as a whole, in 2024, we formulated recommendations for the design and implementation of a value-based navigation app and wrote a report for the municipality of Amsterdam. Master's students from the University of Twente checked and translated the interview transcripts and we started with the in-depths thematic analysis of the interviews. In the fall of 2024, we submitted an academic paper for the CHI-conference.

"Driving for Values: How App Design Influences Drivers' Experience of Autonomy", Workshop on Value Experience, Social Impact Factory Utrecht, 14 February 2024 (invited talk)

"Driving for Values", post published on the blog Justice Everywhere, 12 February 2024

Thijs Turèl, Fabian Geiser, Julia Hermann, Kathrin Bednar, Ibo van de Poel, Wijnand Ijsselsteijn, Matthew J. Dennis, and Jop Pék (2024), Driving for Values: An Explorative Study on Acceptance, Acceptability and Autonomy in the context of a Navigation Aid that Promotes Public Values, Report for the Municipality of Amsterdam.

The benefits and hurdles of transdisciplinary research collaborations and how to develop a new methodology for transdisciplinary research drawing on philosophy and art. I was invited as a participant in the Werkconferentie Kunst-Wetenschap-Samenleving, KNAW, in Amsterdam, in June 2024 and curated an ESDiT-exhibition at Vrijhof, University of Twente, from October to December 2024 together with Aafke Fraaije and Kaush Kalidindi. Other endeavours in this space include:

"Enhancing Transdisciplinary Research Through Philosophy and Design", talk given at the workshop Transforming Science, Centre for Logic and Philosophy of Science, University of Ghent, 24 April 2024

Chair of a panel on transdisciplinary collaborations, ESDiT and 4TU.Ethics Conference Rethinking Ethics – Reimagining Technology, University of Twente, 2-4 October 2024.

"A narrative and art-based approach for the anticipatory imagination of moral issues related to nature-technology relationships", experimental session at the Anticipation 2024 conference, Lancaster University, 11-14 September 2024

"Shaping Responsible Futures Through Transdisciplinary Approaches", Opening Keynote of the ELSA-NN Symposium 2024 Responsible AI Innovation is a Joint Effort, Art Academy Minerva, Groningen, 24 October 2024 (in Dutch).

Invited speaker in a panel on the value of embodied and performative approaches in design and research, Symposium "Blurring the Boundaries: Reflecting on Artistic-Led Research on Designing Human-Technology Entanglements", 11 December 2024, University of Twente.

Gaston Remmers, Julia Hermann, Egbert Siebrand & Catharina M. van Leersum (2023), "Mind the Relationship: A Multi-Layered Ethical Framework for Citizen Science in Health", Etica & Politica / Ethics & Politics XXV(2): 171-196.

Prof. Dr. Sabine Roeser

Rethinking the concepts of risk, emotion, intuitions and art in the light of SDTs. In my research I argue that the concept of risk has to be redefined from a quantitative notion to explicitly include ethical aspects such as autonomy, fairness, solidarity, responsibility, and care. I furthermore argue that we need to reconceptualize emotions (including empathy, compassion and care), namely not as states that are contrary to rationality as they are often seen, but as a form of moral cognition and perception that can alert us to these ethical aspects of risk. Furthermore, I argue that works of art that engage with technologies can contribute to emotional moral deliberation on risky technologies; this requires reconceptualizing art from 'l'art pur l'art' as 'art as a scaffolding for emotional deliberation' by experientially engaging our imaginative capacities. Lots of papers are in the pipeline, some just got published after long reviews. I am finalizing a monograph on emotions, technology and art.

Sabine Roeser (2024), invited blog post https://www.beste-id.nl/nieuws/filosofen-en-kunstenaars-kunnen-bijdragen-aan-het-nadenken-over-klimaatsolidariteit

Janna van Grunsven and Sabine Roeser. (2024) 'Participatory Sense-Making as a Route towards 'Genuine Empathy': A Response to Dinishak's Reply', Social Epistemology Review and Reply Collective 13 (10), 8-19

Sabine Roeser and Steffen Steinert (2023), 'Emotions and Responsible Innovation of Risky Technologies', in Stearns Broadhead and Adriana Placani, Risk and Responsibility in Context, London: Routledge pp. 173-190

Janna Van Grunsven, Lavinia Marin, Taylor Stone, Sabine Roeser, Neelke Doorn (2023) 'How Engineers Can Care from a Distance', in Glen Miller, Helena Mateus Jerónimo, Qin Zhu (eds.), Thinking Through Science and Technology: Philosophy, Religion, and Politics in an Engineered World, Rowman and Littlefield pp. 141-163

Prof. Dr. Marcel Verweij

Technology for public health and solidarity as ground for assessing health technologies. The related research questions are: 1) Technology for public health: How can public health authorities or the state implement technologies to improve public health (notably as infectious disease control) in a responsible way? 2) What are the ethical grounds for deciding about the inclusion or exclusion of health care technologies in the basic health insurance package, and what is the role of the value of solidarity in this?

In the past years Roland Pierik and I have developed an ethical justification for

proportionate mandatory vaccination policies, both in childhood vaccination and in pandemic policies. We have explained how the harm principle can offer such a justification, and we have developed a framework for proportionate state pressure or coercion. The results have played a significant role in Dutch societal debates about pandemic vaccination and childhood vaccination.
As part of this study we also developed a framework for trustworthy immunization policies, which has also played a role in the debate about government activities to influence social media algorithms with the aim to downplay misinformation. Our book *Inducing Immunity?* was published by MITPress in 2024.

As part of my work for the Adviescommissie Pakket of Zorginstituut Nederland, I have done research on exploring the idea whether the value concept of solidarity can be un- derstood in such a way that it gives reason to prioritise health care technologies that are environmentally sustainable. The result is an explanation of how solidarity functions as an ideal concept that offers ground for taking seriously (in national health policies) the climate impact of our own health care. Another theme in which values like solidarity and justice were central concerned the impact of novel weightloss medicines like semglutide.

Roland Pierik, Marcel Verweij. *Inducing Immunity? Justifying Collective Immunization Policies in Times of Vaccine Hesitancy*. MITpress, 2024 (open acces) https://doi.org/10.7551/mitpress/15307.001.0001

Marcel Verweij, Roland Pierik. Overheid, zorg voor een betrouwbaar vaccinatiebeleid! *Trouw* 29 maart 2024.

Marcel Verweij & Marcel Canoy. Obesitas als structureel onrecht. Een radicaal ander sociaal contract voor een gezondere samenleving. Nederlands Tijdschrift voor Geneeskunde 2024;168:D8242. https://www.ntvg.nl/D8242

Verweij, M., Ossebaard, H. Sustainability as an Intrinsic Moral Concern for Solidaristic Health Care. Health Care Anal 2024;32:261–271. https://doi.org/10.1007/s10728-023-00469-5

Prof. Dr. Wijnand IJsselsteyn

Cognition and affect in human-technology interaction. An active research program on the impact of media technology on human psychology, and the use of psychology to improve technology design. Related topics are: 1) Emerging technologies and the moral character of the human being. 2) Brain-computer interfaces & the disruption of the concept of personhood, 3)Behaviour change technologies for moral improvement and 4) Qualitative investigation of Interdisciplinary (STEM) & Transdisciplinary Perspectives.

Together with Koert van Mensvoort (Next.Nature), I organised the AI for ALL event at the Evoluon in Eindhoven - a collaboration in which ESDiT was also visibly present. Speakers here included Bruce Sterling and Marleen Stikker. See: https://www.tue.nl/en/our-university/calendar-and-events/25-11-2022-ai-for-all-from-the-dark- side-to-the-light

My personal highlight of last year was probably the award of the Distinguished NIAS Lorentz Fellowship 2024/2025 on the theme Psychology and Ethics Of Progressively Lifelike Embodiments in the Metaverse (PEOPLE in the Metaverse) (https://nias.knaw. nl/news /wijnand-ijsselsteijn-selected-as-distinguished-nias-lorentz-fellow-2024-25/)

Prof. Dr. Vincent Blok

Philosophy of technology in the digital age. In my research, I am interested in the ontological impact of disruptive technologies on the structure of the World and the way humans live and act in the world, as well as the contribution of concrete cases of digital technologies like AI & Digital Twins that impact the structure of the world. I focus on three general research questions: 1) How do digital technologies impact the structure of the world and human living and acting in the world? 2) What is the nature of creation involved in technological innovation? 3) How to conceive the ontological impact of digital technologies on the world beyond anthropocentrism and determinism?

After initial publications in these areas that set the stage in the period before 2023, in which I developed a philosophy of innovation, I published several articles in the period 2023-2024 that contribute to these three research questions. These individual contributions will be integrated into 3 books.

Blok, V. (2024) "Ecological Hermeneutic Phenomenology as Method to Research the Ontic and Ontological Structure of Technologies in the World". In: B. de Boer & J. Zwier (Eds.) Phenomenology and philosophy of technology. Openbook Publishers: 27-51

Blok, V. (2024) "Earth and the Ontology of Planets". Garasic, M.D., Di Paola, M. (Eds.), The Philosophy of Outer Space. Explorations, Controversies, Speculations, pp. 41-55

Blok, V. (2024) "Materiality versus Metabolism in the Hybrid World: towards a Dualist Concept of Materialism as Limit of Post-humanism in the Technical Era". Philosophy and Technology 37(60): doi.org/10.1007/s13347-024-00751-x

Blok, V. (2024) "Tecnología como Mimesis: biomimética como Diseño, Ingeniería y Tecnología Regenerativa y Sostenible". Journal of Biomimicry, 8.

Blok, V. (2023) Philosophy of technology in the digital age: the datafication of the world, the homo virtualis, and the capacity of technological innovations to set the World free. Wageningen: Wageningen University.

Blok, V. (2023) "The ontology of technology beyond anthropocentrism and determinism. The role of technologies in the constitution of the (post)Anthropocene World". Foundations of Science 28: pp 987–1005

Blok, V. (2023) "The Earth means the World to me: Earth- and World-interest in times of climate change". Di paola, M., Pellegrino, G. (Eds.), Handbook of Philosophy of Climate Change (doi.org/10.1007/978-3-030-16960-2_105-1)

Blok, V. (2023) "The Normative and Social Dimension of the Transition Toward a Circular Biobased Economy", S. Lamalle, P. Stoet (Eds.) Representations and Rights of the Environment. Cambridge: Cambridge UP, 134-150

Bosschaert, M., Blok, V. (2023) "The 'empirical' in the empirical turn: a critical analysis". - Foundations of science. 28: pp. 783–804

Gerola, A., Robaey, Z., Blok, V. (2023) "What does it mean to mimic nature? A typology for biomimetic design", Philosophy & Technology (doi, 10.1007/s13347-023-00665-0)

Holy-Luczai, M., Blok, V. (2023) "Towards the Phenomenology of Hybrids as Regenerative Design and Use -A Post-Heideggerian Account", Environmental Values 32(4): 469-491

Schomberg, L. von, Blok, V. (2023) “It takes two to tango: Toward a Political Concept of Responsible Innovation”, Journal of Responsible Innovation (doi.org/10.1080/23299460.2023.2264616)

Veraart, R., Blok, V., Lemmens, P. (2023) “Ecomodernism and the Libidinal Economy: Towards a Critical Conception of Technology in the Bio-Based Economy”, Philosophy & Technology. doi.org/10.1007/s13347-023-00617-8

Financial Overview

Personnel (in fte and K€) and other costs (in K€)

Scientific staff	FTE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
PhD students	14,3	15,8	393,0	767,3	860,4	914,5	538,6	884,8	884,8	728,9	382,7	6371,0
Postdocs	7,9	60,6	184,0	337,0	482,8	113,6	312,4	559,2	758,4	758,4	473,9	4040,5
Tenure trackers	3,4	15,5	56,5	56,5	66,3	445,2	335,3	335,3	335,3	335,3	335,3	2316,7
Replacements (Prof.)	1,3	126,8	120,3	140,1	175,6	196,2	294,8	301,9	309,2	316,6	324,2	2305,7
Total scientific staff	26,9	218,7	753,8	1300,9	1585,1	1669,5	1481,2	2081,3	2287,8	2139,3	1516,2	15033,9

Non-Scientific staff	FTE	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Academic level	0,9	66,1	85,2	85,2	76,9	75,6	99,3	101,2	103,2	105,2	107,2	904,9
MBO level	0,8	48,7	49,8	50,9	52,1	50,5	48,2	49,2	50,3	51,4	52,6	503,5
Total non-scientific staff	1,7	114,8	135,0	136,1	129,0	126,1	147,4	150,3	153,4	156,5	159,7	1408,4

Total staff	28,6	333,5	888,8	1437,0	1714,0	1795,7	1628,6	2231,6	2441,2	2295,8	1675,9	16.442,3

Description	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Total
Open science infrastructure	0,0	0,0	0,0	0,0	0,0	7,2	7,2	7,2	7,2	7,2	36,0
Advisory board expenses	0,0	0,0	0,0	0,0	5,3	28,9	28,9	28,9	28,9	28,9	150,0
Travel/conference organization	4,5	18,9	67,1	106,2	85,4	155,6	155,6	155,6	155,6	155,6	1060,3
Dissemination, valorization	0,0	9,1	15,9	24,1	17,7	36,6	36,6	36,6	36,6	36,6	250,0
PhD Abroad program	0,0	0,0	3,6	24,7	48,2	40,7	40,7	40,7	40,7	40,7	280,0
Strengthening living labs	0,0	0,0	0,0	0,0	24,2	35,2	35,2	35,2	35,2	35,2	200,0
Total other staff	4,5	28,0	86,6	155,0	180,8	304,3	304,3	304,3	304,3	304,3	1976,3

Management Team

	Role
Philip Brey	*Programme leader*
Wendy Aartsen	*Programme manager*
Seeta Autar	*Project manager*

All research fellows involved in the programme's output are mentioned on the website:

https://www.esdit.nl/about-esdit/researchers/

All publications are available at:

https://www.esdit.nl/publications/

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