This document provides short introductions to the mandatory literature for the course. It also provides links to secondary literature, articles, and documentaries, that are also relevant. So if you want to read more on a topic, you can start with them.

PART A – INTRODUCTION DESIGN, TECHNOLOGY, SOCIETY

Feb. 5: Course Compass

These two articles give direction and context to the course. The article by Kate Raworth is about the doughnut, a framework consisting of nine planetary boundaries (critical natural thresholds) and twelve aspects of social foundation (critical human deprivations) for thriving human life. The space between the planetary boundaries and the social foundation is called the safe and just space for humanity. Our challenge is: How can the production, use, and end of life of the technologies we design, develop, use, and promote contribute to staying within the doughnut? The second reading for this session is a (comic) strip about resisting an automated future and presents a bit of history about people resisting new technology. This strip presents some examples of issues we will further explore in this course. This doesn't mean that you need to agree with the strip – or everything you will read, see, or hear in this course. This course is not meant to tell you what to think or how to do things. The main objective of the course is to develop your critical thinking and to learn how to ask questions that enable you to do research and work that moves us towards more sustainable and just futures.

1. **Raworth, Kate (2017). A Doughnut for the Anthropocene: Humanity's compass in the 21st century. *The Lancet Planetary Health*, 1(2), e48–e49. https://doi.org/10.1016/S2542-5196(17)30028-1**

2. **Humberstone, Tom (2023). I am a Luddite (and So Can You!) https://thenib.com/im-a-luddite/**

Secondary literature:

o Stockholm Resilience Centre (2024)
https://www.stockholmresilience.org/research/planetary-boundaries.html024)Leach,
o M., Raworth, K., & Rockström, J. (2013). Between social and planetary boundaries: Navigating pathways in the safe and just pathway for humanity. In ISSC & UNESCO (Eds.), *World Social Science Report 2013: Changing Global Environments* (pp. 84–90). UNESCO. https://doi.org/10.1787/9789264203419-en

- o Raworth, K. (2017a). *Doughnut Economics: Seven Ways to Think Like a 21st-Century Economist*. Chelsea Green Publishing.
- o Steffen, W. et al. (2015). Planetary boundaries: Guiding human development on a changing planet. *Science*, *347*(6223), 1259855. https://doi.org/10.1126/science.1259855

Course & Exam (why you have an oral exam):

- o Liang et al. (2023). GPT detectors are biased against non-native English writers. In: Patterns 4(7), 100779. Online: https://www.cell.com/patterns/fulltext/S2666-3899(23)00130-7?
- o Pirrone, Angelo (2023). Resist AI by Rethinking Assessment. Online: https://blogs.lse.ac.uk/highereducation/2023/03/23/resist-ai-by-rethinking-assessment/
- o van der Velden, Maja (2021). 'I felt a new connection between my fingers and brain': a thematic analysis of student reflections on the use of pen and paper during lectures. *Teaching in Higher Education*. https://doi.org/10.1080/13562517.2020.1863347

Feb. 12: Theory of technology

The question of 'what is technology' is often explored by philosophers (e.g., Andrew Feenberg and Peter-Paul Verbeek, see secondary literature). Ursula Franklin was an renowned experimental physicist but also someone who cared very much about people and planet. Her vision of a peaceful world fits very well with this notion of a safe and just space for humanity, as Raworth described. In chapter 1 of her book "The Real World of Technology" she describes technology as a practice and as a system. While the text was written almost 25 years ago, it is still very relevant for understanding and exploring the digital technologies we use today and which we are designing and developing for tomorrow. The article by Langdon Winner explores the claim that technologies embody specific forms of power and authority. It outlines two ways in which technologies can have political properties. The first one is technical arrangements inscribed in the technology, before the technology is used. The second one is inherently political technologies, that is, technologies that are strongly connected to institutionalised forms of power and control, for example the nuclear bomb. In Winner's article we can find different understandings of technology (deterministic, instrumentalist), which we will further discuss in class.

3. **Franklin, Ursula (1990). The Real World of Technology (Chapter 1, revised edition). Toronto: Anansi [26 pages].**

4. **Winner, Langdon (1980). Do artifacts have politics? Daedalus, Vol. 109, No. 1, Modern Technology: Problem or Opportunity? (Winter, 1980), pp. 121-136. http://www.jstor.org/stable/20024652**

Audio:

Franklin's chapter also available as original audio presentation: https://www.cbc.ca/player/play/14195315

Secondary literature:

- Feenberg, Andrew (2003). What is Philosophy of Technology. Online: https://www.sfu.ca/~andrewf/books/What_is_Philosophy_of_Technology.pdf
- Feenberg, Andrew (2010). The Ten Paradoxes of Technology. Techné 14:1. https://www.pdcnet.org/pdc/bvdb.nsf/purchase?openform&fp=techne&id=techne_200_0014_0001_0003_0015
- Future Learn (n.d.). What can we learn from Latour? [Actor network Theory] Online: https://www.futurelearn.com/info/courses/philosophy-of-technology/0/steps/26326
- Verbeek, P.-P. (2006). Materializing Morality Design Ethics and Technological Mediation. *Science, Technology & Human Values*, *31*(3), 361–380. https://doi.org/10.1177/0162243905285847
- Berg, Anne-Jorunn and Merete Lie (1995). Feminism and Constructivism: Do artifacts have gender? In Science, technology, & Human Values, 20(3): 332-351. http://www.jstor.org/stable/20024652
- Felix Stalder: Escape Velocity. Computing and the Great Acceleration: https://aksioma.org/pdf/aksioma_PostScriptUM_41_ENG_stalder.pdf
- Akrich, Madeleine (1997). The De-Scription of Technical Objects. In Bijker, W. E. and Law, J. (eds), *Shaping Technology/Building Society. Studies in sociotechnical change*. Cambridge: MIT Press, pp. 205-224. Online: https://pedropeixotoferreira.files.wordpress.com/2014/03/akrich-the-de-scription-of-technical-objects.pdf
- Velden, M. van der, & Mörtberg, C. (2011). Between Need and Desire: Exploring Strategies for Gendering Design. *Science, Technology, & Human Values*. https://doi.org/10.1177/0162243911401632

Video:

- Verbeek, Peter-Paul (2017). Moralizing Technology and the ethics of things. Online: https://youtu.be/S8a1DascnZg?feature=shared (17 mins)
- Garrutti, F. & Mishandoush, S. (2020). Misleading Innocence: Tracing what a bridge can do. Online: https://youtu.be/ou6zYcci_5w?feature=shared (49 mins)

PART B – TECHNOLOGY DESIGN

Feb. 19: Power and Technology

The two book chapters for this session explore the design of technology. Who decides what technologies are designed, developed, and put on the market? The article by Feng and Feenberg provide a framework for *deconstructing* technology. They present the notion of intentionality and show that our thinking about the design of technology is not free from constraints. In Participatory Design (PD), the role of power is made explicit. The future users of the technology design are playing a central role in the design of an artefact or service. The article by Birhane et al. is about the challenges and opportunities of applying Participatory Design to the design of AI.

5. **Feng, P. & A. Feenberg (2008). Thinking about Design: Critical Theory of Technology and the Realization of Design Possibilities. In P.E. Vermaas et al. (eds)**

Philosphy and Design: From Engineering to Architecture. Dordrecht: Springer, pp. 105-118. Online: https://link.springer.com/chapter/10.1007/978-1-4020-6591-0_8

6. **Birhane et al.(2022). Power to the People? Opportunities and Challenges for Participatory AI. In:** *Equity and Access in Algorithms, Mechanisms, and Optimization*, **Proceedings of EAAMO '22. Online: https://arxiv.org/abs/2209.07572**

Secondary literature:

o Campolo, A. & Crawford, K. (2020). Enchanted Determinism: Power without Responsibility in Artificial Intelligence. In: Engaging Science, Technology, and Society 6, 1-19 DOI:10.17351/ests2020.277
o Ricaurte, P. (2019). Data Epistemologies, The Coloniality of Power, and Resistance. In: Television & New Media 2019, Vol. 20(4) 350–365 Online: https://doi.org/10.1177/1527476419831640
o Star, S. L. (1990). Power, Technology and the Phenomenology of Conventions: On being Allergic to Onions. *The Sociological Review*, *38*(1_suppl), 26–56. https://doi.org/10.1111/j.1467-954X.1990.tb03347.x

Feb. 26: Design Reparations

How can design help repair the damage repair has caused? How to design technology that does justice to the diverse histories, experiences, and needs found in our communities? The article by Tirone et al. argue that human-centred design has become the bar for 'good design', but at the same time contributed to all kinds of environmental problems. Planet-oriented design is a form of regenerative design as it can address the devastation of the Anthropocene. In the second article, I first show how design can do damage to the diversity of knowledges in the world, by deconstructing the design of Wikipedia. This is followed by a discussion that another design is possible and that respects knowledge diversity in online databases.

7. **Tironi et al. (2022). Problematizing Human-Centred Design: Notes on Planet-Oriented Design. In: Industrial Design. Online: https://www.diid.it/diid/index.php/diid/article/view/diid77-tironi-albornoz-chilet**

8. **van der Velden, M. (2013). Decentering Design: Wikipedia and Indigenous Knowledge. In: Intl. Journal of Human–Computer Interaction, 29: 308–316. Online: DOI: 10.1080/10447318.2013.765768**

Seconday literature:

o Ansari, Ahmad (2019). Decolonizing design through the perspectives of cosmological others: Arguing for an ontological turn in design research and practice. In *XRDS: Crossroads, The ACM Magazine for Students* 26(2): 16-19.
o Birhane, A., & Guest, O. (2020). Towards decolonising computational sciences. *ArXiv:2009.14258 [Cs]*. http://arxiv.org/abs/2009.14258
o Brock, André (2018). Critical technocultural discourse analysis

- Cruz, C.C. Decolonizing Philosophy of Technology: Learning from Bottom-Up and Top-Down Approaches to Decolonial Technical Design. *Philos. Technol.* 34, 1847–1881 (2021). https://doi.org/10.1007/s13347-021-00489-w
- Charlotte Smith, R., Winschiers-Theophilus, H., Paula Kambunga, A., & Krishnamurthy, S. (2020). Decolonizing Participatory Design: Memory Making in Namibia. *Proceedings of the 16th Participatory Design Conference 2020 – Participation(s) Otherwise – Volume 1*, 96–106. https://doi.org/10.1145/3385010.3385021
- Light et al. (2017). Design for Existential Crisis in the Anthropocene Age. C&T'17, 26-30 June 2017, Troyes, FranceOnline: http://dx.doi.org/10.1145/3083671.3083688
- Mohamed, S., Png, MT. & Isaac, W. Decolonial AI: Decolonial Theory as Sociotechnical Foresight in Artificial Intelligence. *Philos. Technol.* **33,** 659–684 (2020). https://doi.org/10.1007/s13347-020-00405-8

Blogposts:

- Fjellheim, E.M. & Carl, F. (2020). 'Green' colonialism is ruining Indigenous lives in Norway. Aljazeera Online: https://www.aljazeera.com/opinions/2020/8/1/green-colonialism-is-ruining-indigenous-lives-in-norway
- Kuhn, G. (2021). Sápmi: Resisting Green Colonialism. Counterpunch, Sept. 8, 2021. Online: https://blog.pmpress.org/2021/09/21/sapmi-resisting-green-colonialism/

Video

- Elva skal leve – 2011: https://tv.nrk.no/program/DNPR64001010
- Let's talk: diversity | Decolonizing Design: Six Steps for Change: https://youtu.be/qefje_KXK1A?feature=shared

March 4: Mandatory Design I - Design Justice

The article by Costanza-Chock discusses a set of design guidelines for doing justice to marginalised communities instead of reproducing injustices. Costanza-Chock introduces important concepts, such as intersectionality and matrix of domination, and discusses the role they play in design. The chapter by D'Ignazio and Klein is from a book that is available for free online. They describe data feminism as "a way of thinking about data, both their uses and their limits, that is informed by direct experience, by a commitment to action, and by intersectional feminist thought".

9. **Costanza-Chock, Sasha (2018). Design Justice: towards an intersectional feminist framework for design theory and practice. In *Proceedings of the Design Research Society*. Online: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3189696**

10. **D'Ignazio, Cathrine and Lauren Klein (2020). Introduction: Why Data Science Needs Feminism. In: *Data Feminism*. Cambridge: The MIT Press (20 pp). Available online at https://data-feminism.mitpress.mit.edu/pub/frfa9szd/release/3**

Secondary literature:

- Shivers-McNair, A., Gonzales, L., & Zhyvotovska, T. (2019). An Intersectional Technofeminist Framework for Community-Driven Technology Innovation. *Computers and Composition*, *51*, 43–54. https://doi.org/10.1016/j.compcom.2018.11.005
- Spiel, K. (2021). Why are they all obsessed with Gender?; (Non)binary Navigations through Technological Infrastructures. In *Designing Interactive Systems Conference 2021* (pp. 478–494). Association for Computing Machinery. https://doi.org/10.1145/3461778.3462033
- Schelenz, Laura (2023). Diversity and Social Justice in Technology Design : Reflections on Diversity-Aware Technology. In: International Journal for Critical Diversity Studies. Online: https://www.scienceopen.com/hosted-document?doi=10.13169/intecritdivestud.5.2.0033

Video:

- Crenshaw, Kimberlé (2016). The urgency of intersectionality. https://youtu.be/akOe5-UsQ2o [18 mins]

Websites

- Just Tech: https://just-tech.ssrc.org/
- Gender Pay Gap Bot: https://twitter.com/PayGapApp

PART C – AUTOMATED FUTURES

March 11: AI Futures

The article by Coeckelbergh and Loh focuses on moral responsibility. They first discuss traditional understandings of responsibility and in what ways such responsibility is not able to address situations in which automation is introduced. The authors discuss two remedies: 1) reconceptualising the traditional concept of responsibility; and 2) transforming the basis for the traditional concept of responsibility. The video 'No to AI, Yes to a Non-fascist Apparatus' investigates how socially applied AI is not only directly intertwined with unresolved injustices of our current system, but actually enables a transition towards authoritarianism that is present in the technology industry itself, in the politics of various countries and institutions, and in the rise of far-right political movements.

11. **Coeckelbergh, M., & Loh, J. (2020). Transformations of Responsibility in the Age of Automation: Being Answerable to Human and Non-Human Others. In B. Beck & M. Kühler (Eds.), *Technology, Anthropology, and Dimensions of Responsibility* (Vol. 1, pp. 7–22). Online: https://doi.org/10.1007/978-3-476-04896-7_2**

12. **Jahic, Sanela (2023). No to AI, Yes to a Non-fascist Apparatus (video; 10:40). Online: https://vimeo.com/803431133**

Secondary literature:

- Bender, E.M. (2024). Resisting Dehumanization in the Age of "AI". In: *Current Directions in Psychological Science*, *0*(0). https://doi-org.ezproxy.uio.no/10.1177/09637214231217286
- Bender et al. (2021). On the Dangers of Stochastic Parrots: Can Language Models Be Too Big? Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency. Online: https://dl.acm.org/doi/10.1145/3442188.3445922
- Timcke, S. (2020). Algorithms and the Critical Theory of Technology. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.3551467

Video:

- DW Documentary (2023). AI: Does artificial intelligence threaten our human identity? (video; 25:55).

March 18: Resisting AI

Is AI "a train that has left the station" and now we can only mitigate risks and impacts? There are tens of different frameworks and sets of guidelines to regulate AI, before and after it has entered our lives, knowingly or unknowingly. Today's readings will not provide you with a set of guidelines for the development of ethical AI (see secondary literature for some examples), but ways how AI is resisted. The essay by Tanni discusses examples of algorithm hacking. The article by Hunger argues to resist the language of AI as found in the media and even in academic articles and proposes more precise concepts that enable a different understanding of AI. The video documentary *The cost of AI* addresses many of the ethical aspects of AI.

13. **Tanni, Valentina (2022). *The Great Algorithm*. Ljubljana: Aksioma Institute for Contemporary Art. Online: https://aksioma.org/pdf/aksioma_PostScriptUM_43_ENG_tanni.pdf**
14. **Hunger, Francis (2023). Unhype Artificial 'Intelligence'! A proposal to replace the deceiving terminology of AI. In: *Training the Archive* – Working Paper Series 6, Aachen/Dortmund (14 pp.). Online: DOI: 10.5281/zenodo.7524493**
15. **The cost of AI. VPRO Documentary (50 mins.). Online: https://youtu.be/bVnpH3DE-MY?feature=shared**

Secondary literature:

- Buolamwini, Joy., & Gebru, T. (2018). *Gender Shades: Intersectional Accuracy Disparities in Commercial Gender Classification*. Proceedings of Machine Learning Research 81:1–15, 2018 Conference on Fairness, Accountability, and Transparency
- Hagendorff, T. Blind spots in AI ethics. *AI Ethics* (2021). https://doi.org/10.1007/s43681-021-00122-8
- Kiran, Asle H., Oudshoor, Nelly & Peter-Paul Verbeek (2015). Beyond checklists: towards an ethical-constructive technology assessment. In *Journal of Responsible Innovation*, 2(1) (15 pp).
- Martin, Kirsten (2019). Ethical Implications and Accountability of Algorithms. In *Journal of Business Ethics*. https://doi.org/10.1007/s10551-018-3921-3

- o Sharkey, Noel (2014). <u>Towards a principle for the human supervisory control of robot weapons</u>. In: *Politica & Società*, 2 (14 pp)
- o Timcke, S. (2020). Algorithms and the Critical Theory of Technology. *SSRN Electronic Journal*. <u>https://doi.org/10.2139/ssrn.3551467</u>
- o Wilson, Christopher and Maja van der Velden (2022). Sustainable AI: An integrated model to guide public sector decision-making. In *Technology in Society*.68: 101926 <u>https://doi.org/10.1016/j.techsoc.2022.101926</u>

<u>Podcast:</u>

- o Machine Learning Street Talk (2023). <u>Postcast with Dan Quillan on Resisting AI</u> (audio/video, 2.51:02)
- o Russel, Stuart (2021). Living with Artificial Intelligence. The Reith Lectures, part 4. [58 mins] <u>https://www.bbc.co.uk/sounds/play/m0012q21</u>

MANDATORY ASSIGNMENT 2A

April 8: Mapping technology controversies

The article by Steen explores design as an ethical practice and presents three design projects: one using participatory desing (PD), one using human-centred design (HCD), and one using co-design. He explores these three projects with one particular form of ethics each: virtue ethics, ethics of alterity, and pragmatist ethics.

16. **Steen, M. (2015). Upon Opening the Black Box and Finding It Full: Exploring the Ethics in Design Practices. In: *Science, Technology, & Human Values*, Vol. 40, No. 3, pp. 389-420 Online: <u>https://www.jstor.org/stable/43671241</u>**

THEME IV – SUSTAINABLE FUTURES

April 15: Technofixes

Are technofixes able to bring us closer to a more sustainable future? Whose future are we talking about? Why are technofixes so popular for addressing the climate and biodiversity emergencies? The chapter by Joanne Boehnert discusses technofixes, in particular technological problems for environmental challenges. She introduces concepts such as eco-modernism and degrowth. The article by Sætra and Selinger (Henrik Sætra will give a guest lecture) is about unpacking the different terminology used when talking about technofixes. They also address the history of terms such as tchnofix, techno-optimism, and techno-solutionism.

17. **Boehnert, Joanne (2018). *Design, Ecology, Politics: Towards the Ecocene*. London: Bloomsbury (Chapter 14. The technofix, 10 pp). (pdf will be made available)**

18. **Sætre, H. & Selinger, E. (2023). The Siren Song of Technological Remedies for Social Problems: Defining, Demarcating, and Evaluating Techno-Fixes and Techno-Solutionism. Online: <u>https://papers.ssrn.com/abstract=4576687</u>**

Secondary literature:

o Bell, S. E. , Daggett, C. & Labuski, C. (2020). Toward feminist energy systems: Why adding women and solar panels is not enough. Energy Research & Social Science 68. Online: https://www.sciencedirect.com/science/article/pii/S221462962030133X

o McKinnen, B. (2022). In a World on Fire, Stop Burning Things. In The New Yorker: https://www.newyorker.com/news/essay/in-a-world-on-fire-stop-burning-things

o Ryan, M., Antoniou, J., Brooks, L., Jiya, T., Macnish, K., & Stahl, B. (2019, August 28). *Technofixing the Future: Ethical Side Effects of Using AI and Big Data to meet the SDGs*. https://doi.org/10.1109/SmartWorld-UIC-ATC-SCALCOM-IOP-SCI.2019.00101

o Dunlap, A. (2018). The 'solution'is now the 'problem:'wind energy, colonisation and the 'genocide-ecocide nexus' in the Isthmus of Tehuantepec, Oaxaca. In *The International Journal of Human Rights*.

o Dunlap, A. & Marin, D. (2022). Comparing coal and 'transition materials'? Overlooking complexity, flattening reality and ignoring capitalism. In *Energy Research & Social Science*.

o Sovacool, B. K., & Dunlap, A. (2022). Anarchy, war, or revolt? Radical perspectives for climate protection, insurgency and civil disobedience in a low-carbon era. In *Energy Research & Social Science.*

o Pierce, J. (2012). Undesigning technology: considering the negation of design by design. In *CHI'12: Proceedings of the SIHCHI Conference on Human Factors in Computing Systems,* May 2012, pp. 957-966 (10 pp).

Audio:

Rich countries' climate policies are colonialism in green — with Vijaya Ramachandran: https://www.youtube.com/watch?v=cHS6kIeNtkI&ab_channel=InPursuitofDevelopment

April 22: Sustainable Digitalisation

The article by Sara Lenz discusses if and how digitalisation technologies can address socioecological problems. She discusses two forms of sustainability, weak and strong, and three ways in which digitalisation is perceived as contributing to sustainability: as modernisation, transformation, and control. The report by Lange et al. discusses the role of digital technologies in the *twin transition*, the digital and energy transition towards a non-fossil future. They argue that the twins are not equal; digitalisation can contribute to a deeps sustainability transformation, but only when its technologies are ecologically sound and just.

19. Lenz, Sara (2021). Is digitalization a problem solver or a fire accelerator? Situating digital technologies in sustainability discourses. In Social Science Information, 60(2): 188-208. Online: https://doi.org/10.1177/05390184211012179

20. Lange et al. (2022). Why Digitalisation Needs To Be Redirected: Redirecting Technologies for the Deep Sustainability Transformation. (Read Introduction and Chapter 1). **Online: https://depositonce.tu-berlin.de/handle/11303/17406**

Secondary literature:

- The opportunities and risks of digitalisation for sustainable development: a systemic perspective | *GAIA* 30/1 (2021): 23 – 28
- Lucivero, F. (2020). Big Data, Big Waste? A Reflection on the Environmental Sustainability of Big Data Initiatives. *Science and Engineering Ethics*, *26*(2), 1009–1030. https://doi.org/10.1007/s11948-019-00171-7
- Sacco, P., Gargano, E. R., & Cornella, A. (2021). Sustainable Digitalization: A Systematic Literature Review to Identify How to Make Digitalization More Sustainable. In Y. Borgianni, S. Brad, D. Cavallucci, & P. Livotov (Eds.), *Creative Solutions for a Sustainable Development* (pp. 14–29). Springer International Publishing. https://doi.org/10.1007/978-3-030-86614-3_2
- Renn, O., Beier, G., & Schweizer, P.-J. (2021). The opportunities and risks of digitalisation for sustainable development: A systemic perspective. *GAIA - Ecological Perspectives for Science and Society*, *30*, 23–28. https://doi.org/10.14512/gaia.30.1.6
- Ricaurte, P. (2019). Data Epistemologies, The Coloniality of Power, and Resistance. *Television & New Media*, *20*(4), 350–365. https://doi.org/10.1177/1527476419831640
- Trittin-Ulbrich, Hannah, Scherer, A. G., Munro, I., & Whelan, G. (2021). Exploring the dark and unexpected sides of digitalization: Toward a critical agenda. *Organization*, *28*(1), 8–25. https://doi.org/10.1177/1350508420968184

Websites:

- Geneva Environment Network (2021). Data, Digital technology, and the Environment. Online: https://www.genevaenvironmentnetwork.org/resources/updates/data-digital-technology-and-the-environment/
- ICT Works (2020). Digital Technologies Are Part of the Climate Change Problem. Online: https://www.ictworks.org/digital-technologies-climate-change-problem/#.X1hLyXlKiUk
- The dark side of digitalization – and how to fix it. Online: https://www.weforum.org/agenda/2020/09/dark-side-digitalization/

April 29: Regenerative technologies

In 'Fixing the world one thing at the time', I report from a participatory observation project in a repair café in Amsterdam. I discuss community repair as a sociomaterial activity, an activity in which the social (humans) and materials (things) are entangled and new understandings of design, consumption, and use emerge. The article by Camrass presents key features of regenerative approaches and eight principles for regenerative thinking and practice. It applies several interesting approaches, such as Causal Layered Analysis (CLA), backcasting, deconstruction, use of metaphors, and thematic analysis.

21. **van der Velden, M. (2021). 'Fixing the World One Thing at a Time': Community repair and a sustainable circular economy. In: Journal of Cleaner Production, 304, 127151. Online: https://www.sciencedirect.com/science/article/pii/S0959652621013706**

22. Camrass, K. (2023). Regenerative Futures: Eight Principles for Thinking and Practice. In: Journal for Future Studies, 28(1), p. 89-99. Online: https://jfsdigital.org/wp-content/uploads/2023/09/Regenerative-Futures.pdf

Secondary literature:

o Hutchins, Giles & Laura Storm (2019). Regenerative Leadership: The DNA of life-affirming 21 st century organizations (chapter 1). Online: https://static1.squarespace.com/static/5c3db2437c9327e0771e2ed0/t/5e8b1eb6e37ead7fc59c445c/1586175888858/Regenerative+Leadership+Book_Chapter+1.pdf
o Reed, B. (2007). Shifting from 'sustainability' to regeneration. *Building Research & Information*, *35*(6), 674–680. https://doi.org/10.1080/09613210701475753
o Lyng, K-A & van der Velden, M. (2024). The lifecycle of electronic devices. Online: https://www.sustainabilitylab.uio.no/projects/circular-energy/the-life-cycle-of-electronic-devices_converted_screen(1).pdf

Online presentations:

o Reed, Bill (2011). From Sustainability through Regeneration: Whole and Living System Design. Online: https://youtu.be/BFzEl1rZG_U
o Wahl, Daniel (2018). Designing for Regeneration & Planetary Health. Online: https://youtu.be/drYoL-wAop8

Blog posts:

o Jankel, N. S. (2021, May 27). Regenerative Tech: Slow Down & Mend Things. *Switch On*. https://medium.com/switch-on/regenerative-tech-slow-down-mend-things-fdfc04eb6cc7
o Siegel, R. P. (2020). *Regenerative products just might save the planet – and the economy*. Strategy+business. Retrieved September 12, 2021, from http://www.strategy-business.com/article/Regenerative-products-just-might-save-the-planet-and-the-economy

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