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Introduction

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Mollen, Anne ; Jansen, Fieke; Kannengießer, Sigrid; Velkova, Julia

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CHAPTER 1

Introduction: De-Centring Artificial Intelligence and Rethinking Sustainability

Anne Mollen, Fieke Jansen, Sigrid Kannengießer, and Julia Velkova

A Future where "AI Is Everywhere"

We live in a moment of extreme hype over Artificial Intelligence (AI). Data-driven decision-making and large language models (LLMs) are promoted in an expanding array of domains ranging from everyday

A. Mollen (✉) · S. Kannengießer
University of Münster, Münster, Germany
e-mail: anne.mollen@uni-muenster.de

S. Kannengießer
e-mail: sigrid.kannengiesser@uni-muenster.de

F. Jansen
University of Amsterdam, Amsterdam, Netherlands
e-mail: fieke@criticalinfralab.net

J. Velkova
Linköping University, Norrköping, Sweden
e-mail: julia.velkova@liu.se

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communication to healthcare and medical practice, public administration services, education and knowledge production, agriculture, energy infrastructure management and even ice cream (Godske, 2024). Packaged and branded as "AI services", these technologies tend to be advertised through familiar tropes that emphasise their economic potential, effortless "knowledge" about the world, "creativity" in visual and textual outputs while offering digital companionship, care services and the promise to save large economies, such as those in Europe, from recession. Attributed with increasingly mythical qualities and seemingly all-encompassing powers, AI as computational data-driven practices have been, at least in Europe, promoted as the solution to most contemporary social, environmental and economic problems (European Parliament, 2025).

As a result, and with worrisome regularity, high-level events are now being held, where—as in the case of the February 2025 AI Action Summit in Paris—politicians and industries propose innovation, investment and deregulation as the way forward to carve out a place for Europe in the ongoing "AI race". Proposing a market-oriented focus that speaks to existing European and national "AI strategies", their approach calls for the allocation of unfathomable budgets for research into innovation and adoption of AI and encourages public institutions to provide access to new data sources needed to train language models (European Commission, 2025; Jansen, 2021). The message is that innovation and prosperity can only be achieved with AI, which requires infrastructural capacity. As European Commission president Ursula von der Leyen (European Commission, 2025) spelled out in Paris, it envisions a future where Europe will become "one of the leading AI continents", which "means embracing a way of life where AI is everywhere" (von der Leyen, 2025, par. 2). The European Union's response to the global AI race has thus focused on investing in expansions of computation and data centre infrastructures across the continent, exemplified by the announcement of the construction of thirteen AI gigafactories to provide the necessary infrastructure for AI-saturated futures.

This book develops a critical infrastructural perspective on these developments. It explores the inequalities, economies and societal conflicts that are emerging as industries, administrations and individuals increasingly position AI as an authority and agent of social change, while also producing the socio-material conditions for this change. Often termed as inevitable, effortless and immaterial, implementations of LLMs and

data-driven decision-making depend upon the availability of human and technological infrastructures, as well as upon transnational supply chains that keep these infrastructures functioning. Hard drives to store data, processors and chips to process it, electricity to power server racks, minerals and metals, wires, expertise and people: all these entities must be sourced and arranged to form productive relations and enable AI in distinct contexts of use and imagination (Parks et al., 2023). This book investigates how AI infrastructural pervasion is embedding and extending histories of colonialism, racism, neoliberalist expansion and the exploitation of nature and people. In other words, it explores AI at the intersection of infrastructure and sustainability.

Investigating AI infrastructures and sustainability for the purpose of making AI more just is an urgent endeavour, especially with the concentrated political push to materialise an infrastructure for an AI-enhanced digital future in Europe and beyond. This concern becomes even more pressing in times when public and expert resistance to computational, data-driven approaches to the social domains are being trivialised. Societal anxieties about AI are unfolding in parallel to concerns about the significant material and infrastructural demands of these technologies and shifts in energy supply occurring in attempts to secure (presumably) clean energy sources for the massive energy needs of AI development (Bender et al., 2021; Strubell et al., 2020). Nevertheless, among policymakers, developers and marketers, the immense social and environmental justice implications of AI technologies (Crawford, 2021) are predominantly discussed as manageable based on technological progress (Sætra, 2023). As a result, attempted net-estimations of AI's environmental benefits versus its environmental risks dominate discussions in media, policy, science and industry (Kaack et al., 2022). This techno-determinist approach neglects decades of scientific knowledge on how sociotechnical transformations unfold, as well as the fact that technology is never teleology. Technologies do not roll out in an empty social space but are part of complex, friction-filled negotiations with uncertain outcomes. The manifold harms to the communities and environments along the AI supply chain, however, tend to be ignored, while the environmental and societal impacts of AI are downplayed against the potential of future benefits.

Media and communication scholars have argued that the energy and resource consumption of the digital industries cannot be separated from issues of societal and economic exclusion, demonstrating how the energy

and resource demands of AI and online communication crowds out other businesses, limits local energy access and perpetuates societal inequalities and conflicts through infrastructure (Bresnihan & Brodie, 2021; Libertson et al., 2021). Taking inspiration from such investigations, the contributions of this book exemplify how potentiality-risk dichotomies and the resource fetish of sustainable AI debates conceal the complex entanglements between AI technologies and sustainability that emerge when interrogating AI infrastructures in their complexity and broadness. By adopting an infrastructural perspective and accounting for the various actors involved, this book takes the study of AI and sustainability beyond techno-solutionism, carbon accounting and net-impact calculations. It contributes to an understanding of the wide array of relations entangled with AI and its material underpinnings.

The book connects different fields within and across media and communication research, including environmental media, infrastructur approaches, critical data centre studies and human–machine communication (Edwards et al., 2024; Guzman & Lewis, 2019; Jue & Ruiz, 2021; López et al., 2024; Maxwell & Miller, 2012; Plantin & Punathambekar, 2018; Starosielski & Walker, 2016). It builds and expands upon emergent scholarship in media studies, science and technology studies (STS) and adjacent fields in the area surrounding the sustainability of digital infrastructures like data centres and their constituting elements (Brodie & Bresnihan, 2025; Diez & Bejarano, 2025; Jankovic & Keilbach, 2023; Kellog et al, 2024; Lehuedé, 2022; Pasek, 2023; Valdivia, 2024). Following Suchman's (2023) call to situate (what are being labelled as) AI technologies in their various locations and relations, the contributions to this book focus on diverse elements of AI infrastructures and the actors, relations and norms that ensue. Together, they paint a picture of how AI developments and the socio-technical relations that undergird them emerge and shape local and global conflicts, geopolitics and political economy shifts in different industrial sectors and powers.

Expanding Perspectives

This book builds and expands on contemporary media and communication approaches to technologies of automation, platforms, environmental media and infrastructural approaches. Previous research into digital media, platform infrastructures and critical data and algorithm studies

has demonstrated how inquiries into the materialities undergirding digital media allow researchers to grasp the complex (geo)political, societal and economic relations through which contemporary media takes shape (Amoore, 2020; Dencik, 2022; Plantin & Punathambekar, 2018). Such studies have discussed emergent and reconfigured constellations of interests, ideologies, norms, values and power dynamics related to developing digital communication technologies. The past decades have also witnessed a boom of scholarship investigating digital interfaces, data practices and information transmission (Dencik et al., 2022; Flensburg & Lai, 2023; Milan & Velden, 2016; Ruckenstein, 2023; Parks & Starosielski, 2015). More recently, these studies have been expanded by an increasing scholarly interest in communicative AI, with a heavy focus on how research agendas for and theorisations about societal communication must be adapted as automated communication grows (Guzman & Lewis, 2019). However, infrastructural perspectives on automated technologies have been marginal and require further development. Meanwhile, other disciplines have provided insights into how AI technologies foster various forms of exploitation of natural resources and the environment, labour and working conditions and societal representations (Birhane et al., 2023; Crawford, 2021; Gray Widder et al., 2023; Miceli et al., 2022). Building on these works, there is an urgent requirement for further perspectives on the sociotechnical relations creating and surrounding AI.

This book expands perspectives in media and communication approaches to AI alongside analyses of AI as a phenomenon through its infrastructures. Specifically, it addresses two research gaps. First, it provides a missing perspective in academic discussions about the sustainability of AI. Such discussions have primarily occurred in engineering fields like machine learning (Kaack et al., 2022) or humanistic disciplines like practical philosophy (van Wynsberghe, 2021). This book brings the analysis of complex social processes in relation to AI sustainability within the range of media and communication studies, contributing new perspectives to interdisciplinary discussions on the topic. Second, it extends the work of scholars in environmental media and critical data studies, which are concerned with the materialities and environmental relations that sustain digital media (Crawford & Joler, 2018; Gabrys, 2014; Kannengießer, 2019; Parks & Wallker, 2020; Shriver Rice & Vaughan, 2020; Starosielski, 2021; Starosielski & Walker, 2016), and transfers them to the landscape of AI imaginaries, economies, materialities and governance.

Accordingly, the book orients scholarly attention towards the materialities, places, people and relations that constitute AI. It moves beyond the domain of symbolic interactions and human–machine communication while critically assessing claims that AI technologies can contribute to the efficiency and effective management of natural resources (Rolnick et al., 2022). Various questions drive its contributions. How is sustainability produced and practiced in relation to the development and maintenance of infrastructures for AI (and vice versa)? How is the relationship between AI infrastructures and sustainability constructed, by whom and to what ends? What implications does this relationship have for social, economic and environmental wellbeing? These questions are vital to ask for critically assessing how social practices are being transformed with digital technologies through four key arenas, which contributors address throughout this book.

First, current developments in the discussion of sustainability reflect an accelerated move towards techno-solutionism, in which AI technologies are increasingly positioned as actors that can produce sustainability. The potentials and risks of AI for achieving the Sustainable Development Goals (SDGs; United Nations [UN], 2015) were being discussed and criticised even before the advent of generative AI (Sætra, 2023; Vinuesa et al., 2020). However, with the intensifying societal diffusion and discussion of AI, justifications of its investment and infrastructural extension are increasingly based on claims that it will solve the climate crisis. These claims are discursively played out by key actors like OpenAI CEO Sam Altman (2024), who has made the unsubstantiated claim that AI "will fix the climate" (par. 18). There is therefore an urgent need to critically investigate how the relationship between AI infrastructures and sustainability is discursively constructed by various actors and within diverse spheres and arenas.

Along this first movement, a second tendency encompasses the increasing commodification of climate issues through AI companies that position themselves and their services as a sustainability solution for other industries. They focus on reducing sustainability to issues of efficiency, knowledge and resource optimisation, detaching AI and other industries from their polluting, extractive and oppressive realities throughout their supply chains (Dauvergne, 2022). These practices of commodifying sustainability efforts require critical interrogations into the emerging meanings of sustainability (e.g. what counts as sustainable and for whom), their implications and how they manifest within AI infrastructures.

Third, a resource-oriented escalation is ongoing, in which the current growth of AI applications results in increasing competition around resources and aggravating contestations along AI infrastructures. For example, data centre and software industries are making sustainability pledges, enrol renewable energy sources, establish carbon off-setting schemes while the optimisation of energy consumption is frequently presented as pathways to achieve NetZero emissions (Day et al., 2022). While these "green" ambitions are themselves riddled with problems, they stand in stark contrast to their industries' growing thirst for land, energy, water and critical raw materials. Emerging conflicts around these resources not only raise questions about governance and future adherence to the established values of welfare societies, but they also indicate a need for new trajectories in speaking, thinking and governing those heavily contested futures.

Fourth, current geopolitical shifts are drastically changing priorities in AI and infrastructural policies and investments. These shifts have not only shattered US–European alignments on digital policies, they have instigated a dismantling of international governance frameworks and shared norms. Consequently, ongoing geopolitical shifts have resurfaced debates on European infrastructural sovereignty (Caffarra et al., 2025), aggravating the geopolitical race for market hegemony over AI technologies and control over their constituting elements like components, datasets, models and infrastructure (while risking the side-lining of justice and sustainability concerns). These geopolitical developments not only fuel fears of missing out and being pushed to the periphery, they are the latest incarnation of a long line of colonial and imperialistic politics and practices of hegemonic powers exploiting nature and people from marginalised groups and regions.

Substantiated through these key developments, the contributions to this book exemplify how potentiality-risk dichotomies and resource-fetishism approaches that promote sustainable AI conceal the complex entanglements between nature, industry and power. Authors foreground these frictions by interrogating the sociotechnical systems that enable AI operations throughout the supply chain, from the cradle to the grave and beyond the traditional boundaries of communication studies. In this sense, the book expands perspectives in media and communication approaches to AI by focusing on infrastructure and its normative relation to sustainability alongside understandings of AI systems and discourses as phenomena that unfold across the material and social infrastructures

that enable their operations. In other words, this book moves beyond the cultural imagination that AI is a progressive force and a tool with no cost. The chapters contextualise AI infrastructure expansions within local contexts and across countries, economies and cultures. These analyses expose the fact that there are no sustainable AI infrastructures *per se*. There is not one but many AI infrastructures (Mol, 2002) and ensuring sustainable and equitable AI futures requires change to current economic and political systems and values.

Infrastructural Relations

AI is not a new phenomenon. Scholars of the ideas and histories of machine intelligences have criticised the technologically-driven mythologies that depict AI and algorithms as substance-less (Elish & Boyd, 2018), powerful media (Natale, 2021) that exist beyond social and technological constraints (Amoore, 2020). Such research addresses a key concern Lucy Suchman (2023) formulated in questioning the "thingness" of AI. Responding to her call "for a keener focus on [these technologies'] locations, politics, material-semiotic specificity and effects" (Suchman, 2023, p. 4), this book positions sustainability as a central concern of inquiry for technological developments and digital services branded as AI, which are here investigated through an infrastructural lens.

Infrastructural perspectives have gained prominence in media and communications studies over the past decade. The infrastructural turn (Hesmondhalgh, 2021; Lai & Flensburg, 2023; Parks et al., 2023; Parks & Starosielski, 2015), has brought new empiric objects and sites into purview for scholars while engaging with traditional questions of media research, including how sociotechnical relations organise power, economies and knowledge. Conceptions of power within digital infrastructures research have been particularly central to such analyses, including investigations into the geopolitics, political economy and temporalities of internet infrastructures (Lai & Flensburg, 2023; Parks et al., 2023; Velkova & Plantin, 2023) and AI technologies (van der Vlist et al., 2024). The contributions to this volume are grounded in this field and expand it through a focus on sustainability. The authors investigate how infrastructural entities like platforms, undersea cables, data centres, newsrooms, mines and fish farms intersect with questions of sustainability alongside environmental and social justice.

Throughout, this book follows an approach to infrastructure proposed by Susan Leigh Star (1999) as the study of "boring things", including arrangements of people, data and code (Seaver, 2017) as much as the arrangements of matter, land, energy, markets, regulations and the humans and nonhumans involved in them (Suchman, 2023). How AI is defined affects how it is governed and which of its impacts are highlighted. For example, an emphasis on AI as an algorithmic system shaped by data practices reflects the cultural and organisational work of making social relations legible, calculable and prone to machine automation in commercial and public sector contexts and opens up issues of discrimination, humanisation and public value reconfigurations to governance and critique. Other definitions productively highlight AI "as a flow of materials (e.g., minerals and metals used to create GPUs), energy (e.g., water and electricity feeding data centres) and a set of encounters between layers of a large data infrastructure" (Cellard et al., 2025). At the same time, the point here is not to provide a single truthful definition but to highlight the political nature of definitions as knowledge devices that obscure or foreground AI's elements and aspects (Suchman, 2023).

Based on critical research on media infrastructure (Parks & Starosielski, 2015), we thus define AI infrastructures as material-discursive arrangements that enable the automated transformation of information from individual data points to agglomerated outputs through probability assessments and large-scale data processing based on respective computing means. This prompts an analysis of all the relational structures formed by materials, technologies, actors and practices through which AI emerge (Mollen & Kannengießer, 2025). This approach reflects what Brian Larkin (2013) has described as the non-positivist appearance of infrastructures and its definition as a categorial act, meaning that "any particular set of intellectual questions will have to select which of these [infrastructural] levels to examine" (p. 330). Any such categorical act will highlight certain issues and obscure others. For example, software engineering and informatics depict AI infrastructure through diagrams and charts that describe neural networks with their neurons and nodes, suggesting uniformity and distance from the actual ways these networks and industries operate in practice and their differences (Cohn, 2023). This extends a historical trajectory of technoscientific approaches to computing that emphasise its mathematical operations above any other dimension (Pasek, 2023).

When infrastructure is acknowledged as a socio-technical system it encourages inquiry into the consequences and conflicts of expansion

(Parks, 2020; Parks & Starosielski, 2015; Plantin & Punathambekar, 2018). An infrastructural perspective thus foregrounds the many relations and frictions that evolve around AI and its constituent materialities as a relevant factor within broader sustainability discussions, especially as matters of social and environmental justice. For example, contributors in this volume deconstruct how approaches focused on the supposedly sustainable extraction and management of natural resources remain intrinsically flawed by producing a narrative that neither corresponds with questions of intra-and intergenerational justice (UN World Commission on Environment and Develoment [UN WCED], 1987) nor reaches agreed-upon climate goals (Buller, 2022). Our interest thus resonates with recent calls made by scholars to expand the critical insights currently missing in computer science, industry and public policy debates concerning AI. These insights centre attention on the productions of places, transforming ecologies and lands and to recraft the stories and narratives through which we understand AI systems.

This book thus engages with the situated practices through which actors who promote and build AI solutions produce discourses and arrange materialities, cultural expectations and economies under the "AI" label across differences of definition, place, and time. Contributors discuss actors like tech companies, governments, workers, developers, end users, data centre corporations, journalists, fish, forests, activists and many more, who among other things deploy, govern, create, extract, collect, live and exist in relation to AI technologies. In this sense, infrastructures are relative (Hesmondhalgh, 2021), in so far as that they mean different things for different actors. They are also inherently relational, since "infrastructure is something that emerges for people in practice, connected to activities and structures" (Star & Ruhleder, 1996, p. 122). From a non-anthropocentric approach, this also extends to non-human and more-than-human actors.

Multiple Sustainabilities

This book embraces a broad conception of sustainability that engages justice, equality and capabilities (Sen, 2008; UN WCED, 1987), with a more-than-human and multispecies focus (Bossert & Hagendorff, 2023; Tschakert, 2022) as well as non-Western conceptions of living with and in nature (Liboiron, 2021) as central to an encompassing engagement

with AI and sustainability. Contributions deconstruct the narrow discussions on the emissions and resource consumption of AI systems that have come to dominate mainstream societal, industrial and political discourses around AI and sustainability (Kaack et al., 2022; Vinuesa et al., 2020). This broad conception of sustainability is imminent when engaging with AI through an infrastructural perspective that foregrounds the many relations actors can have with different materialities (Star & Ruhleder, 1996).

Originally described by von Carlowitz in the context of forest management (Saxon Hans Carl von Carlowitz Society, 2013), the very origins of the term "sustainability" allude to an understanding of intergenerational justice, as later evoked by the UN approach to sustainability as intra-and intergenerational justice (UN WCED, 1987). Meanwhile, its historical usage to mean sustaining forestry or agriculture for future generations implies a focus on the enduring use of resources for a social entity; in other words, extraction that is constrained within limits to guarantee its continuity (Warde, 2018). Sustaining a forest for economic gains is, in other words, conceptualised as a management and knowledge problem of which trees to cut or plant, how to account for loss from diseases, and so on. Functionalist approaches to AI technologies and their potentials for SDGs (Vinuesa et al., 2020) rely on a similar understanding of sustained natural resource exploitation. They conceptualise sustainability as an issue of knowledge, efficiency and resource management and thus join a long line of techno-solutionist approaches presenting technologies in general and AI specifically as quick fixes for complex problems (Morozov, 2014; Sætra, 2023). Much of the debate on AI and sustainability is thus focused on bringing AI development and application within planetary boundaries (Raworth, 2017; Rockström et al., 2009) and using AI technologies to make industrial production more efficient and for reducing carbon emission (Kaack et al., 2022; Rolnick et al., 2022). Sustainability here offers a normative framework, focused on bringing AI technologies in line with inter-and intragenerational justice ambitions (UN WCED, 1987), in which climate change mitigation is considered a cornerstone of sustaining the planet for future generations.

With its focus on AI infrastructures as socio-technical systems, this book is a continuation of media and communication research that has discussed the connection between digital media and sustainability (Kannengießer, 2019; Maxwell & Miller, 2013; Pasek, 2023; Pasek et al., 2023) and argued that the energy and resource consumption of the digital

industries cannot be separated from issues of societal and economic exclusion. Matters of resources can therefore never be separated from wider sustainability implications and, consequently, very different concepts of sustainability.

De-Centring AI and Rethinking Sustainability

With AI-saturated futures governed to become reality (Von der Leyen, 2025), it is important to address AI infrastructures as socio-technical systems constituted through networks of objects, actors, practices, norms and values, since they are shaping future societies. The study of AI infrastructures thus not only concerns how AI changes societal communication in different societal spheres (Guzman & Lewis, 2019), but how certain projections of AI-saturated futures materialise within sites, localities and relations that usually remain hidden when discussing where users and AI are interfacing. Moving beyond these commonplace understandings of the relationship between AI infrastructures and sustainability requires approaches that de-centre AI. This book takes its cue from Peña Gangadharan and Niklas (2019), who proposed de-centring as an approach to "'see through' technology, acknowledging its connection to larger systems of institutionalised oppression" (p. 882). This de-centring of AI allows a consideration of the very materiality that enables the large-scale processing of data. As chapters across this book demonstrate, these materialities must be considered in their infrastructural contexts, which are always constituted through technology, hardware, software, data sets, communities, industries, governance regimes, people, plants and many others.

De-centring AI by situating it in its local relations foregrounds inconvenient questions of how to align AI with sustainability in current governance regimes. Empirical insights from this book indicate that citizens envision better governance and alternatives to the status quo, moving toward original ideas of the welfare state, participatory approaches and de−/post-growth conceptions, inherently implying changes to current political and economic systems. By orienting our perspectives towards infrastructures and sustainability in current discussions around AI, we thus position media and communication research as relevant for interdisciplinary and policy discourses around AI and sustainability. These could possibly navigate within current regulatory and governance architectures

while also engaging in contemplation about different digital futures, systemic changes and utopias with (or without) AI.

Thus, we also connect and re-position established and new directions in the field (e.g., political economy and infrastructural approaches) beyond functionalist approaches to AI and sustainability. This book demonstrates how ideas of AI and sustainability are envisioned together, how current conceptions of sustainable AI need to be deconstructed and how the shift towards AI solutionism must be problematised. Meanwhile, contributors propose rethinking sustainability according to local contexts (e.g., geopolitical, commercialisation), foregrounding how, for instance, from the Amazon to Northern Sweden, risks are outsourced to those who do not (want to) profit from AI. This book demonstrates that rethinking sustainability highlights new forms of frictions and injustice, develops new vocabulary and discourse to describe these phenomena and imagines governance for AI that accounts for both direct and indirect harms.

Rethinking sustainability thus becomes an analytical approach to question and challenge the values and worldviews underpinning AI infrastructures. In this book, for example, Seyfrin and Velkova's case study of a "good" AI infrastructure reveals that there is no single understanding of sustainability: different (and sometimes conflicting) meanings get attributed to the concept and reflect different valuations of what is "good". As such, we cannot limit questions of AI infrastructure and sustainability to its direct impact; it requires a more profound analyses of the worldviews and values that govern and organise society, including questions of what is considered valuable, what can be discarded and at what cost. This is not to say that sustainability becomes irrelevant as a concept. Indeed, the opposite must be argued when examining AI infrastructures and their social, ecological and economic impacts. Rather, we must rethink recent dominant paradigms of sustainability.

This ambition can surely be pushed further. As a book within a European media and communication-focused series, it situates the discussion within primarily European locations, industries, governance rationalities and discourses that are visible to us from our position. Contributors provide unique insights into countries and regions, such as the Netherlands and Sweden, that are struggling to govern the data centre boom. Geopolitical tensions matter fundamentally to AI relations but target specific countries very differently, as exemplified by contributions about Poland (as a Central and Eastern European example) or Yandex, a

company operating within Russia's autocratic regime. Similarly, infrastructural AI components that span the world matter to how global peripheries are being re-constructed, from Ireland as a historical European periphery to Brazil, which is becoming an increasingly important network component not only due to undersea cables but its access to minerals and hydropower. Despite geographical, political and industrial shifts in relation to AI infrastructures and sustainability, colonialist logics and distributional injustices persist. Across this book, contributors exemplify how these extractive frontiers are being renegotiated in industries as diverse as agriculture, forestry, journalism or technology. However, this is by no means exhaustive; this book emerges within the context of ECREA, and as a result the chapters present only a fraction of local perspectives, mostly within Europe, and cannot account for the very relevant African or Asian perspectives, and for other regions around the world.

Contributions: From the Cradle to the Commodity

Despite their different foci on AI infrastructures and sustainability, all chapters in this book highlight that even though AI is touted as shiny new technology, underlying industrial logics in digital industries continue to shape old trajectories of power agglomeration, exploitation and distributional injustices. The book is structured into three parts, moving from the "birth" of AI resources in Amazonian mines into its manifestation within discourses and industries and towards projections of AI futures in politics and governance.

The chapters in the first part of the book, "Elements, Materials, Resources", engage with the materialities of AI infrastructures, how they are produced and understood and their implications on ideas of sustainability. Contributors engage with the politics of employing minerals, fish, sub-sea cable network systems, electricity and other materialities in the service of cloud computing, expanding objects and matters of mediation within media and communication research. The authors reveal and discuss the different socio-ecological sustainability implications caused by extraction and exploitation as well as the entangled industrial logics, matters of territoriality and politics in the context of media and communication as a discipline.

The second part of the book, "Promises, Economies, Discourses", focuses on the ways AI infrastructures and sustainability are imagined by different actors in different arenas and from different geopolitical

positionings. Contributors deconstruct scientific, industry, news media and popular discourses on AI and sustainability and critically investigate the practices and representations of "sustainable AI" announced by big tech companies, science communication and journalism. Chapters explore crucial questions regarding the governance of AI-related market dynamics, digital sovereignty, responsibility and sustainability, as well as ethical questions surrounding the downstream uses of AI technologies, such as in journalism.

The third section, "Futures, Politics, Governance", analyses power asymmetries in the AI industry and their interdependence with matters of social and ecological sustainability. Authors explore options to deconstruct techno-solutionist arguments within discourses on AI infrastructures and sustainability and propose more liveable relations with AI infrastructures. They explore questions of scarcity in relation to AI, provide and develop alternative imaginaries and thereby constructively oppose techno-solutionism while simultaneously analysing the transformative potentials of AI development.

Together, these sections exemplify how AI infrastructures emerge from and within local contexts while co-producing global AI infrastructures, thus positioning their localities as crucial for understanding the planetary implications of AI and sustainability.

Elements, Materials, Resources

In her contribution, Ana Valdivia makes the point to "follow the GPU" (graphical processing units, specialised for AI applications) along the AI production chain to account for the manifold relations that must be considered in relation to AI infrastructures and sustainability. She engages with the commodity fetishism of AI, which purposefully renders its materials, infrastructures and producers invisible. Based on the method of "follow-the-thing" she traces the journey of AI chips, from mineral extractivism to e-waste, revealing the environmental costs at each stage of the AI commodity chain. She argues that such an expanded perspective is crucial to de-fetishise and nuance the cost-benefit equations within discussions of AI and sustainability.

By locating AI in the Amazon, Débora Leal, Max Krüger and Sigrid Kannengießer focus on mining as the "cradle of AI infrastructure" and exemplify how the exponential demand for computing devices results in the increasing extraction of gold, tantalum, copper, cobalt and other

minerals essential for manufacturing GPUs. Within and in extension of the respective mining sites, many social and environmental justice concerns emerge in the local communities that must be accounted for when considering sustainability in relation to AI. Mining sites exemplify how pollution, health hazards, rising crime rates, sex work, and the severe endangerment of workers in illegal mining are shaping relations with AI infrastructures. The chapter argues the need to acknowledge all materials, actors and practices that are directly and indirectly involved with AI as part of an infrastructural understanding. By integrating indigenous perspectives, the chapter calls for the deconstruction of hegemonial understandings of sustainability, arguing that mining will always be exploitative and that AI infrastructures can therefore never be sustainable.

The infrastructural perspective on AI in this book thus acknowledges the highly different relations people can have with technology across the globe and even within the same country. To retain Brazil as an example, while the mining of GPU-relevant minerals in the Amazon are often made peripheral to discussions of AI and sustainability, the energy demand of AI technologies is increasingly causing the coastal region around Fortaleza to emerge as part of global AI infrastructures. Iago Bojczuk thus addresses how existing energy infrastructures that use the abundant hydropower available in coastal regions and local digital communication infrastructures, are shaping the geopolitics of AI in Fortaleza's favour as an undersea cable landing point. Bojczuk's analysis vividly exemplifies how public sector and governmental rhetorics and actions position Fortaleza as a "hub-of-hubs" that can ensure sustainable energy provision in an intensifying AI landscape that requires computing capacity and a clean energy supply. His contribution depicts Fortaleza's geopolitical position as an emerging digital infrastructure hub, where its transformation from one of Brazil's poorest regions is being pushed through state-led policies and geographic advantage that position Brazil as a competitive player in the global AI economy based on its interconnected infrastructures.

Ethical questions about public values and the common good must also be considered when analysing AI's energy demands alongside higher-level questions regarding the interrelation of AI and energy infrastructures, as Julia Velkova argues in her chapter. She analyses problems around energy access and grid capacity shortages related to data centre expansions. Investigating Sweden as a concrete case, she introduces the concept of infrastructure misalignment and demonstrates that an alliance of regional administrations, national grid operators and municipalities endanger the

population's energy supply by upscaling power grids. While Sweden provides a useful example due to its growing number of data centres that are branded as sustainable, questions of the ethical distribution of resources like energy and water emerge across all regions hosting data centres. This chapter invites reflections on the embeddedness of AI infrastructures within a multitude of other infrastructures—energy infrastructures being one of them—which in turn raises question of justice, public values and the common good.

Patrick Brodie meanwhile investigates how big tech corporations frame their AI products as "solutions" to sustainability issues. Taking fish farming as his starting point, he depicts how cloud providers promise to "innovate" cultivation and extraction measures to manage limited planetary resources. Relying on theories of the metabolic rift and political ecology approaches to data, Brodie bridges regimes of datafication with the expansion of green capitalism and its reliance on infrastructures of automations as infrastructures of knowledge. Using machine learning applications to automate feeding or manage disease and parasites within fish farms, AI companies optimise extraction to (presumably) stay within planetary boundaries. As Brodie demonstrates, however, they are thus "materially shaping industrial futures" reliant on complex computing technologies and the few corporations that provide such solutions at scale, "intensifying rather than ameliorating the so-called 'externalities' of capitalist growth".

Promises, Economies, Discourses

In the second part of the book, contributors emphatically demonstrate how AI corporations are shaping narratives of sustainability as a concern solved through technology at the discursive level while also materializing corresponding infrastructures across industries. Taking "Cloud for Sustainability" tools promoted by Microsoft Azure as a starting point, Hamsini Sridharan deconstructs how the company is successfully implementing its cloud application for businesses as an infrastructure of sustainability, but doing so by actively narrowing down sustainability to a matter of data analytics. This approach, argues Sridharan, represents more than a "greenwashing" attempt: it discursively decouples sustainability from capitalism by aligning the current economic status quo with Western environmentalism. In doing so, cloud providers depoliticise sustainability, with lasting effects.

Extending this argument, Salla-Maaria Laaksonen and Meri Frig discuss the power of strategic corporate environmental communication to reinforce the infrastructural power of American big tech corporations while silencing critique. They analyse corporate blogs from the past 24 years and demonstrate how these corporations position themselves as obligatory passage points in sustainability matters. Through a nuanced discussion of the historical evolution of the messages these companies have been advancing through their environmental communication, Laaksonen and Frig demonstrate how large corporations position themselves as infrastructural providers of sustainability solutions while avoiding critique by simply eliminating it from the discourse. The authors call this approach "infrastructural solutionism" and empirically show how it strengthens the perceived legitimacy of big tech as the future providers of solutions for climate issues while simultaneously materializing these futures.

Malgorzata Winiarska-Brodowska shifts the attention of this section from corporate to public and media discourses, focusing on Poland as one of the most developed Central and Eastern European countries in terms of AI application. Poland has traditionally taken an approach of closer alignment to the US technosphere compared to some Western European states, where matters of digital sovereignty have traditionally been more prominent in the interest of promoting their own digital industries. With AI and rising geopolitical tensions undermining traditional global partnerships, questions of sustainability and AI have emerged as military and economic geopolitical concerns for Poland due to the war in Ukraine, making matters of alliance or self-reliance in AI development and application crucial.

Olga Dovbysh adds another layer to the discussion of the discursive production of relations between infrastructures for AI and sustainability by considering the case of Russia's major technology company, Yandex. Based on a visual and discursive analysis of Yandex's sustainability reporting, she reflects on the relevance of sustainability discourses around AI infrastructures in the context of an autocratic regime during its full-scale invasion of a neighbouring territory. While Yandex has considered sustainability reporting important in the past to enable cooperation with Western partners, it now frames sustainability as a matter of technological and ideological sovereignty in a country that is being globally sanctioned. This narrative around sovereignty aligns with depictions of AI as embedded in the progressive, modern lifestyles of Yandex's employees and customers. Dovbysh's analysis highlights sustainability as a matter

of digital self-reliance in Russia that upholds global competitiveness and promises prosperity and progress for its citizens.

Moving towards media and publishing houses, Anne Mollen analyses partnerships between big tech and traditional news production entities and asks how these influence market concentration dynamics. Drawing on a political economy perspective, Mollen's analysis demonstrates the crucial value of news media during the deployment phase of AI systems. She shows how news media become important actors for companies developing generative AI systems as sources for training data, producing presumable authority and trustworthiness of AI-generated content and setting industry standards. News media thus become an instrument of reinforcing monopolisation over the emerging market of AI generated content. Furthermore, Mollen's analysis powerfully shows how relationships between news media and AI companies have not only economic impact, but also affect information access, the distribution and production of knowledge, the constitution of public spheres and environmental issues.

Futures, Politics, Governance

The final section examines epistemological and governance approaches to reimagine futures with computing technologies. In this context, metaphors matter for how we speak about and conceptualise AI and its infrastructures, along with how we govern and project AI-saturated futures. Gerwin van Schie and Inte Gloerich therefore unravel the biological and botanical metaphors in discourses on computation, data, platforms and AI. They argue how classical publications from platform studies effectively rely on tree-focused metaphors to exemplify the entanglements and power dynamics in platform societies. At the same time, they problematise how botanical metaphors naturalise human-made decisions about how AI and platformisation occur and manifest. While media studies have a rich tradition of discussing media ecologies, new metaphors might be needed to re-focus the naturalisation of the use of AI within platform infrastructures. The authors position the sewage system as one possible way to describe both contemporary and projected AI platformisation.

Jędrzej Niklas develops a critical discussion on the role of AI tools in the domain of environmental governance and sustainability. He argues that digital infrastructures should be considered public infrastructures regardless of their ownership because they are crucial agents in mediating

collective and public interests and shaping environmental and ecological priorities. From this perspective, Niklas proposes a normative framework built around the notion of responsiveness that sees the integration of AI and data into environmental governance "as a dynamic process of political, social and technological transformation" grounded on disruptions of the status quo and communal approaches to policy changes. Illustrating this approach with a case from Poland's forestry sector and the use of AI in managing forests, Niklas exposes the tensions catalysed by environmental governance and AI, which land between democratic participation and communal critique, as well as between institutional inertia and the need to include local knowledge and societal voices in large-scale infrastructural transformations.

Dan McQuillan positions "scale" as a key concern of current AI trajectories, which legitimises unfathomable current and future resource demands, projects ideas of unlimited growth through and with AI and advertises capabilities that (presumably) far surpass human facilities. Relying on Ernst Jünger's notion of "total mobilization", the chapter not only deconstructs the narrowed sustainability discussions around AI but explicates how such promissory imaginaries divert vast amounts of capital towards AI-saturated futures and the necessary infrastructures despite AI's very harmful fallibilities, a move that is deeply entangled with far-right, eugenic and anti-democratic politics of Silicon Valley. Corresponding with de-growth approaches, he proposes applying de-computing approaches to the "de-automatisation of social relations and the disentangling of important decisions from AI's reductive outputs".

Further considering alternative, more sustainable computing futures, Fieke Jansen and Niels ten Oever explore the kinds of governance required to constrain infrastructure development for AI within planetary boundaries. Taking an empiric approach informed by participatory action, the authors discuss propositions forwarded by academics, civil society practitioners and policymakers during a series of workshops. Jansen and ten Oever reveal a strong desire among a plurality of European actors to reimagine the role of the state in AI infrastructure governance. An ideal state, they imagine, would promote welfare and democratic values while protecting human rights, societal and environmental justice instead of prioritising a wartime economy and market growth. In these discussions, the role of the state is reimagined as "a regulator, facilitator of different governance approaches and an investor". Such a state, the authors argue, is a prerequisite for a more emancipatory, just computing future.

The book concludes with a discussion of questions about "the good life" in relation to AI as Johanna Sefyrin and Julia Velkova ask what a "good AI infrastructure" could look like. They use the example of a data centre located in Sweden intended to be environmentally sustainable by design. Their analysis reveals that realizing "good AI infrastructures" is not an easy feat as they identify frictions that occur among the imaginaries of different involved actors regarding the integration of this data centre into the region. While Sweden is the focus, their questions about "good" sustainable data centres could be posed regarding any data centre location. Moreover, while the design of a sustainable data centre requires specific measures and practices, the question of how all dimensions of AI infrastructures can be "good" (in the sense of "just") remains highly relevant.

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