Book review of Lindgren, Simon (Ed., 2023). Handbook of critical studies of artificial intelligence. Edward Elgar.

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Introduction

Due to its hard cover, size and weight, this gigantic 940-page Handbook can be used literally as a weapon. The 76 chapters, contributed by 127 authors, also serve as a metaphorical weapon against the irrational exuberance surrounding AI, a phenomenon also observed in higher education (Rudolph et al., 2024). While the book is not focused on AI and higher education, it is an important book on the critically important topic of critical AI studies (pun intended) that it is highly suitable for a review in JALT.

Receiving this impressive tome was like finding myself at the doorstep of the fabled gingerbread house in the Brothers Grimm's haunting tale of Hänsel and Gretel – lost in a huge, foreboding forest, my breadcrumb trail disappeared, standing before a cottage built from confections, after having been abandoned by my parents. This book, much like the witch's cottage, is laden with revelations about the darker sides of AI, ready to devour any naive preconceptions we hold about this technology. Stretching this metaphor a tad further, the volume, however, serves not as a trap but as a beacon of critical theory, challenging us to confront and overthrow the cannibalistic tendencies of witchy Big Tech. In this analogy, the book embodies Gretel's cunning courage, enabling us to shove the menacing forces of unchecked technological advance into the oven, incinerating its malevolent underpinnings and illuminating a path toward a more critical understanding of AI.

Impressively, the Handbook has a single editor, Simon Lindgren, a Professor of Sociology and a Director of the DIGSUM Centre for Digital Social Research at Umeå University, Sweden. Lindgren's Handbook gathers cutting-edge insights from scholars across a wide variety of disciplines with a sense of urgency. It critically examines AI's expanding influence in society and culture and broadens the discussion beyond mere technological aspects by thematising AI's social, ethical, and political impacts. Covering key issues such as biases within AI systems, effects on democracy, privacy concerns, and its role in decision-making, the book advocates for a rigorous critique of AI. Lindgren's Handbook significantly succeeds in enriching the debate on critical AI
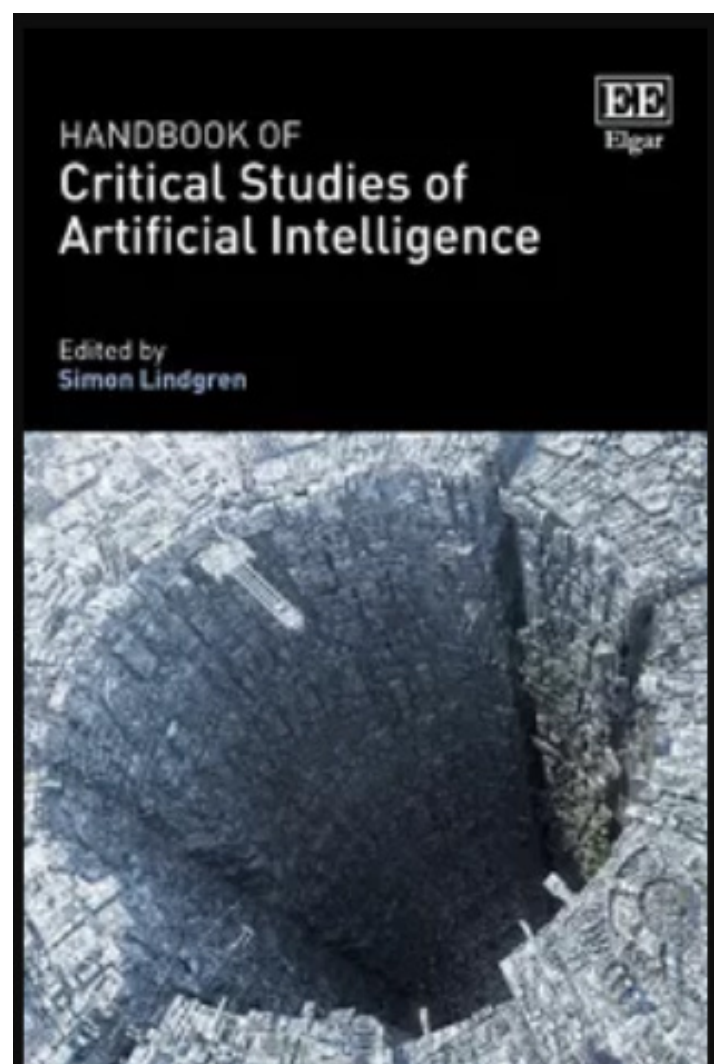

Figure 1: Book cover of Lindgren (Ed., 2023).

studies, posing significant questions, and introducing vital concepts for analysis.

In Lindberg's excellent introductory chapter, he rightly highlights that much of the work that has been done on AI is not critical enough and "critical perspectives of the technology are more urgent than ever" (p. 1).

The rationale behind this handbook is that we need to push analyses of AI much further into critical territory than what is the case today. The handbook wants to contribute to an ongoing discussion about what critical studies of AI can entail – what questions it may pose, and what concepts it can offer to address them (p. 4).

At present, we are surrounded by so much hype and mania based on techno-optimism and solutionism (Rudolph et al., 2024). We experience "an almost perverse obsession with artificial intelligence" (Kotasek, p. 254). AI promises to revolutionise "science, automatically detect various health issues, eliminate hate speech and misinformation, and prevent crimes" (Jobin & Katzenbach, p. 43). AI is also seen "as the solution to society's problems, including climate change, pandemics and the energy crisis" (Verdegem, p. 302). Brevini (Chapter 75) points out that AI technologies have become such integral parts of our daily routines that they often go unnoticed, permeating every socially, politically, and economically significant sector. Examples include AI-driven traffic management cameras, facial recognition systems at airports, smartphone apps that suggest music videos on YouTube, and smart homes operated by Amazon's Alexa. In the Handbook's critical perspectives, Lindgren and his army of authors are influenced by the critical theory of the Frankfurt School. Horkheimer (1972) conceptualised critical theory as the radical analysis of present socio-economic conditions so that the research can be a liberating influence with an emancipatory agenda to create a world which satisfies the needs of humans.

In his introductory chapter, Lindgren makes many excellent observations about AI. One of the starting points is Crawford's (2021, p. 8) succinct observation that "AI is neither artificial nor intelligent" and that "AI is politics by other means". It is of critical importance to highlight that 'artificial intelligence' is a highly problematic and loaded concept despite its seemingly magical advantages. AI is a marketing label vulnerable to exploitation and exaggeration, and Lindgren has posited elsewhere that "AI is driven by myths that animate it as magic" (2024, p. 94). In his introduction, Lindgren (p. 17) further states that AI, being "the subject of evolving wars of definitions", is an *empty signifier*", a "*ubiquitous apparatus*... entangled with human experience", and "part of the *technological unconscious*". AI is an ideology-driven, socio-political mythology, "constantly repeated and performed in marketing talk, hyped-up conferences, tech evangelism, business manifestos, and overblown media reporting" (p. 17).

The tome is organised into seven parts: (1) AI and critical theory: Conceptual discussions, (2) AI imaginaries and discourses, (3) the political economy of AI: datafication and surveillance, (4) AI transparency: ethics and regulation, (5) AI bias, normativity and discrimination, (6) politics and activism in AI, and (7) AI and automation in society. Unfortunately, space limitations render it impossible to do justice to every single chapter of the book. I will provide an overview of all of its seven parts, cherry-pick some of my favourite chapters (of which there are many), and paint in broad strokes before concluding with a critical appraisal.

AI and critical theory: Conceptual discussions

The first part of the Handbook focuses on conceptual issues related to critically analysing AI through academic research. 15 chapters dive into conceptual issues surrounding AI, exploring its relationship with politics, ideology, governance, and a host of other concepts like antagonism, epistemology, and (de)coloniality. They critically examine AI's integration into society, its governance, and the ideological underpinnings it perpetuates within the capitalist framework. Overall, the Handbook's first section urges a re-evaluation of many of the AI-related conceptual dimensions.

Bloom's chapter (3) laments that current AI regulations leave "Big Tech virtually unscathed", as they lack "a focus on those affected by AI systems, apparently missing any general requirement to inform people who are subjected to algorithmic assessment" (MacCarthy & Propp, 2021, cited in p. 33). This chapter also contains some thought-provoking perspectives on 21st-century robots as slaves. Bloom cites Hampton (2015, p. 2):

> Slavery... was largely invested in producing and controlling a labor force, which was disassociated from humanity. In many regards, American slavery was a failed experiment to employ flesh and blood machines as household appliance[s], farm equipment, sex toys, and various tools of industry without the benefit of human and civil rights... The technology of the 21st century is in the process of developing a modern-day socially accepted slave (cited on p. 39).

Chiodo's chapter (6) contains a fabulous passage that shows how AI usurps divine dimensions by being "immanently omnipresent, omniscient, omnipotent and inscrutable": "omnipresence (by being everywhere: it is always with us), omniscience (by knowing everything, from the answers to our questions to ourselves by tracking us), omnipotence (by increasingly having power over us, from shaping our worldviews to shaping our decisions and actions accordingly) and inscrutability (algorithms as black boxes)" (p. 76).

Birhane and Talat conclude their chapter (11) by showcasing the Te Hiku NLP project as an instance of decolonial AI. This initiative involved vast numbers of Te Reo Māori speakers in Aotearoa/New Zealand engaging collectively in the creation of AI technologies aimed at revitalising their endangered language. Over a span of ten days, the Te Hiku NLP project gathered 310 hours of spoken language and corresponding text from 200,000 recordings by 2,500 participants. This extensive dataset enabled the development of a speech recognition model with an 86% accuracy rate, driven by a desire to safeguard Māori culture and language. The success of the Te Hiku project in Te Reo Māori demonstrates the potential for machine learning systems to contribute to decolonisation efforts.

AI imaginaries and discourses

> AI is not only a technology, but also a story. (Coeckelbergh, 2021, p. 1626)

The Handbook's second part addresses the social and symbolic framing of AI and its connection to ideology. At present, AI occupies a central role in a broad spectrum of social and political imaginings, ranging from utopian dreams to dystopian fears. These imaginings typically emphasise notions of progress, profit, precision, and rationality while grappling with fears of robot-led catastrophes and disenchantment. AI shapes our perception of reality and the kinds of future lives and societies we deem achievable. Lagerkvist (2020, p. 16) states that "In the present age, AI emerges as both a medium for and a message about (or even from) the future, eclipsing all other possible prospects" (cited on p. 7).

The "AI imaginaries and discourses" section consists of nine chapters and is propelled by ideas often tied to societal power dynamics, which are usually portrayed as unbiased truths and objectives. These ideas commonly include faith in technology's salvational potential and the propensity to defer crucial decisions to inscrutable automated systems. The risk lies in accepting these views and priorities as infallible. The alternative proposed is a shift towards democratic decision-making and a thorough critique of AI's societal impact.

In Chapter 19, Kajava and Sawhney advise against the common practice in popular science and culture of attributing exaggerated human-like qualities to AI, such as *learning, training,* or *memory,* and using hyperbole. They highlight that AI technologies are often inaccurately described as possessing human-like agency or autonomy, a misconception stemming from equating machine *behaviour* with human action (Searle, 1992). Kajava and Sawhney note the confusion arising from attributing autonomy, agency, or sentience to machine behaviour. Following Rehak (2021), they suggest eliminating the use of terms such as 'agency' and 'autonomy' in discussions about AI due to their potential for inaccuracy and misleading implications. Instead, they call to refocus attention on the human responsibility inherent in AI's creation, deployment, and oversight.

In Chapter 20, Ballatore and Natale critique the conventional 'rise and fall' narrative used to describe AI's history, where periods of enthusiasm ('summers') alternate with times of disappointment ('winters'). They suggest a reinterpretation that consistently recognises the role of controversy and scepticism in shaping AI's development rather than viewing it as a sequence of distinct optimistic or pessimistic phases. This perspective reveals that doubts and debates have persistently accompanied AI from its inception in the 1950s to today, challenging the simplistic narrative of technological progress. They advocate for a critical examination of AI that considers failures and controversies as central to understanding its evolution. This approach serves as a corrective to current discussions about AI, underlining both its potential and its limitations, and attacks the long-held myth of machines capable of thinking like humans. It is worth remembering that Alan Turing (1950) considered the question 'Can machines think' "too meaningless to deserve discussion".

Verdicchio's chapter (21) makes a compelling distinction between 'artificial' and human intelligence and challenges the idea that intelligence can be fully captured in precise, machine-compatible descriptions. He supports Gardner's (1983) concept of multiple intelligences, which categorises human intelligence into eight distinct types: visual-spatial, linguistic-verbal, logical-mathematical, bodily-kinaesthetic, musical, interpersonal, intrapersonal, and naturalistic. Verdicchio points out that in the pursuit of Artificial General Intelligence (AGI), the objective is highly ambitious: to translate every task humans are capable of – encompassing Gardner's entire spectrum of intelligences – into computational terms that machines can perform.

I would be remiss not to briefly mention Lina Rahm's excellent chapter (25) on "Educational imaginaries of AI". Rahm's chapter explores and questions the construction of knowledge regarding AI within international education and AI ethics policies and examines the social, political, and epistemic implications of this knowledge. Her chapter's "purpose is to support the development of critically reflexive and just education policies about AI futures" (p. 289).

The political economy of AI: Datafication and surveillance

> [D]omination perpetuates and extends itself not only through technology but as technology, and the latter provides the great legitimation of the expanding political power, which absorbs all spheres of culture. (Herbert Marcuse, cited in Timcke, p. 323)

The Handbook's third part contains eight chapters that explore the political economy of AI, particularly how AI and automation, in their deployment and outcomes, intersect with societal structures of dominance and exploitation, especially regarding capital and labour. Lindgren posits that critical examinations of AI should consider the social, political, and economic contexts surrounding the technology, along with its effects on these areas. It is essential to recognise that technology is inherently intertwined with the political economy. Consequently, it should not be viewed as independent from society.

Timcke (Chapter 28) reminds us that at the close of the last century, there was widespread optimism among various groups, from Habermasian scholars enthusiastic about the potential for a rejuvenated public sphere to techno-libertarians eager to explore new forms of non-state governance. This optimism was rooted in the digital revolution, with beliefs that the adoption of free software and a shift away from private property rights would lead to a new era of *homesteading on the electronic frontier* (Rheingold, 1994). However, reality has unfolded differently: capitalist agendas have increasingly restricted and dominated digital spaces. Timcke turns to the seldom-invoked Marxist concept of reification to argue that the deepening of capitalist social relations has significantly narrowed the possibilities for imagining life beyond these confines. This intensification of capitalist ideology has not only strengthened its influence but also fostered its acceptance among workers themselves, suggesting a profound shift in societal reasoning towards capitalist logic.

AI transparency, ethics and regulation

> Technological progress cannot count as progress without social evaluations of what it is good for, who benefits from it, and what costs it generates... progress is a reflexive concept; every progressive process must be constantly questioned as to whether it is in the social interest – correctly understood – of those who are part of this process. Thus, every criticism is itself also part of progress. (Forst, 2017, pp. 72-73, cited on p. 400)

The Handbook's fourth part focuses on ethics and regulation. In his introductory chapter, Lindgren mentions that researchers in critical AI studies might view areas such as "ethical AI" and "responsible AI" as insufficiently critical. However, critical theory faces a significant challenge in enhancing AI ethics rather than simply critiquing it. There certainly is much to be critical about. For instance, in Chapter 47, Albert and Delano state that much research on AI ethics is "shallow and unspecific, focusing on hypothetical or abstract potential harms rather than the specific impacts on particular groups" (p. 538).

Resseguier (Chapter 35) emphasises the lasting value of ethical ideals such as dignity, fairness, privacy and transparency. The best way to bring about these ideals may be to recognise the 'nonideal'. The near-impossible challenge is to ensure that these high-level principles are implemented for all.

Lee et al. (Chapter 36) remind us that the AI arms race – the competitive desire to create more powerful AI – facilitates harms that disproportionately impact marginalised groups by encouraging the development of insufficiently vetted AI systems. AI regulation faces fragmentation due to competitive dynamics, the push for innovation, the varied applications of AI, and its technical complexities. This means that creating uniform regulations would be impractical. Lee et al. argue that regulation must be adaptive and acknowledge divergent perspectives, social and technical constraints, and power disparities. Ignoring these 'fractures' will only make AI governance harder.

Carabantes highlights Burrell's (2016) framework, illustrating that AI's opacity stems from three main layers. First, AI's complexity is intentionally enhanced - using methods that prioritise performance over transparency. Secondly, its workings are kept secret by businesses and governments to safeguard their algorithms, competitive edge, and reputation, leveraging legal protections. Third, the advanced nature of AI technology makes it inaccessible to the general population. This opacity primarily serves the interests of powerful entities that utilise AI for surveillance, influence, and financial gain. Furthermore, Big Tech employs AI to subtly guide behaviour towards certain outcomes, a strategy unlikely to diminish, suggesting an expected rise in surveillance and manipulation through AI.

AI bias, normativity and discrimination

When AI models exhibit stereotypes, discrimination, and exclusion, the models are not inherently at fault, as they mirror the societal values prevalent in the context where they were developed. Rather than originating these values, the models are shaped by them and can further propagate and mask their societal roots. Machine learning models absorb and reflect the language and thought processes of their surrounding society, influencing it through their application. Bias, normativity, and discrimination will persist in models as long as these issues are present in the society from which the models learn.

Pop Stefanija (Chapter 49) shares her research into the data that a number of digital technology companies hold about her:

> It demonstrated how little we know about who holds data about us, why they hold that data, and what they do with it. Crucially, it showed that, while there are ways to obtain information, to *make the invisible visible*, there are almost no ways of knowing how that data might and will affect us, or how to act agentially once information is obtained (p. 563).

Pop Stefania argues that it is crucial to remember that not all problems are suited for technological solutions, especially those stemming from deep-seated systemic power imbalances, which demand systemic responses rather than technical fixes. Before turning to AI for answers, we must first consider whether it is appropriate to involve AI in the decision-making process. Even if a computer suggests it is, we must retain the ability to challenge its authority and decisions. This includes questioning the rationale behind its outputs and, importantly, having the power to reject or alter its recommendations.

Brown (Chapter 50) intriguingly argues that the apparent absence of race in virtual assistants actually emphasises racial differences by ignoring non-white identities, which alienates users of colour while catering to the assumed preferences of white users. This approach to designing gendered and racialised tech products generates "the false possibility" of imagining an equitable, post-work world without first tackling the existing inequalities rooted in gendered and racialised divisions of labour (p. 581).

Politics and activism in AI

The sixth and penultimate section of the Handbook deals with issues of politics, activism, and AI. It is the shortest section, with only five chapters. Eriksson's chapter (58) is one of several that deals with automation and the future of work. It focuses on the Swedish automation debate. Eriksson makes the important point that critical AI analysts need to urgently reflect on automation. This begins with debunking the myth that technological progress is an unstoppable force beyond our control and acknowledging the fundamental importance of politics.

Holzapfel's chapter (60) is titled "Introducing political ecology of creative-Ai". The author discusses various "creative support tools" and how they have been used in various art forms, such as music and literature (p. 691). He reminds us that a team of music historians, musicologists, composers, and computer scientists spent years preparing data and designing AI models to complete Beethoven's 10th Symphony.

AI and automation in society

> Technology is not necessarily good, nor bad; nor is it neutral. (Kranzberg, 1986, p. 545, cited on p. 726)

The final part of this Handbook encompasses a variety of chapters that apply a critical perspective to explore diverse realms and situations involving the development, usage, or deployment of AI. Lindberg's vision for these chapters is to collectively provide a thorough review of the present landscape of AI and automation within society and highlight ways it can be subject to critical examination.

Parviainen (Chapter 69) amuses us by reminding us of the disastrous launch of Mistubishi's Wakamaru domestic robot that did not lead to a single sale. Although there is a widespread belief that AI-powered robots will transform caregiving, their impact on nursing remains limited. Currently used technologies include monitoring devices, automated medication dispensers, robotic pets, mobile telepresence tools, and logistics support in hospitals. However, these devices mainly perform basic, routine interactions or simple repetitive tasks and are not equipped for complex multitasking or assisting with daily activities. I will mention in passing that Schiff and Rosenberg-Kima (Chapter 70) provide a useful overview of key milestones in the history of artificial intelligence in education (AIED) and AI.

Brevini (Chapter 75) adopts a comprehensive approach to AI's lifecycle that reveals its significant ecological costs. The process begins with the extraction of rare metals and minerals, critical for AI hardware, linked to technocolonialism and resulting in environmental and social harm, including damaged ecosystems and loss of biodiversity. (Technocolonialism is Madianou's (2019) term that refers to the convergence of digital developments with humanitarian structures, state power and market forces and the extent to which they reinvigorate and rework colonial genealogies.) AI production and operation further strain the environment through high energy use, emissions, and electronic waste, with cloud computing's carbon footprint notably exceeding that of the airline industry. Additionally, AI systems' water use for cooling data centres adds to their ecological impact. The cycle ends with the disposal of electronic waste, disproportionately affecting developing countries. This lifecycle analysis highlights the urgent need for sustainable and equitable AI practices, challenging both Big Tech and governments to address the environmental consequences of AI.

Critique and conclusion

While some may find meta-critical thinking tiresome, critical theorists such as Marcuse and Angela Davis stress the importance of critical theory being critical of itself (Davis, 1989; Brookfield et al., 2024). In this spirit, some critical remarks can be made. The trouble with academic books is similar to that of journal articles: they lag behind what's happening. Consequently, generative AI does not have much presence in this Handbook; for instance, the index mentions ChatGPT only once.

Of the 127 authors, 123 are based in Western countries, and only two are based in South Africa and one in Japan and India each. Hence, the critique of Westocentrism or Eurocentrism could be considered. However, the difficulties in getting critical theory contributions on AI from non-Western countries must be considerable. In fact, Okolo's chapter (33) discusses the global inequality in AI and machine learning (ML) publications: Latin American, African and Southeast Asian countries are far behind the top publishing nations. It appears more problematic that there is no contribution from China, an AI superpower, and there are few mentions of China (the index claims that there is only one page (p. 217) that discusses China).

The Handbook's writing may, on occasion, be difficult to penetrate for readers who are not well-versed in critical theory, sociology and philosophy. In my view, that's okay, and there is no need to dumb down the Handbook's challenging topics. Einstein famously paraphrased Occam's Razor by saying that everything should be made as simple as possible, but not simpler. He emphasised the importance of simplicity in understanding complex ideas. Einstein's advice may not have been followed in the Handbook, and matters are occasionally portrayed in a more complex way than necessary. However, the cardinal sin of putting simple ideas into difficult language is rarely committed. More often than not, complex ideas are conveyed in difficult language. Helen Sword's advice, with which I struggle myself, is that stylish academic writers should gravitate toward "complex ideas communicated in clear, comprehensible language" (Sword, 2017, p. 152; see Green, 2009).

Finally, the book's price is the elephant in the room of this review. Given the Handbook's gargantuan size, it is, unsurprisingly, not a cheap book. However, it is laudable that the publisher, Edward Elgar, has not only made this Handbook available at the normal hardback price of £310 (the Edward Elgar membership price is £279), but e-book options for individuals start at a much more palatable £48. The book may be expensive, but there is enough material for weeks or even months of intensive reading in it. While it would be unethical to copy it, you could recommend it to your university or national library or share your copy with friends and colleagues.

In any event, I highly and unreservedly recommend this excellent Handbook. It emerges as an indispensable text for those immersed in digital sociology, science and technology studies and blends rich theoretical insights with empirical analyses. It is a vital resource for anyone keen to critically explore the complex relationship between AI and society.

Lindgren's Handbook serves as a critical guide for postgraduate students, scholars, practitioners, developers, and policymakers who want to acquire a deeper appreciation of the socio-political landscape of AI. In an era where the discourse around AI ethics often aligns with the interests of Big Tech, adopting a critical perspective toward AI becomes imperative. The Handbook's 76 chapters address a wide array of topics, from the political economy to socio-technological narratives and activism and present a critical exploration of AI's entanglement with social structures and power dynamics. It stands as a counter to the prevailing ideologies of technological optimism and solutionism, advocating for the development of technology that fosters, rather than hinders, societal well-being and communal harmony. Lindgren's Handbook not only aids in comprehending the current state of AI but also supports the critical and interdisciplinary endeavour to create technology that enhances collective welfare.

If you cannot access or afford the book or you are intimidated by its epic length, there are excellent, thinner and more affordable books that are critical on AI. Three of my favourites are Simon Lindgren's *Critical theory of AI* (2024), Kate Crawford's *Atlas of AI* (2021) and Stefan Popenici's *Artificial Intelligence and learning futures* (2023; see Rudolph, 2023).

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