MAIN PAPER

Towards a decolonial I in AI: mapping the pervasive effects of artificial intelligence on the art ecosystem

Amir Baradaran[1]

Abstract

This paper delves into the intricate relationship between Artificial Intelligence (AI) and the art ecosystem, emphasizing the need for a decolonizing approach in the face of AI's growing influence. It argues that the development of AI is not just a technological leap but also a significant cultural and societal moment, akin to the advent of moving images that Walter Benjamin famously analyzed. The paper examines how AI, particularly in its current oligarchical and corporate-driven form, perpetuates and magnifies the existing social inequalities, thereby necessitating a critical and radical rethinking of its role in society and the arts. At the heart of the discussion is the concept of AI as a broad term encompassing various forms of machine intelligence, from natural language processing to computer vision. The paper criticizes the dominant anthropocentric view of intelligence and creativity, proposing a more inclusive approach that considers the diverse forms of intelligence present in other species and potentially in AI itself. It underscores the role of AI in shaping the art ecosystem, not just in the creative process but also in gatekeeping and decision-making. The paper proposes a framework for decolonizing AI in the art ecosystem, focusing on four key tasks: recognizing access as a form of power, understanding and addressing biases inherent in AI, assessing the impact of AI on marginalized communities, and challenging dominant narratives and epistemologies to create space for alternative voices and perspectives. It emphasizes the need for artists and the art community to engage actively with AI, shaping its development towards more equitable and just outcomes. In conclusion, the paper calls for a radical reimagination of AI's role in society and the arts, advocating for a future where AI is not just about technological advancement but also about fostering a more inclusive, equitable, and creatively diverse world. It invites artists, thinkers, and innovators to join in this journey of reimagining and reshaping the future of AI and the art ecosystem.

"Artificial Intelligence promises drastic changes in every corner of our world. The art world is no different. There's a massive gap between high-level conversations about the potential to merge art and technology, and what's actually happening on the ground. Major challenges abound on all sides. Artists are alienated by emerging technologies. Technologists are advancing the field without sufficient critical and social engagement. Institutional stakeholders are resistant to the realities of imminent AI related paradigm shifts. It's time to do something about it."

Another AI in Art Summit Catalog (2019)

✉ Amir Baradaran
  amir@abxrengine.com

[1] ABXR Engine, New York, USA

1 How this edited special issue came about

Over a century ago, the technology of moving images catalyzed critical thought about art, technology, and society; here, I'm thinking of Walter Benjamin's seminal "The Work of Art in the Age of Mechanical Reproduction." I see the development of Artificial Intelligence (AI) as a similarly urgent historical moment, calling us to such profound discussions. While inequalities continue to grow in our societies, human-made technologies, if unchecked, have been shown to reproduce and exacerbate them. When these structural inequalities congeal in the forms of AI, their implications are grossly magnified to scales ever harmful to those most excluded from the main avenues of power. In this context, we ought to seek radical visions of the future in which harmful techno-economic and epistemological structures are taken to task. We need radical futures that favor critical thinking

and creative research as ways of learning, creating, and sharing knowledge. As artists and art professionals, we have a unique position to be(come) critical thinkers and astutely proactive to technological shifts in our societies. But, as artists, we can only do so if we know, understand, and have the privilege, and access, to use these technologies. If this is the case, how can we, as artists, reclaim our role within technological movements currently shaping our futures?

In this context, in the Spring of 2019, I organized AnotherAI.art: Decolonizing Art Ecosystem Summit proved to be one of the earliest in person platforms that facilitated the gathering of over 80 thinkers and practitioners of the field to address gaps, challenges, and opportunities at the intersection of critical inquiry, art making, and artificial intelligence. Co- hosted by the New Museum, the Knight Foundation, and Columbia University School of Engineering and Applied Sciences, Victoria Vesna proposed our special issue during this Summit. We are publishing the Summit's White Paper in its entirety as its own chapter in this special edition as a means to tell the story of this unique gathering and to incorporate the voices of those who so actively participated in it and contributed to some of the ideas that are hashed out in this introduction.

The concept of decolonization offers the theoretical framework in which power can be challenged in the context of emerging AI and related technologies. For this special edition, we sought submissions in the form of critical reflections, research articles, and opinion pieces from a diverse and interdisciplinary group of artists and other art professionals, scholars, policymakers, and technologists, particularly from those who are BIPOC. Contributors were invited to grapple with questions of access, agency, and equity concerning AI and its impact on the art ecosystem, including the encoding of bias and the (digital) marginalization of various social groups, including but not limited to people of color, immigrants, and women.

2 The current AI ecosystem

Artificial Intelligence (AI) has, in many ways, become an index for our technological dreams and nightmares: our utopian hopes for transcendence as well as our dystopian visions of monstrosity. Fearing technology's negative potential is nothing new: from Mary Shelley's Frankenstein (1818) to more recent concerns about ChatGPT and to state-sponsored surveillance and robotic warfare. AI brings new dimensions to that fear, embodied through well-established science fiction tropes of machine consciousness and annihilation of the human species. But also more immediate concerns about the capacity of new kinds of hardware and software to reproduce systems of inequity with previously unimaginable scale, scope, and speed. In fact, decades of neoliberal policies that

advocated for market sovereignty, corporate interest, fewer overseeing agencies, and smaller governments have turned the tech industry into an oligarchical economy. The capital-intensive nature of the AI industry, in addition to the political economy that left the data industry unchecked, has led to an ecosystem that is characterized by an unprecedented concentration of wealth and technological knowledge. In this context, we must ask ourselves: how can we reclaim our collective human agency in shaping the technology itself and affecting the stories that machines implicitly and explicitly tell about us?

AI can mean many things. I use it as an umbrella term to refer to machines capable of applying intelligence to solve very specific sets of problems, such as natural language processing and understanding (NLP/NLU) or computer vision (CV). Also known as Narrow AI, this field of research marks a difference between AI as it exists now and its future as something general and free from the bonds of its human engineers (Pennachin and Goertzel 2007). 'Artificial General Intelligence' (AGI), on the other hand, is the expression used to describe the kind of free-thinking, independently acting machines often portrayed in novels and cinema.

While the creation of AGI may still remain within the realm of fantasy, we must reckon with the fact that we have come a long way from the early days of digital automation. In fact, moving from supervised to semi-supervised, unsupervised, and reinforcement learning methods, current developments in machine learning (ML) have allowed systems to learn from different types of datasets. Additionally, using several layers of neural networks, deep learning (DL) has permitted systems to analyze large datasets and, subsequently, generate new content. While predictive AI analyzes data to predict future events, generative AI utilizes existing data to create new content or synthetic data. ChatGPT, for example, is a natural language processing tool that uses DL techniques to generate conversation through text, while Dall-E and AmperMusic generate images and music, respectively.

Mapping the recursive nature of the ecosystem allows us to identify the exponentially paramount significance of the role we have played as producers of the raw data, which has become and continues to be a core component of the AI technology itself.

In the current AI ecosystem (see Fig. 1), to train its machines, big tech relies on two forms of raw material or 'input' as it collects our digital information, and personal data. First is Voluntary Input, which is based on our active labor and conscious information sharing. This is the case when we willingly download an app and create an account or ask our Google Home to play music. The second is Exploitative Input, which is based on passive labor, using involuntary and untold methods of extraction. This is the case when your phone records your facial expression without your consent.

Fig. 1 Current AI ecosystem: input & output
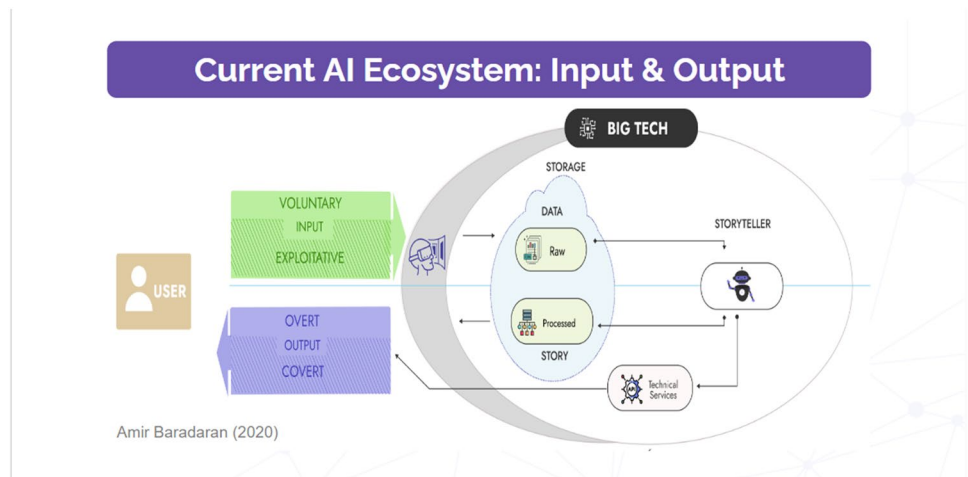
Exploitative input is often larger in size and is considered to be more precious than voluntary input (Fig. 1).

Both inputs are kept inside proprietary data storage and are used for the following two purposes. (1) Maintenance and improvement of the Storyteller. Also known as the black box, the Storyteller refers to the algorithmic models that can improve itself through a recursive process of learning. This can happen via supervised and unsupervised learning. (2) Creation of Stories, also known as processed data, through analysis, interpretation, and other techniques that are performed by the machine that I call the Storyteller. The rampant AI race requires massive amounts of data that can only be achieved through the digitalization of our lives. Somewhere between our unchallenged adherence to the hegemonic power of consumerism, late capitalism's planned obsolescence, human hunger for innovation, and our ever-green desire to improve the (perceived) quality of our life reside the explanation of an exponential digitalization of every aspect of our lives. Given our mainstream adoption of digital screens, browsers, emails, social media, voice commands, smartphones and watches, and autonomous cars, it is not an exaggeration to say machines are already in training to become the storytellers of our collective lives.

Now try to imagine the implications of a similar adoption for spatial computing technology, also known as virtual reality (VR), augmented reality (AR), or extended reality (XR). In fact, given the astronomical budget that the tech industry has spent in recent years and its exponential projections for the near future, it is safe to say that mainstreaming of extended reality wearables (glasses or even contact lenses) is simply a matter of when rather than if. These devices will inevitably exacerbate the scale and scope of data that will be collected. I would even argue that the much anticipated new era of wearables will depend on the existence of augmented human informants whose bodies, ironically, serve as an extension of the very machines that are created to serve them. This is what I call Spatial AI. Now consider the scale and scope of the data we will generate through spatial computing. These machines are built to see what we see, listen to what we hear, move with and through us inside every space that we inhabit, know our biometrics better than ourselves, and could ultimately smell and taste for us before we even realize. The convergence of all these narrow AI capabilities will undoubtedly amount to something greater than the sum of their separate parts.

In recent years, many of my colleagues and I have argued for replacing the term "Users" with "Citizen-Users" to claim our collective agency within the current technological discourse of AI. However, given the unprecedented speed with which Spatial AI technology is growing, we need to further complicate our understanding of the entire system and the role we, as humans, play in it. As such, I propose the term Digizen Producers to create the necessary conceptual space to allow us to further critique the techno-economic forces at stake.

How can we quantify and compare the value of the amount of data that is extracted from our everyday lives in creating and improving AI knowledge? Subsequently, how can we compare the value of our input with the type of AI-enabled services that are provided to us? For example, should we be asked to pay, or be paid, for using Uber transportation services or dating apps such as Grindr or Tinder? It may be true that in some cases sharing our data is a fair price to pay to have access to AI-enabled services that are provided to us free of charge. However, it may not always be a fair transaction. For one, while the majority of leading technology companies in the world are held privately, it must be noted that the bulk of the technological advancement that facilitated access to what we know as the pillars of the data industry, such as the internet, cloud computation, hardware, and software capabilities started as government-funded projects. In addition, It is often difficult to gauge the value of the exchange between the data shared and the services provided.

Although we can always start by accounting for the profits made through the AI-enabled targeted advertising industry, sharing our raw and processed data with third parties is only one small portion of the revenues generated through the services we use. AI companies also market, sell, and profit from the technological knowledge they produce. For example, Facebook and Microsoft compete in marketing their improved computer vision capabilities for better facial detection functionalities for example. While Google and Amazon may compete for cloud computation, OpenAI (recently acquired by Microsoft) is leading the way with its NLP generative AI and for communicating through chatbots.

Given the oligopolistic nature of the AI market as we know it and considering how homogeneous the population that owns and financially benefits from these industries, the question begs itself: As digizen producers, how can we decolonise the AI ecosystem to claim ownership over not only the data we willingly produce but also the unaccounted cost of being alive, as well as the labor we put into living our everyday lives?

3 The role of the artist and art ecosystem: shaping the future of AI

3.1 Design requirements of technological equity

To date, most solutions proposed to counter current and future challenges of AI have come from the realms of law and, in recent years, expanded to encompass governance more broadly. While it might be hoped that governance solutions would include attention to designing the interfaces that mediate contact between components of the ecosystem, in truth, design questions are rarely asked by those invested in arguing for equity and justice in AI. Such attitudes are incredibly counterproductive as design concepts not only inform usability and utility but also establish user journeys along with the structures that create (and limit) norms, practices, and outcomes, while concurrently giving birth to diverse forms of hardware, software, and data all together. Design is reflexively entangled with all aspects of our experience. It should certainly not be ignored, especially when addressing power dynamics that are at stake in any given technological environment. Design impacts both the dynamics and the forms that power takes within a system, thus controlling how we negotiate our way as we navigate through the system.

There are two central explanations for such flagrant omission. For one, the hyperspecialization of education has, in many ways, limited the imagination of coders, lawyers, theorists, policy experts, and scholars in that it fails to introduce them to ideas beyond their specialty. For two, the lack of interdisciplinary collaborations, although tightly linked to

the issue of hyperspecialization, is an issue in its own right, reflecting a siloed approach in framing AI in very strict governance terms. By working only ever within their respective disciplines, key thinkers fail to identify and embrace the interconnectedness of all things required to rethink AI. These two issues work in tandem and have produced a largely piecemeal response to AI, keenly demonstrated in the yet-untapped potential of design to inform most proposed policy reforms and regulations. A systems-level, 'big picture' approach is desperately needed, and while it may be difficult to remake the entire education system, it is entirely possible to bring diverse interdisciplinary experts together to engage in critical ideation.

Ironically, the technological oligarchy that controls AI continues to pay considerable attention to design, investing heavily in user interface and experience (UI/UX). Highly aware of the data economy and driven by corporate demands for ever-increasing user adoption, the industry rightly recognizes design as an integral part of its solution. It is, therefore, unsurprising that one study estimates the return of investment for UX in the private sector to be a staggering 9900%; attention to design is so important that the CEO of Intechnic recently described UX as "a matter of survival" for technology products. The significance of UI/UX becomes even more striking as we contemplate AI's move from the cloud to edge technologies and algorithmic localization that, more than ever before, will demand new and highly responsive design features.

The ways these challenges are addressed will inform how AI is developed and used in turn. Further, neither technology nor design exists in a vacuum, and neither are apolitical projects. Given their inherent interconnectedness, it follows that intentional interdisciplinary and intersectional engagement is necessary when seeking to achieve meaningful equity and justice.

3.2 The creative I in AI: a conscious move towards AGI

For AGI to become a reality, there are three main themes of questions that must be answered (Pennachin and Goertzel 2007; Russell and Norvig 2003). The first theme relates to the nature of intelligence itself. What is intelligence, and what constitutes its core components? We might also ask if intelligence requires a state of consciousness: Does it have to be self-aware and able to self-reference? What about logic and critical thinking? Specific to art and art making, this line of inquiry also invites us to question the nature of creativity. Is intelligence defined through the capacity to generate original ideas, and what defines creativity itself? These essential questions are not easily answered even within an entirely human model but approaching them is necessary for the conceptualization and ultimate generation of AGI.

The first raft of questions gives rise to the second theme of inquiry, which critiques an anthropocentric (i.e., human-centered) understanding of intelligence. My previous questions situated intelligence—and by extension, creativity, critical thinking, logic, agency, and consciousness—relative to a very human understanding of what it means to be intelligent. Is that enough? In what ways does human intelligence differ from other species? Ants and bees, for example, seem to operate with a kind of collective intelligence that feels very much at odds with our experience of intelligence as humans, and these are only two examples. Undoubtedly, countless more invite reflection on the multitude of diverse and alien forms of intelligence that exist currently, of which we are primarily unfamiliar and unaware. To realize AGI, we need to decenter humans in conceptualizing and enacting intelligence.

The third line of inquiry centers on a very big question: How is intelligence created in the first place? In some ways, posing answers to the first two themes of inquiry can help guide this third theme, but there is more to it than defining the nature of intelligence, even in non- anthropocentric terms. Do humans actually have the capacity to create intelligence, and if so, what are the ways in which it can be achieved? Is our only chance of, or hope for, creating intelligent machines to do so, as George Zardakakis (2015) asked, "in our own image?".

These lines of inquiry are not entirely new. Zardakakis and others have been asking for variations of them for some time, but they demonstrate the inherent complexities of creating AGI that extend well beyond technological know-how. As such questions are prodded forward by the promise of AGI, it is undoubtedly that whatever answers are produced will reshape our sense of selves and, by extension, art and art making. Intelligence, creativity, and agency are all at the very heart of AGI as well as how we understand the essence of artistic creation. Beyond attention to who (or what) creates art, AGI offers to destabilize the art ecosystem as a whole: from being to becoming, conception to creation, to consumption, gatekeeping, and beyond.

4 Mapping AI's impact on the overall art ecosystem

AI has, in various ways, already infiltrated the art ecosystem. However, most of the conversations about the impact of AI on the art ecosystem have been centered around the creative process. It is essential that we shed light on the pervasive nature of AI, not only to better understand and counter the nefarious implications it may have on all components of the ecosystem, but also to help us envision a world in which the art ecosystem can play an active role in shaping the very future of the technology itself. While it is a quasi-impossible

task to identify all components of the art ecosystem given its constant state of flux, the endeavor here is to classify the complex nature of this ecosystem into a set of simplified components to demonstrate the pervasiveness of AI and its impact on the entire ecosystem. The following overview of the art ecosystem is by no means comprehensive. However, it provides some insight into the multifaceted, overlapping, and diverse spaces, products, processes, and agents that are involved with the creation, conservation, and consumption of art.

(1) The Processes are the actions undertaken, decisions made, and paths followed by its agents. These paths can involve tools, skills, and efforts, to name a few, and can be broken down into distinct sub-categories.

1. Creation refers to the set of actions or processes enacted through approaches, practices, techniques, and methods to create art. This process can involve tools and skill sets, such as paint brushes, photo, sound, and video editing software, 3D modeling, and printing software, and hardware. Artists can now use VR glasses to create virtual artworks. AIs that generate images, videos, or 3D models fall into this category. Several artists have already partnered with software engineers to develop and employ AI as a creation tool, generating, for example, classical music that is indistinguishable from that composed solely by a human (Kaleagasi 2020).

2. Consumption refers to the ways in which the audience engages with the work of art and vice versa. AI also has the potential to create new opportunities for interactivity and audience participation (i.e., consumption) that extend well beyond those of performance and relational art (Edmonds and Boden 2019; Edmonds 2010; Popper 2007). For example, facilitating the viewing of, providing context to, interacting with, or at times, disrupting an exhibition altogether (augmented reality applications), answering art history questions, proposing shows (search engines), or analyzing artwork and debating the artistic value of an artistic movement (conversational chatbots).

3. Gatekeeping encompasses the overall set of tasks and activities that are undertaken through institutions inside the ecosystem. AI technology is becoming increasingly prominent in this process, for example, identifying student plagiarism (schools), making a triage of candidates based on resumes, proposals, and phone/video interviews (funding agencies), digitizing, categorizing, and storing artworks (museums), or estimating current and predict-

ing the future market value of an artwork (Secondary marketplaces).

(2) The Gates refer to the physical, virtual, and conceptual spaces and institutions that govern and sustain the parameters of the ecosystem itself. Examples of 'gates' include educational institutions, media platforms, and funding bodies, which define, frame, organize, mobilize, and standardize the ecosystem's parts. Although it may be hard to imagine an entire institution fully structured and maintained with our current state of AI, we could still consider computational hardware and software as gates. For example, laptops, smartphones, or XR glasses could be considered as physical gates, while web browsers, search engines, social media apps, or metaverses could account for virtual gates.

(3) The work of art or the artwork is the physical, conceptual, or virtual body that is produced, selected, or curated by artists through the process of creation. Traditionally, artwork referred to static objects, such as paintings or sculptures, but the notion of interactivity has arisen through kinetic, performance, relational, and digital art. There is also the possibility of AI as the artwork (i.e., product) itself, which is definitely achievable with our current state of technology. For example, a chatbot specifically built by an artist generates interactive content by crawling into the audiences' social media or the web in general. This possibility, however, is distinct from that of AI as the artist (i.e., creator), something that is only imaginable in a plausible future whereby we move from AI to AGI.

(4) The Agents are those within the ecosystem positioned at either end of the production- consumption spectrum, as well as those who engage in gatekeeping. Artists are the agents who choose and undertake to make, create, produce, perform, or author a work of art. Relative to the artist, audiences are agents who view, consume, appreciate, or buy a work of art. Traditionally, they undertake the process of its consumption and could include patrons, spectators, gamers, and others. In the case of interactive art, the blurred boundaries between creation and consumption can result in overlapping agentive roles. Gatekeepers are agents who work for or on behalf of institutions or spaces ('gates') to ensure that the system is sustained and capable of reproducing itself. These are teachers, curators, art historians, critics, market professionals, institutional funders, and others. Traditionally, artists, audiences, and gatekeepers are (human) beings believed to possess self-awareness, agency, reasoning, and creativity. Agents can embody one or multiple agentive roles simultaneously or relative to a particular time or space.

I choose to use the term agents, as opposed to humans or individuals, in an attempt to allow for the eventual plausibility of the machine embodying any of these agentive roles. Although it may be more palatable for some to imagine AGI serving an administrative role within an art organization, there may be more resistance to the idea of a non-human artist engaging in the creation process. It is feasible that this resistance stems from the centrality of creativity in Western cosmologies viewing creativity as an exclusively human quality, despite emerging evidence of creative practices within the animal kingdom.

5 Decolonizing AI and the art ecosystem

Neither AI nor the art ecosystem exists in a vacuum, meaning they are beholden to the same power dynamics that shape our social world. Once we acknowledge the presence of those power dynamics, it becomes necessary to think about access, fairness, and equity in the context of AI and art. How might we decolonize AI+art? What is the process in this space and beyond, and what might be gained from decentering traditionally privileged epistemologies, ontologies, and cosmologies? Moreover, how can art and art making support the decolonization of AI more broadly?

The good news is that we are not completely without a compass to navigate AI's social and technological complexities. Art and art making provide an opportunity to address questions of access and equity by examining AI's heterotopian promise through the lens of arts-based research, critical race, and gender theory. To better understand our current (and future) socio-technological trajectories, we can draw upon decolonization as a central theoretical framework to reimagine and claim our unique positionalities in shaping AI's present and future.

By inviting critical reflection on complex questions about the nature of intelligence, AI, and to a greater extent, AGI invites us to think about the decolonization of these technologies to challenge, negotiate and reimagine power (Ngũgĩ 1986). Although this process will likely be rewarding, a journey toward decolonization will likely be arduous, long, exhausting, painful, and often minacious. As Mignolo (2011) points out, decolonization requires both 'thinking and doing,' which is why artists are uniquely placed to engage in this space. All aspects of our lives—from seemingly innocuous leisure activities to vital decisions about our future— increasingly depend on the algorithms that give agency to AI. As agents of the art ecosystem, it is critical that we grapple with the problems of social injustice and inequity that are shot through these technologies.

As one way of giving shape to the journey of decolonizing AI through art, I propose four interrelated tasks to be undertaken: (i) identifying access as power, (ii) understanding

bias and debunking the myth of objectivity, (iii) gauging the impact of AI and AGI on disenfranchised communities, and (iv) undoing through unthinking and thinking through doing. Each of these tasks can be approached from within the art ecosystem, while AI's impact on the ecosystem provides a way of thinking about and engaging with the issues they represent.

5.1 Identifying access as power

To begin the process of decolonization, I pose a simple question: Who has access to AI technology? How do these people benefit from AI's current and promised materialization? It has been demonstrated that technology, through its process of production, already incorporates subjective values that cater to "the interests and vision of specific actors, sometimes at the expense of other actors with less power" (Feenberg and Beira 2018; Wachter-Boettcher 2017; Baeza-Yates 2018). Given that racial and economic divides often share the same boundaries, access to AI remains problematically in the hands of a privileged few.

As an example of how access to AI intersects with the art ecosystem, I have to look no further than my own work as an artist and art-based creative researcher. To create art and pursue my research, I rely on programmers with graduate degrees. Access to this knowledge is a privilege maintained by a select group who can reap huge benefits (one estimate puts AI specialists' salaries upwards of 500,000 USD (Watney 2019)). The type of processing power and equipment needed to enact AI is also very expensive. Individual augmented reality glasses, for example, are increasingly used to create and consume AI- based art but can cost thousands of dollars. These barriers create access issues for small groups and individuals without access to significant funding (Baradaran and Brielmaier 2019).

As a result of the barriers to access, very few practitioners working outside of major corporations have been able to engage with the rich, transformative possibilities offered by AI. While I am aware of artists unattached to corporations who can code and have produced their own AI-based art, the majority of access to high-quality, industry-leading AI remains limited to technology communities. As a widespread commentary on the homogeneity of engineering and technology demographics testifies, lack of access is especially concerning for women and people of color, who, at least in part because of prejudice and discrimination broadly, face numerous barriers to entering fields of science and engineering (Leggon 2010; Charleston, Lang, et al. 2014; Bystydzienski and Bird 2006).

The demographic homogeneity of technology communities has worked to incentivize a culture of heteronormative masculinity within, which is glorified through ruthless competition and the normalization of corporate greed. To understand the homogeneity of largely cisgender heterosexual White male realities, we must see how the tech industry emerged from the geographically imbued neoliberalism of California's Bay Area. As demonstrated by slogans like "We are disrupting the old economy" and "We are changing the world," the industry is shaped by a discourse of technological determinism carried through American capitalism and residuals of the White savior complex. Insinuated by these slogans is the idea that the change will follow a positive and upward trajectory towards a "better world" without specifying for whom the world will be better or the "we" involved in its creation. Artists and other critical thinkers must ask who benefits (and does not) from technological promises of disruption and change.

The rapid growth of AI has generated considerable wealth and power for its initial creators, resulting in a quasi-oligopolistic market. Despite the multiple 'winters' it has faced, the AI industry has secured its ascension by yielding impressive economic power and political clout for its creators, which has mainly not included artists or agents of the art ecosystem. Given its relatively recent materialization and our inability to fully grasp its current capabilities (not to mention the future capabilities of AGI), the AI industry has mainly been able to dodge meaningful government regulation. This lack of regulation and the significant resources required have limited AI access in a way that excludes small and individual players. How are artists meant to engage with and critique AI's transformative potential if they are unable to access and 'play' with these technologies?

5.2 Understanding the notion of bias by debunking the dominant discourse of objectivity

There is a fallacious idea that the mathematical algorithms of which AI is composed are anything like "neutral" or "objective" (O'Neil 2016; Broussard 2018; Eubanks 2015). As discussed, human agents are still very present in developing and deploying AI technologies, and this either explicitly or implicitly introduces biases. O'Neil (2016) conceived of the algorithms that comprise AI technology as "weapons of math destruction," algorithmic models that encode "human prejudice, misunderstanding, and bias into the software systems that increasingly manage our lives" (2016). Encoded bias can have extraordinarily destructive effects, particularly as algorithms are used as critical decision makers governing everyday opportunities for education, credit, employment, and social services (O'Neil 2016; Eubanks 2015). As is the case throughout society beyond the digital, the brunt of these destructive effects is uneven, falling upon people of color, immigrants, the poor--those, in short, who are already vulnerable. Algorithms used in popular search engines, such as Google (or conversational chatbots, such as

ChatGPT), generate similar but distinct deleterious effects (Noble 2018). Trafficking in what is most popular, rather than what is true, search engines normalize popular misconceptions until they seem, in turn, to be understood as truths. Rather than help to bridge social divides, search engines and digital media--platforms of companies seeking profit, and even some non-profits like Wikipedia--have thus instead exacerbated social and racial inequalities across the globe, perpetuating racist and sexist stereotypes. We must contend with this reality as part of the decolonization process, pausing to identify and critique the inherent biases in any human engineering product.

Bias is not always, of course, the result of some sort of irrationality, nefariousness, or false privilege. To explain this further, while undertaking an artistic residency at UC Berkeley in 2012, I began to play with the idea of computational code as 'po{AI}try' and software engineers as its 'po{AI}ts.' This concept provides a way to challenge the alleged objectivity of machine language, and the role engineers play in its authorship. From an aesthetic and formal perspective, code is a modern form of poetry and, like poetry, po{AI}try a form of textual knowledge production; we must focus our attention on its creators rather than ignoring their central role. Code, therefore, can provide insight into the worldviews, social experiences, and value systems that are imparted, largely unwittingly, by its po{AI}ts (Baradaran and Brielmaier 2019).

In a 2017 interview with the Tang Museum, I explored the inherent biases in coding by unpacking some of the assumptions baked into the mobile application PokemonGO (Brielmaier 2018). Shortly after its launch, this game became one of the most downloaded applications in the world, using augmented reality (a subcategory of computer-vision and AI) to allow users to 'catch' cartoon creatures throughout the real world. For me, this application illuminated and reinforced inequities of access well beyond the technology itself. Bracketing the many instances of users walking into walls and other well-publicized adverse events (Tsukayama 2020), this cultural phenomenon gave me pause. As a person of color and an immigrant, I do not have the same mobility as others. There are places I am simply not safe to go— and thus, even before downloading the application, I was at a disadvantage when it came to collecting the augmented creatures. To be clear, I do not believe my disadvantage was the malicious work of engineers attempting to reinscribe power asymmetries in their gaming platform. Instead, it is far more likely that the people who designed the application and wrote the code were unaware of how race, gender, and class can inflect mobility because they most likely had never experienced these factors as barriers in their own life. While this shallow dive into questions of bias might seem to problematize an inconsequential leisure activity unfairly,

it is a useful example of larger and concerning trends in our algorithm-saturated society.

The same power dynamics illuminated through an application like PokemonGO are also salient regarding AI in art. There are already numerous examples of AI being employed as a tool in the art creation processes, and it is critical that we think through how this use might recreate and reinforce prejudice and bias. One clear example of bias can be found in algorithmic-based auto-correction in digital photography, which almost uniformly privileges lighting and development to enhance pale skin tones at the expense of those with black or brown skin (Lewis 2020; Tell Me More Staff 2020). An artist using this technology may have to take special steps to correct this racial bias or, even more problematically, may be unaware of it altogether. Similarly, works of art involving augmented reality are limited by the racial and gender biases of AI-driven facial recognition and tracking software, many of which have been trained using datasets dominated by images of White cisgender men (Beras 2020).

Without access to AI technologies, it can be difficult to understand the places in which they have been inserted into the art ecosystem and the ways in which they operate. Thus, the challenges of identifying bias and critiquing objectivity are compounded by a lack of access. To decolonize the biases and prejudices of digital photography and other artistic media, artists must be aware of and engaged with their limitations, not leaving it to software engineers who may not be asking important questions about fairness and equity.

5.3 Gauging the pervasive impact of AI on disenfranchised communities

Thus far in this section, I have explored AI's challenges to fairness and equity, including in art and art making. To fully appreciate the scope of these challenges, however, it is necessary to contend with the capacity of AI itself and the exponentially greater capacity imagined for AGI. Indeed, AI technologies' sheer scale, speed, and scope can exacerbate the recursive relationship between access and bias. This can have destructive effects when AI becomes involved in decision making. As the example of AI making a 'decision' about color correction in digital photography reveals, there are places within the art ecosystem where biases inherent in AI disempower some groups while empowering others. Is it a coincidence that this power distribution reflects broader social systems of inequity?

Beyond art, opportunities pertaining to education, credit, employment, and social services are already governed to some extent by AI-driven decision making (O'Neil 2016; Eubanks 2015). As is the case in other facets of life, the brunt of these destructive forces falls mainly upon groups already disenfranchised, namely people of color, immigrants, women, and the poor (O'Neil 2016; Eubanks 2015).

Building on my second task around identifying bias, it is also necessary to consider who is affected by those biases and what effects are wrought. Others have already started exploring these considerations in society broadly. For example, in studying the technological networks for providing social services to the poor, Virginia Eubanks firmly argued that: "technologies of poverty management are not neutral. They are shaped by our nation's fear of economic insecurity and hatred of the poor; they, in turn, shape the politics and experience of poverty" (2015). Automated decision making, therefore, not only criminalizes the vulnerable and hollows out our social programs, but it threatens to completely subvert democratic values.

The question of who is affected by the biases and prejudices of AI and what those effects might be is also highly relevant to the art ecosystem. What are ways, for example, in which AI inflected with prejudice might shape knowledge creation and dissemination tools? Who is disempowered through this process, and what perspectives are marginalized? Similarly, we might imagine AI being used as a tool of human gatekeepers to make decisions about awards, funding distribution, and other activities within the art ecosystem, and with AGI, imagining a machine as the gatekeeper is also necessary. Can these technologies be used to create a 'fairer' system, or will they merely recreate existing inequities?

To be clear, dynamics of power already create inequity in the art ecosystem. Still, such inequities threaten to amass exponentially when empowered by AI technologies' scale, speed, and scope. Thinking carefully through how practitioners, educational institutions, funding bodies, and others can work together to make the field more equitable is something we must not just 'consider' but actively pursue. This work is made all the more imperative in the face of technologies that may entirely reshape the art ecosystem. Such a task, however, is increasingly more complicated given the challenges of access I have already described, which are strengthened and reinforced by the rewards of capitalist systems.

5.4 Undoing through unthinking and thinking through doing

For the tasks I have outlined through the previous three points to take hold and be truly revolutionary, we must constantly work to unsettle dominant and taken-for-granted 'truths' about our world. This work is at the heart of decolonizing AI + art to critique existing modes of thinking and create space for other forms of epistemology, ontology, and cosmology. These may include those previously rendered invisible by the colonial project and those that have yet to be imagined. Regardless, it is only possible to come up with meaningful solutions to the challenges posed by AI if we take a big-picture view of how power privileges modes of

thinking, which is itself a rather creative and potentially transformative process.

'Undoing through unthinking' is largely about interrupting the dynamics of power that shape our world and dominate how we think. As I outlined previously concerning intelligence, so much of contemporary discourse remains stubbornly anthropocentric. Consider how we think about agents in the art ecosystem, which we primarily imagine as human actors. Where our collective imagination allows us to wander usually goes only so far as to contemplate AI as the artist, even though AGI could conceivably serve as the artist, audience, curator, and funder. The possibility of humans being removed entirely from the art ecosystem demands decolonized ways of conceptualizing intelligence and creativity to more expansively encompass other ontologies in ways that no longer favor humans as the sole masters of consciousness.

Fortunately, there is already a large body of work on posthumanism and transhumanism in imagining a non-human art ecosystem. Notably the writings of theorists like Deleuze (1992) and Hardt and Negri (2000). This work has produced rich analyses of our current moment and potential future. However, from both theoretical and practical perspectives, we must be cautious. Rosi Braidotti (2017) stresses the importance of creativity in pursuing "new figurations or navigation tools" to create fresh assemblages, events of intensity or affect lines of flight, or new paths of becoming. At the same time, we must remain critical of our concrete or actual conditions, issues of access and agency, networks of power-knowledge, and technologies that (re-)produce material inequalities in everyday lives (see also Massoumi 1995). From a conceptual vantage, as the "posthuman" takes shape as a means to displace the philosophical primacy of human consciousness—to reintegrate the human within distributed systems both organic (Bennett 2010) and mechanic/digital— we run the risk of simply displacing one immaterial concept of subjectivity (consciousness) with another (information networks), and in so doing erase the question of the body (Hayles 1999; Halberstam and Livingston 1995). Doing so, however, would side-step issues that embodiment explicitly confronts us with—issues of sexuality, race, ethnicity, and gender--that we cannot, and should not, ignore. This is not just a metaphor, but a material process that requires us to think critically and strategically. There are urgent practical, cultural, political, and philosophical questions at stake with the rise of AI, and we convened so as to think critically through them, and create possibilities from them.

It must be noted that efforts have been made to address issues of toxic masculinity, whiteness, technological determinism, and lack of diversity within cultures of technology. These efforts, however, have been primarily driven by those from within technological communities and have tended to favor the 'details' of inequity and injustice without necessarily

addressing the structural forces by which they are sustained. The disconnect between these two types of macro and micro analysis reflects the siloing of higher education, which creates a critical distance between artists, theorists, and social scientists on one side and software developers and engineers on the other. This distance has ultimately prevented both sides from affecting meaningful change, even if their goals are aligned. Suppose there is to be any hope of addressing the limitations and realizing the potential of AI. In that case, we must consider how the education of artists and engineers must be decolonized to allow ideas and expertise to move more freely between fields of knowledge.

The salient point to be made through this discussion is that while it is important to think about questions of access, bias, and marginalization, the very ways we think about these questions must be challenged and changed. As it exists now, AI was created within systems that profit from inequity and injustice; to fully undo this, we must imagine a new kind of system and maybe a new kind of art ecosystem. Especially considering the advent of AGI, if we do not start by unthinking to reshape our concepts of self, others, and the world, we will merely recreate the same dynamics of colonialism and capitalism that have concentrated wealth and power around AI in a select few. These are the same systems of power that have baked social biases and prejudices into the technologies that shape our lives, such as excluding artists and other critical thinkers from engaging with AI technologies and birthing a generation of engineer po{AI}ts who may desire to 'do good' but are limited by unfamiliarity with different ways of thinking. All of this is directly relevant to art and art making, as these challenges will remain unchecked if agents of the art ecosystem do not step up and demand the opportunity for engagement.

Without sounding too pessimistic, the decolonization of AI + art is likely to be painful and is possibly doomed to fail. AI is already a salient part of our lives and increasingly of the art ecosystem; it may be too late to start this important work. Undoing the system, we inherited is no less plausible than achieving AGI, and these two formidable goals may support each other through the generative and prodigious processes they require. Indeed, what is the purpose of art and art making if not to seek out the divine, transformative, and improbable beauty of creativity? By rooting the journey of decolonization in goals of equity and justice, the art ecosystem can profoundly impact the future of AI and its place in our societies. Decolonization begins now.

6 Radical imagination in other cosmologies

Assuming that a significant portion of the AI research conducted globally is set to achieve AGI with the human-like qualities of consciousness, agency, and creativity, we should use this significant opportunity to interrogate our own assumptions and biases in defining the parameters of the art ecosystem. The art ecosystem is uniquely entangled with the core questions facing AGI, which positions agents of the art ecosystem in the center of the race toward a thinking machine. Thus, we must acknowledge our professional and moral responsibility to engage with AI while simultaneously exercising critical vigilance in shaping the course of its development.

As I write this, AI is already being used by giant technology companies to craft detailed narratives about each one of us—stories about our habits, likes and dislikes, networks, and more—that are used to make decisions that affect our lives. Alas, these stories serve commercial interests almost exclusively, are mostly unregulated by law or policy, and often exist without our knowledge or permission. As an artist and a queer person of color, I am especially attuned to AI's fallacies, having spent considerable time contemplating and pursuing ways of restoring people's agency to tell their own (digital) stories. This agency is essential for challenging the reproduction of inequity through AI, and it offers a uniquely speculative space for examining our very sense of the self.

This inspection will foster philosophical and ethical questions that are aware of but not constrained by the nature of AI. Some of these questions may be uncomfortable: Are Western ontologies useful, sufficient, or even necessary to examine the nature of AI? Do we need to seek guidance from other—and often othered—cosmologies that live outside the temporal, spatial, and bodily sites of knowledge through which AI and art are conceived and produced? If so, how? This exploration may be the perfect opportunity for rethinking anthropocentrism and allowing for the emergence of bodies (of knowledge) that stem from or live through the types of cosmologies that have been marginalized or erased by Western ideas of being and ideals of becoming. In this momentous space, perhaps we should foreground the idea of imagining a radical future that may not need to be about AI. But instead, somewhat counterintuitively, about a metanarrative of the self-versus the other that gestures toward a more generative process of be(com)ing.

On the worrying rise of what he calls "societies of control," in which data and algorithms bring a new era of domination, Gilles Deleuze once commented: "There is no need to fear or hope, but only to look for new weapons." That is our call to action. However, alternatively, of looking for new weapons, as creatives, innovators, and thinkers interested in this special issue, we must begin to create tools. I welcome all of you to join us on this journey and build a radically better future together.

7 Summary of the selected chapters

7.1 Chapter 1: mapping AI's impact on the overall art ecosystem decolonizing artificial intelligence {AI} & the future of art making

7.1.1 AnotherAI.art summit: decolonwhite paper—by Amir Baradaran

An[0]ther {AI} in Art Summit (New Museum 2019) for the first time brought together eighty artists, scholars, curators, technologists, community leaders, institutional influencers, and decision makers to address gaps, challenges, and opportunities at the intersection of critical inquiry, art making, and artificial intelligence. This white paper provides an overview of the summit along with a synthesis of all discussions that took place during its three days of programming. How has AI shifted the art ecosystem, and how can we, as thoughtful agents, help shape this transformation in the name of equity and access? Founded by Amir Baradaran, the summit was co-hosted by the Knight Foundation, Columbia University School of Engineering, New Museum, and NEW INC.

7.2 Chapter 2: understanding the notion of bias by debunking the dominant discourse of objectivity

7.2.1 Art histories from nowhere: on the coloniality of experiments in art and artificial intelligence—by Mashinka Firunts Hakopian

This paper explores recent experiments in art and AI that train algorithms using Western art historical datasets. It highlights a rejection of canonicity in art history while algorithmic practices in the US and Europe reinforce the Western canon. Operating under a "view from nowhere," generative art inherits colonial biases, conflating visual art with Western cultural production and entrenching aesthetic values associated with the white male artist-genius. The essay addresses the need to be aware of the lens through which AI systems perceive, examining the coloniality of these experiments and proposing alternative visions by integrating data feminisms and decolonial studies.

7.3 Chapter 3: gauging the pervasive impact of AI on disenfranchised communities sculpting the social algorithm for radical futurity—by Anisa Matthews

Social media has transformed information dissemination, but algorithms influenced by capitalism shape the content each user sees. Researchers have explored biases in these algorithms, particularly regarding marginalized communities. Drawing on Marisa Elena Duarte's Network Sovereignty, this paper examines how social media platforms distribute information, silencing Black, brown, and indigenous voices. It explores how communities of color can leverage algorithmic knowledge to engage in effective socio-political discourse, transforming social networks into platforms for radical change.

7.4 Chapter 4: undoing through unthinking and thinking through doing: mind extended: relational, spatial, and performative ontologies—by Maurice Jones

The extended mind theory suggests that our minds extend beyond our bodies and into the material world. This paper redefines the concept by examining the artistic performance of the android Alter, inspired by the Kagura ritual, to explore intersubjective encounters between humans and non-humans. It combines indigenous scholarship, feminist STS, and performance studies to challenge conventional notions of affect, perception, and relationality. The paper investigates how intersubjective relationality unfolds in performance space and proposes a new event score that embraces a reconceptualized theory of the extended mind for fostering alternative forms of intersubjective relationships.

7.5 Qatipana: cybernetics and cosmotechnics in Latin American art ecosystems—by Renzo Filinich Orozco

In this essay, we examine the artwork Qatipana in relation to Gilbert Simondon's information processing system approach. Qatipana, a hybrid ecosystem of information flow, provides empirical insights to test Simondon's ideas on Becoming and Individuation within an algorithmic cycle performed by an AI agent. We explore how the computerization of cultural techniques affects understanding relationships with others. We contrast Simondon's insights with the work of Wiener, Beer, and Chinese philosopher Yuk Hui. This symbiotic intersection of technology and art presents challenges and complexities, highlighting the need for thoughtful engagement in the face of computational systems' pervasive presence. Latin America and beyond require insightful and imaginative approaches in this context.

7.6 Technology, the latent conqueror: an experimental study on the perception and awareness of technological determinism featuring select sci-fi films and AI literature—by Ardra P Kumar

The main discussion of this paper is exploring the relationship between society and technology, particularly focusing on artificial intelligence, through analyzing films such as Ra One, Android Kunjappan, and Ironman 3. Additionally, an experimental study investigates the perception of engineering students regarding technology's role in creating utopian and dystopian worlds. The paper aims to raise awareness of technology's limitations, foster harmony between society and technology, and prepare students to perceive technology consciously and build a utopian world.

7.7 Chapter 5: envisioning radically equitable and speculative futures reimagining benin bronzes using generative adversarial networks—by Minne Atairu

This paper introduces the artistic project Igùn, which utilizes StyleGAN models to explore the hypothetical production of bronze objects in the Benin Kingdom if the 1897 British invasion had not occurred. The invasion led to the looting of over 3000 artworks and a perceived artistic decline from 1897 to 1914. Due to the lack of visual documentation from that period, Igùn proposes a series of StyleGAN models trained on a dataset of looted Benin Bronzes. The project is inspired by the artistic protocols of the Igún Eronmwon (royal guild of bronze casters) and presents three prototypes that explore themes such as infancy and facial expressions, which were underexplored in Benin's classical bronze casting tradition.

7.8 Artificial reproduction? Tabita Rezaire's sugar walls teardom and AI "liveness"—by Sara Morais Dos Santos Bruss

Recent research has aimed to historicize the divisions between human and non-human attributes and skills, exposing their connections to colonialism. Atanasoski and Vora (2019) describe this as "surrogate humanity," where narratives of autonomous technologies erase formerly colonized people involved in their production. The maternal figure in this context reveals gendered and racialized roots, shedding light on the invisible labor of marginalized bodies in AI production. These genealogies challenge the detachment implied by the surrogate figure and emphasize a more generative relationship between the black maternal figure and AI. The analysis of Tabita Rezaire's artwork "Sugar Walls Teardom" explores decolonial and queer interpretations of black female bodies within technological imaginaries, aiming to move beyond AI surrogacy towards notions of kinship, care, and alternative forms of existence.

7.9 The goddess and her icon: body and mind in the era of artificial intelligence—by George Zarkadakis

As the pagan classical world transitioned to Christianity, sexually active deities transformed into saints, and their statues were destroyed and replaced with austere icons. This dualistic narrative, emphasizing the separation of soul and body, persists in the distinction between software and hardware, algorithms and robots. In the 21st century, as we approach coexistence, unity, or merging with intelligent artifacts, this narrative raises questions about the blurring of "humanness." As humans augment their capabilities through genetic engineering, drugs, and technological prostheses, we contemplate whether we will reshape ourselves in the image of ancient gods through the physical embodiment of technology or complete disembodiment within virtual worlds.

Data availability The authors declare that [the/all other] data supporting the findings of this study are available within the article.

Declarations

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

References

Another AI in Art (2019) '2019 Another AI in Art Summit Catalog'. Retrieved from https://www.anotherai.art/about

Baeza-Yates R (2018) Bias in web data and use taints the algorithms behind web-based applications, delivering equally biased results. Commun ACM 61(6):54–61

Baradaran A, Brielmaier I (2019) Augmenting empathy and decolonizing AR/VR mediums: how do we reimagine augmented and virtual reality experiences? In: Gokcigdem E (ed) Designing for

empathy: perspectives on the museum experience. Rowman & Littlefield

Bennett J (2010) Vibrant matter: a political ecology of things. Duke University Press, Durham

Beras E (2020) When AI misclassified her face, she started a movement for accountability. Retrieved from https://www.technologyreview.com/lists/innovators-under-35/2018/pioneer/joy-buolamwini/

Braidotti R (2017) Posthuman critical theory. J Posthuman Stud 1(1):9–25

Brielmaier I (ed) (2018) Accelerator series: technology, visual culture, and politics of representation. Skidmore College, The Francis Young Tang Teaching Museum and Art Gallery, Saratoga Springs, New York

Broussard M (2018) Artificial intelligence: how computers misunderstand the world. MIT Press, Cambridge, MA

Deleuze G (1992) Postscript on the societies of control. October 59:3–7

Edmonds E (2010) The art of interaction. Digit Creativity 21(4):257–264

Eubanks V (2015) Automating inequality: how high-tech tools profile, police, and punish the poor. St. Martin's Press, New York

Feenberg A, Beira E (eds) (2018) Technology, modernity, and democracy. Rowman & Littlefield, New York

Halberstam J, Livingston I (eds) (1995) Posthuman bodies. Indiana University Press, Bloomington, IN

Hardt M, Negri A (2000) Empire. Harvard University Press, Cambridge, MA

Hayles NK (1999) How we became posthuman: virtual bodies in cybernetics, literature, and informatics. University of Chicago Press, Chicago

Kaleagasi B (2020) A new AI can write music as well as a human composer: the future of art hangs in the balance. Retrieved from https://futurism.com/a-new-ai-can-write-music-as-well-as-a-human-composer

Lewis S (2020) Racial bias in photography. Retrieved from https://www.nytimes.com/2019/04/25/lens/sarah-lewis-racial-bias-photography.html

Massumi B (1995) The autonomy of affect. Cult Crit 31:83–109. https://doi.org/10.2307/1354446

Mignolo W (2011) The darker side of Western modernity: global futures, decolonial options. Duke University Press, Durham

Noble S (2018) Algorithms of oppression: how search engines reinforce racism. NYU Press, New York

O'Neil C (2016) Weapons of math destruction: how big data increases inequality and threatens democracy. Broadway Books, New York

Popper F (2007) From technological to virtual art. The MIT Press, Cambridge, MA

Russell S, Norvig P (2003) Artificial intelligence: a modern approach, 2nd edn. Prentice Hall, Upper Saddle River, New Jersey (**ISBN 0-13-790395-2**)

Tell Me More Staff (2020) Light and dark, the racial biases that remain in photography. Retrieved from https://www.npr.org/sections/codeswitch/2014/04/16/303721251/light-and-dark-the-racial-biases-that-remain-in-photography

Tsukayama H (2020) Retrieved from https://www.washingtonpost.com/news/the-switch/wp/2016/07/08/pokemon-gos-unexpected-side-effect-injuries/

Ngũgĩ wa Thiong'o (1986) Decolonising the mind: the politics of language in African literature. J. Currey, London

Wachter-Boettcher S (2017) Technically wrong: sexist apps, biased algorithms, and other threats of toxic tech. W.W. Norton & Company, New York

Watney C (2019) A framework for increasing competition and diffusion in artificial intelligence. Retrieved from https://www.rstreet.org/2019/03/21/a-framework-for-increasing-competition-and-diffusion-in-artificial-intelligence/

Zakardakis G (2015) In our own image: Savior or destroyer? The history and future of artificial intelligence. Pegasus Book, New York