

# Decentering Design With AI

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The growing planetary impact of Artificial Intelligence (AI) systems reveals new social and environmental dilemmas, highlighting the entanglement of humans and non-humans. Viewing them as socio-technical systems reveals their impact as more than just products, pervasively distributed across space and time. To manage them sustainably, we need to look beyond the product-service to the temporalities, agencies, and scales of assemblages mobilised by AI. This issue explores perspectives such as data justice, posthumanism, and decolonization to critically rethink design in relation to AI across disciplinary boundaries, explaining the need for alternative perspectives on the challenges posed by technologies. Together, they emphasise the philosophical decentering of AI as an essential strategy that design should embrace to responsibly shape innovation. The article proposes a new decentralised approach for design to strategically position itself in the global public debate on AI systems.

**Keywords**

Decentering design

Artificial intelligence

More-than-human

Human-computer interaction

Responsible innovation

The first use of the term “artificial intelligence” and the birth of the related field of research is commonly attributed to a workshop held at Dartmouth College (US) in the summer of 1956, although the elaboration of important concepts and the seminal work of researchers such as Alan Turing had been going on for decades. See “Timeline of artificial intelligence” on Wikipedia (2023).

Almost 30 years ago, Nigel Cross (2001) asked whether a machine could design, using the question as a research strategy to better understand design and designers. Today, as we continue to ask the same question—with a tendency toward an increasingly polarised range of answers, infused with distinctions about the meaning of design itself—it becomes important to shift the focus to the how, because it is a question that no longer affects only design or computer science circles, but society as a whole. AI systems are expanding their impact on a global scale, bringing to light new social and environmental challenges and revealing the entanglement of humans and non-humans within these platforms (Spelda & Stritecky, 2020). Considered as socio-technical systems, their impact goes far beyond the perceived, as they are ubiquitous in space and time. Managing them sustainably and deciding how to use, limit, or even abandon them requires a vision that goes beyond products and services to include the agentivities, temporalities, and scales of the assemblages mobilised by AI. In this issue of *diid*, the Open Debate section proposes a map of this challenge, offering perspectives that push critical thinking beyond disciplinary fences and declaring the need to multiply the vantage points of the problems that technologies pose to us.

### The Debate Around AI

The current debate about AI has been complex and multifaceted since its inception<sup>1</sup>. It touches all levels of human knowledge, from philosophical implications to technical and normative ones. It is a story of polarising dichotomies, ontological questions (Floridi, 2014), approaches that look at things as if they were meant to be studied in isolation from the systems with which they are intertwined, and struggles caused by the attempt to distinguish conceptual layers, as in the case of culture from biology (Caronia, 2020). The attempt to build intelligent machines is undoubtedly the human epic that, more than others, has subjected us to a continuous alternation of seasons of enthusiasm and disappointment, revealing a level of difficulty that always exceeds expectations (Mitchell, 2021). A history, however, in which the space of meaning of things has been severely compressed, squeezed on the one hand by paradigmatic theories and on the other by the development of their applications, a space needed to measure meanings, implications and ideas of the futures we want.

Excluding from our discussion the innovation and development of applications in the innumerable vertical fields and domains, from chemistry to molecular biology, from robotics to linguistics, and coinciding with a sudden phase of popularity due to the public availability of language model-based applications, we are interested in highlighting how research is increasingly focused on the design of responsible AI systems (Lu et al., 2023). It seeks to explore the risks associated with advanced systems, with a particular interest in developing approaches to their trustworthiness that go beyond the logic of transparency (Ananny & Crawford, 2018) to the explainability of algorithms (Naiseh et al., 2021), increasingly fundamental

requirements for trust in these (Liao & Varshney, 2021) systems, in an attempt to rebalance the logics of power and injustice inherent and reverberating in (Birhane, 2021) technological structures. We are arguably at the beginning of a new design culture in search of non-binary and pluriversal epistemologies (Escobar, 2018), to decolonize (Tunstall, 2020), and to question the implications of technological supply chains beyond the immediacy of interaction.

### **Some AI Challenges for Designers**

If the impact of AI systems is disrupting society, design as a supply chain of activities, methodologies, and mindsets is equally disrupted: while there is the promise of new capabilities at our service, there is also emerging pressure to reposition skill sets, posed by the systemic nature of these technological platforms, and the new responsibilities this entails. New technical paradigms — which designers seem to be struggling to understand (Yang et al., 2020) — are also pushing our disciplinary field to discuss essential and foundational concepts such as creativity and a sense of the designer's role.

The emergence of neural network-based systems, such as AlphaGo (which gained notoriety for its performance in the complex board game Go), offers an intriguing perspective on creativity, even if it operates in ways that are not immediately recognizable to humans (Halina, 2021). This challenges our conventional understanding of “digital creativity” (Lee & Chen, 2015) and forces us to re-evaluate established concepts. In the realm of AI-based systems, the notion of creativity, previously studied from a computational point of view (Bown, 2012), takes on new dimensions, and the role of the designer expands beyond traditional boundaries. Addressing these issues requires more than just multidisciplinary approaches; it requires embracing generative viewpoints and exploring the intricate connections within socio-technical systems. The study of creativity and the role of the designer becomes a rhizomatic exploration that delves into the complex interplay of multiple factors.

Since, in the words of Yang et al. (2020), what makes AI powerful for designers is also what makes it difficult to manage, we are also likely to be confronted with the need to rethink our skill system. For example, designers risk failing to prototype and iterate with AI using existing tools and methods because its behaviour is difficult to predict accurately. Indeed, Yang et al. (2020) point to uncertainty in determining its actual capabilities and the complexity of outcomes as the main categories of barriers that AI poses for designers. At the same time, however, other perspectives encourage the use of sources of uncertainty in machine learning as new capabilities to expose and challenge normative assumptions of these same AI systems (Benjamin et al., 2021).

One challenge designers face with AI is its perceived opacity, as well as the complexity of identifying fruitful approaches within its various technology families. While some public-facing AI applications remain opaque, building responsible technology stacks with AI is feasible (Lu et al., 2023), and worth considering because even in small projects, unintended consequences can quickly escalate to dangerous levels, especially for vulnerable users (Yang et al., 2020). But the

intricacies of AI present challenges that transcend individual skills and disciplinary boundaries. Design, while critical, can't achieve full autonomy in AI management without cross-disciplinary insights. Studies such as Woolley et al. (2010) and Hong & Page (2004) highlight the value of interdisciplinary collaboration in AI system design (Janssen et al., 2020). In addition, deep learning AI integration may adversely affect competent teams and favour lower performing ones (Zhang et al., 2021), prompting reflection on the balance of human and machine capabilities within work teams and processes. Organisational challenges highlight individual limitations on decision-making autonomy (van de Poel, 2001), underscoring systemic AI issues that require comprehensive solutions.

The transformative potential of AI reaches deep into the roles we play, with designers shifting from creators to evaluators of decisions made by or in collaboration with machines. This shift is accentuated by the evolving ontological status of tools as they achieve "intelligence" (Lim & Jung, 2018). The question then arises: are we ready to question our own ontological dimension in this evolving landscape?

### **AI Systems Are Systems, Not Design Materials**

Recent perspectives have positioned AI as an emerging "design material" offering expanded possibilities that designers can harness for its generative capabilities (Dove et al., 2017), and as an expressive medium to experiment with (Holmquist, 2017). Indeed, many artists and designers are already integrating AI into their practice as a process and material, consciously embracing its unpredictability and ambiguity as expressive, and even seeking to challenge existing power dynamics around AI research (Caramiaux & Fdili Alaoui, 2022). As Sangüesa and Guersenzvaig (2019) warn, design with AI is characterised by an evolutionary dimension, the results of which may be unpredictable compared to traditional passive materials. AI exhibits autonomy-in the sense of performing operations that may deviate from instructions-which requires designers to consider it as much more than an application. But while the "design material" view is useful, and some of the recommendations made by several researchers who embrace this concept are relevant, focusing on this perspective risks downplaying the complex real-world implications of AI. Designers should complement this view with a holistic analysis of the political, ethical, and social dimensions of AI systems to enable responsible use of its benefits, while discovering new opportunities for the profession.

AI is commonly perceived as a "soft" entity, but it also has a tangible face, because the materiality of information stems from the fact that its processing and communication depend on physical infrastructure, devices, networks, etc. (Dourish, 2017). Digital information also has a social materiality in terms of the practices, skills, norms, and organisations involved in generating and sharing information. Materiality also derives from the ways in which information acquires meaning in relation to activities, contexts, institutions, history, and culture. Information is given meaning through social practice. This is why a voice assistant device can be represented as a

manifesto of these redundancies, as explained in the Anatomy of an AI System project (Crawford & Joler, 2018), which points out how the design of industrial products injected by AI has dramatically scaled its capacity to produce unwanted, distributed, and largely hidden spillovers (featured in Stories). In this sense, AI systems can become tools for knowledge extraction (Pasquinelli & Joler, 2020), exploitation of workers (Altenried, 2020), and shape new forms of colonisation of already threatened cultures (Whaanga, 2020). All of these factors give AI infrastructures the configuration of complex systems, extended in time and space, capable of displacing heavier consequences and emerging power structures that also affect design processes more than ever (Cattabriga et al., 2022).

Richard Buchanan (2019) uses the example of a classroom to illustrate how different ways of thinking influence the perception of a system: seeing it as an “arrangement” emphasises seating positions, while seeing it as a “condition” emphasises ideals and meanings. This is just to illustrate that if using one metaphor to frame a phenomenon rather than another determines how researchers and practitioners approach problems, we have a responsibility to choose the right ones, or at least not to limit ourselves to one.

Given that there is no designed system in the world that does not encapsulate the autonomy and capacity for choice in the hands of the designer (Floridi, 2017), AI systems are no exception. And it is this space of arbitrariness that design must reclaim, knowing that behind every component of these technology platforms there are choices to be made and consequences to be assessed. Designers have a strategic opportunity to support the development of AI through a multidimensional lens, exploring the meanings of processes and their systemic effects in an interdisciplinary and responsible way, as Kate Crawford suggests in the following pages, by focusing on what they do best, which is to look at the essence of things.

## **Decentering Perspectives on AI**

The Open Debate section of this issue aims to go beyond the tactical and technical uses of AI applications that have been widely discussed elsewhere, and to point to some questions that remain open, challenging, and necessary. The papers and Stories presented here critically analyse the assumptions, biases, and problems inherent in the design of AI-based systems, highlighting contextual, ethical, social, and creative dimensions grounded in research areas that are often considered too divisive, too frontier, too technical, or too minority Fig. 1.

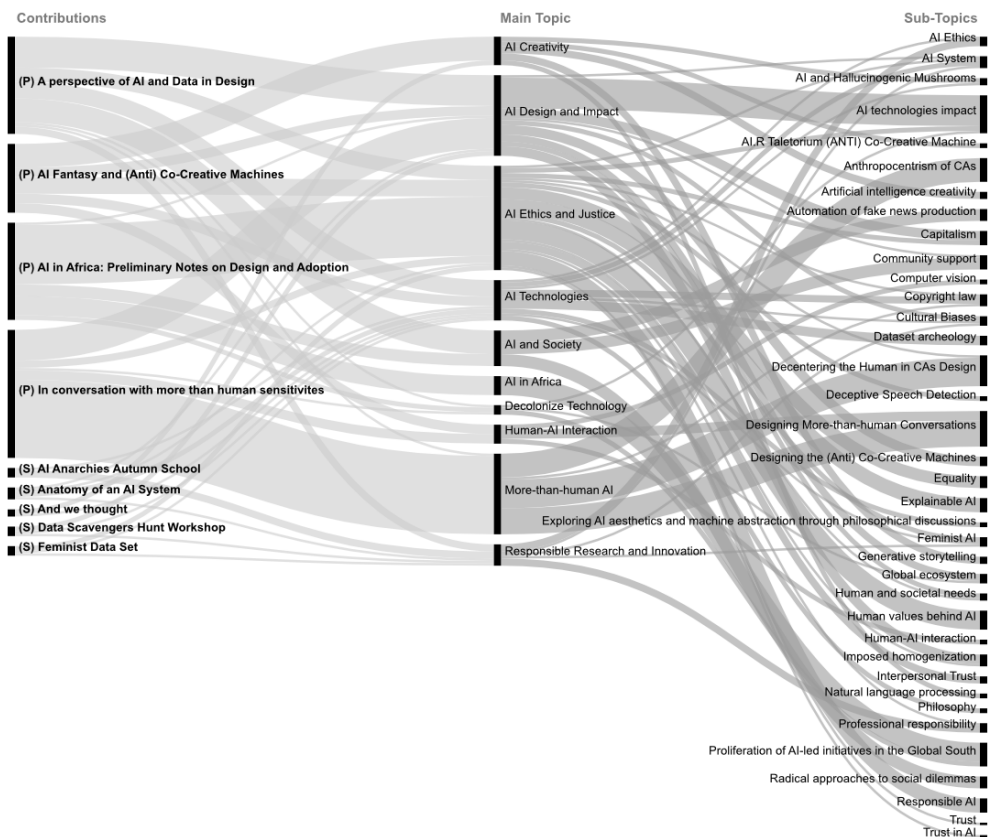


Fig. 1  
A map of Open Debate contributions and the interrelated nature of their contents. (P) papers, (S) case histories contained in the Stories section.

## Data, Power and Diversity

Bias and equity are a problem for data justice, as big data and algorithms can worsen unjust distributions, not only creating new inequalities but amplifying existing ones (Onuoha, 2018). Datafication, the ubiquitous quantification of life already described by Van Dijck (2014), remains a central paradigm, asking us to examine how risks and benefits are distributed among social groups and who controls the priorities that drive the design of technological systems (Hoffmann, 2019), to avoid abuses related to data-driven prediction steeped in bias (Sen & Ganguly, 2020). The accelerated development of AI has concentrated immense power in the hands of tech companies and states (Zuboff, 2019), exacerbating the “epistemic privilege” of those who not only impose a limited worldview but are also less able to recognize injustices (D’Ignazio & Klein, 2020).

The study of training datasets underlying AI systems has meanwhile become more difficult with the rise of generative models that exponentially increase the size and complexity of datasets, which also contain huge volumes of copyrighted material, raising thorny questions about the fair use and legal status of synthetic results that have no discernible human authors. The proliferation of these models has essentially automated the generation of fake content, with serious implications for information integrity and shared reality.

In this author-conducted interview, Kate Crawford emphasises the need to investigate the logic behind the development of artificial intelligence and challenges designers to engage with AI as an inherently political phenomenon. The study of datasets and algorithms remains essential but increasingly difficult, as responsible innovation requires an analysis not only of ethics but also of the structural power inequalities that shape such systems, which have become too onerous to inspect, however. The perspectives offered by Crawford resonate with a broader debate in design research, underscoring the importance of understanding the nuances and implications of data-driven and algorithmic design. A critical, interdisciplinary approach is essential to ensure that AI systems reflect ethical and inclusive values.

Caroline Sinders and her *Feminist Data Set* project (in Stories) also challenge the traditional notion of data as an objective and neutral entity by highlighting its subjective and political nature, speaking of the attempt to create a feminist AI that has become a deep reflection on the biases and power structures embedded in our data-driven society. Design, in this context, becomes a tool for social and political discourse, a means of navigating the complexities of our data-driven world<sup>2</sup>, which needs to cultivate different perspectives.

### **Decentralising the Human, to Understand It Better**

As we move toward a future in which AI participates, it becomes imperative to embrace a “more than human” approach to design. By recognizing the intertwining of humans and nonhumans in AI systems, we can address biases and limitations, promote inclusivity, and develop AI as responsible agents that actively participate in our lives to avoid negative impacts on other species and the environment (DiSalvo & Lukens, 2011). Embracing the more-than-human is not just a design philosophy; it is a path to an inclusive and sustainable future (Forlano, 2016). Posthumanist concepts from fields such as philosophy and critical theory are beginning to influence design theory and practice. As described by Forlano (2017), posthumanist perspectives challenge the human-centred paradigm by decentering it and considering the agentivity of nonhuman actors. This expands the scope of design beyond individual users to the scale of complex socio-technical systems, increasing its capacity for inquiry. Posthumanist theories can provide alternative epistemologies for design as pluralistic “nomadic practices,” rather than fixed disciplinary bases (Wakkary, 2020), and new methodologies for integrating non-human components into participatory, speculative and critical design processes (Coskun et al., 2022).

In their article, Iohanna Nicenboim, Elisa Giaccardi and Johan Redström delve into the intricate relationship between humans and increasingly influential AI technologies in public life, emphasising the intertwining of humans and non-humans within AI-powered systems. Using conversational agents (CAs) as the primary lens, the authors argue for a more-than-human perspective to better understand and address real-world challenges arising from our daily encounters with AI.

## Decolonization

Because many AI systems are developed through a predominantly Western lens, in a world fueled by these information mediation systems there is a danger of neglecting the social, cultural, and environmental nuances of all others. Birhane (2020) critiques the problematic “algorithmic colonisation” when Western AI models are exported unreflectively as inadequate “solutions” that can disadvantage local communities. Here, it is necessary to recognize the persistent “colonisation” in AI systems and to draw on decolonial theory as a perspective to realign technology with a pluralistic ethic (Mohamed, Png & Isaac, 2020).

The article by Muhammad Adamu and Makuochi Nkwo reiterates these principles, outlining strategies for developing AI in Africa that resist exploitative paradigms, are rooted in African values, created within local innovation systems, focused on societal priorities, and foster equity. Their contribution emphasises that AI must be contextually designed to empower marginalised groups and build trust with them in order to avoid replicating existing power structures through a logic of data ownership. Designers are then given a clear field of action, which appeals to their ability to embrace different epistemologies, even going so far as to reject or overturn the axiomatic paradigms inherent in technological development strategies.

### Open to Different Languages and Forms of Inquiry

Designing solutions for extreme contexts and then transferring them to everyday life is a familiar strategy for design (Schlacht & Words, 2007). However, when faced with the uncertainty of a chaotic and unpredictable system without the proper experimental tools to find answers, it can be useful to broaden the perspective to other languages and disciplines, bringing us the role reversal of using extreme tools in our normal context. Many artists and designers have begun to embrace speculative and artistic practices in this sense. Today they are seen as speculative and artistic experiments, but with the impact of climate change they will also become more common ways of everyday life (Forlano, 2017).

Through a series of experiments, Predrag K. Nikolic and Giacomo Bertin explore human-machine communication as a moral imperative, using the concept of trust and staging dadaistic interactions between robots. While opening up new creative possibilities, they also raise questions about human control and machine autonomy. The authors warn of the danger of impoverishing the creative experience by depriving it of the sensory and emotional stimuli typical of human expression.

Similarly, Sineglossa's *And we thought* (in Stories), is an art project that explores co-creation with AI by training a system to generate psychedelic stories from hallucinogenic travelogues. Artists collaborate with the creative distortions of the machine, which provides cues to produce posters, albums, and films, reversing human-machine roles.

Other Stories show how these strategies can also be practised in educational settings. The AI *Anarchies Autumn School*, curated by Maya Indira Ganesh and Nora N. Khan, sought to provoke critical reflection on existing paradigms within AI ethics and to



encourage participants to become aware of their own agency in relation to the future. The workshop *Data Scavengers Hunt*, curated by Paolo Cardini and Andrea Cattabriga, invited participants to directly experience how AI can create cultural distortions, placing them in the dystopian condition of being able to explore the world only through applications mediated by biased algorithms. These projects demonstrate how speculative, artistic, and interdisciplinary practices can help navigate uncertain, complex contexts and expand the capacity to understand and shape change. Design thus embraces a critical dimension of ongoing inquiry and experimentation that is crucial to imagining sustainable futures.

We present these contributions inviting designers to adopt a “philosophy of decentering” (Rivenburgh & Manusov, 2010), to approach and discuss cultural perspectives, beliefs, roles, and assumptions around the many socio-technical facets of AI systems, convinced of the need to move discourses about the future of both the system of design practices and design research beyond fences and into the depths of new meanings.

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