Artistic Potentials of Fallacies in AI Research

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Abstract

This paper seeks to identify aesthetically productive contradictions and obstacles in AI research. Based on Melanie Mitchell's much-discussed 2021 paper "Why AI is Harder Than We Think", it seeks to outline four areas of artistic potential that are related to the four "fallacies" in AI research identified by Mitchell. These are underlying assumptions of AI research that have contributed to overconfident predictions. The paper uses these fallacies as a point of departure to discuss the relation of AI research and artistic practice, not from a utilitarian or problem-solving point of view, but rather in order to identify how frictions and fallacies disclose aesthetically productive areas. The paper seeks to demonstrate how these fallacies are not only shortcomings with regard to our understanding of intelligence, but how they are actually at the core of what constitutes aesthetics and artistic practice.

1 Introduction

Melanie Mitchell's 2021 paper "Why AI is Harder Than We Think" [Mitchell, 2021] is an extraordinarily succinct and astute critique of some of the underlying assumption of much AI research. It has stimulated a lively debate and has shifted the focus towards a much-needed discussion of the terms, goals, and presuppositions of this rapidly developing field. After sketching the cyclic nature of AI springs and winters, Mitchell's paper discusses four internal conceptual obstacles of AI that account for the alternations of expectations and disappointments that have accompanied the waves of AI breakthroughs since its inception. This paper seeks to response to these obstacles by demonstrating how they are not only shortcomings with regard to our understanding of intelligence, but how they are actually at the core of what constitutes aesthetics and artistic practice. In doing so, the aim is not to outline how music may aid in overcoming these shortcomings, but rather to sketch aesthetic potentials of these inherent contradictions.

In what follows, I will go over the four "fallacies" outlined by Mitchell, in, as she writes, "how we talk about AI and in our intuitions about the nature of intelligence" [Mitchell, 2021, p. 2] and relate each one to a set of questions of artistic practice and aesthetic reflection. Some of these questions are rooted in classical problems that have defined the field of philosophical aesthetics at least since Kant while others have emerged in connection with more recent technological developments. Due to the brevity of this paper, these larger discursive context will only be hinted at.

In AI research, "creativity" is generally assumed to be the pinnacle of human intelligence and artistic creativity is hence a particularly prestigious field of application. However, approaches to computational creativity in the arts often presuppose what could be termed a "nominalist" definition of computational creativity as the "philosophy, science and engineering of computational systems which [...] exhibit behaviors that unbiased observers would deem to be creative"[Colton and Wiggins, p. 21]. Hence, artifacts that mimic or blend stylistic features from historical epochs may be deemed creative by some. However, such a definition disregards the self-reflexivity of artistic creativity. It leads away from the question of how creativity is transformed and conditioned by technological, material and conceptual frameworks and the ways in which artistic practices can be seen as responses

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and transformations of these conditions. Artistic creativity is no static capacity awaiting to be modeled artificially; it brings something into existence that transforms the realm of the sensible by revealing something about its own process of coming-into-being.

Other strands of computational creativity stress the notion of human-computer "co-creativity" [Davis, 2013, Gioti, 2020]. It doesn't only serve to express a shared agency but it also highlights how human creativity is always entangled with the evolution of tools and technologies. This is why all creativity is always already *co*-creativity; it is produced *with* technology, material, language, space, human and non-human entities, conditions, as well as cultural and social conditions.

Instead of understanding the relation of AI and the arts as one in which a technology may solve pre-existing problems, model creativity, or accelerate the production of novelty and instead of celebrating a technology's awesome powers in emulating certain human capacities, this paper seeks to identify productive potentials of resistances, frictions, and contradictions. In this way, the encounter of AI and artistic practice can reveal genuinely artistic questions. It may let us understand fundamental questions of aesthetic experience and artistic production in a transformed way.

Reflecting on the four fallacies described by Mitchell lets us rethink the relation of AI and artistic practice from a number of vantage points. As our ways of experiencing the world are transfomed and mediated by AI technologies, artists can explore AI's potential as material, reveal its implicit aesthetic assumptions in how it conceives perception and intelligence, concretize the abstractions that increasingly govern us, and rethink the relation of computation and corporeality.

However, this short paper is not intended as an exhaustive study of the artistic implications of Mitchell's text. It does not refer to specific musical examples, but it rather outlines an aesthetic position and aims to serve as a starting point for a discussion on the relation of aesthetic experience, artistic practice and AI.

2 General and Particular

Drawing on the philosopher Herbert Dreyfus [Dreyfus, 2012], the first fallacy Mitchell describes has to do with the idea of "first steps". This is the assumption that there is a continuum of intelligence connecting the solutions to specific problems with general intelligence. A breakthrough in a specific area, playing Chess for example, is assumed to be a first step towards an all-embracing intelligence of universal nature. We now have models that can perform some narrowly defined tasks very well. However, the ability to transfer knowledge from one area to another, which is certainly one defining feature of human learning, is poor or lacking. We can thus identify a discontinuity between a particular form of knowledge – such as a certain tendency in a certain data set – and a general, abstract and transferable form of knowledge.

It can be argued that the exposition of a sensuous particularity, of an irreducible singularity[Mersch, 2014], is a defining feature of aesthetic experience. This idea can be traced back to Kant's concept of aesthetic judgment, in which the object's "particularity, its singularity is not erased but is precisely that which is judged in the aesthetic judgment"[Villinger, 2019, p. 212]. Rather than absorbing the specificities of the object in a general concept, aesthetic experience revolves around an object's uniqueness or a moment's unrepeatability. On the other hand, there are of course general and abstract procedures at work in music. For example, the composition of a piece of music may rely on rules, stylistic conventions, or a coherent formal logic that have a general character. However, these rules only reveal themselves in the specific musical constellations of particular works. Moreover, such rules vary from piece to piece, they are paradoxically "particular" generalities, there to be discovered by the listener. Hence, there is a tension between the generality of the rules and the specificity of the musical situations, timbres, forms, and structures that convey this generality. One may argue that a piece's identity is dialectically grounded in the way it contradicts its stylistic rules and conventions; in the way it differs from the general.

What makes aesthetic experience meaningful is the *shared* experience of a sensuous concreteness, a particularity, such as a particular sound, gesture or melody. For example, a musical composition exposes a specific timbre as it may be experienced, not the efficacy of spectral transformations in general. By trying to capture and reduce complexity, machine learning approaches seek to abstract from particular features. This allows for the recognition of sound properties or the generation of music in certain historical styles. In doing so, models are trained on the basis of concrete, and mostly

labeled, data. Their functionality, however, is described by means of general terms, such as "pitch recognition" or "source separation" and they are said to be able to generate music in certain musical styles, as though the model had captured the abstract essence of the notion of "pitch" or "Baroque music". This generality hides a particularity. It hides that it is a symbolic operation resulting from a specific optimization process based on very particular data.

Artistic practice, on the other hand, can be said to present what is concrete, particular, and material. It sets up relations between concrete elements thus allowing them to be experienced in an aesthetic context. Instead of reducing the concrete to the generality of a representational scheme, it concretizes, makes palpable, audible, and visible. As the philosopher Dieter Mersch puts it, artistic thought "has an eye for the useless, the imponderable, and the marginal, at least if it is examining the particularities of an object" [Mersch, 2015, p. 134-135]. The difficulties to generalize from the solutions to specific problems, the particular biases, distortions and particularities, expose the irreducibility of the concrete. Here is where artistic thought can enter a productive, dialectical relation with the abstractions of machine learning. Not in order to overcome the problem of generalization, but in order to aesthetically explore its inherent contradictions, in order to turn it into artistic material. As Adorno writes, "the artwork must present through its own concretion the total nexus of abstraction and thereby resist it" [Adorno, 1997, p. 135]. In this way, abstract representation can again become concretely experiential.

3 Easy and Hard

The second fallacy Mitchell describes is the idea that "easy things are easy and hard things are hard" to model with AI technologies. Researchers and technologists have failed to acknowledge that what is easy for humans may not be easy for machines, and what is hard for humans, such as playing Chess, may actually be easier for machines. This is often based on an emphasis of reasoning as the premier ability of thought, neglecting the complex multiplicity of embodied and non-conscious forms of intelligence, impulses, and emotions that allow humans (and non-humans) to perform certain tasks.

From an artistic point of view, this fallacy is interesting for at least two different reasons. The performative arts, such as music and dance, often play with and invert what is easy and what is hard. A virtuoso musical performance or the skilled movement of a body seem to be liberated from the heaviness and inertia of physical reality. The hardest musical passage may seem easy. At the same time, the production of a single tone on a bowed string instrument may be slowed down and appear to be an immensely difficult task, full of sonic and physical complexity. Likewise the movement of a hand, a posture, a pencil stroke, the silence between two notes, can be brought into focus aesthetically to reveal an overwhelming complexity. Demonstrating the easiness of what is difficult and the complexity of what seems simple has enormous aesthetic potential. Here we can see how art's capacity to problematize what we take for granted.

A second way in which this fallacy can be productive from an artistic point of view, is how it points to another form of reasoning that is alien to human thought. The philosopher Beatrice Fazi speaks of a "incommensurability between the abstractive choices of humans and those of computing machines" [Fazi, 2021, p. 66]. Deep learning models can produce representations that challenge translation into human epistemic terms, "changing the epistemic possibilities of justification and explanation, effectively reshaping how science imparts information and knowledge" [Fazi, 2021, p. 63]. The nonproportionality of the difficulty of certain problems for humans and machines thus also points to this incommensurability of human and computational representations. Here lies an artistic potential that is tied to the core of aesthetics itself, finding forms of representation that render experiential what has not yet been perceptible. Art can contribute to developing forms of representation; it can work at forms of translation and transposition of computational and human epistemic realms.

4 Wishful Mnemonics

The third fallacy outlined by Mitchell concerns terms commonly used in AI research to describe certain abilities to be modeled, including "intelligence" itself. Drawing on Drew McDermott, Mitchell terms these expressions "wishful mnemonics" [McDermott, 1976]. Anthropomorphizing terms, such as "learning", "listening", "reading", "understanding", and "vision" suggest a comparability between particular machine abilities and human capacities. Such terms are often used to describe and measure certain machine abilities on the basis of standardized benchmark tasks and data sets. For example,

the inexhaustibly complex activity of "reading" is equated with how well a system can perform a very particular task on a very particular data set. This points to the impossibility to conclusively determine and possibly formalize perceptual, experiential and cognitive activities.

What is productive, however, is how these vast questions themselves come into focus and how the attempts to prosthetically reconstruct these abilities transforms these very abilities themselves. An AI-mediated form of listening changes what sound means to us and how we experience it. Likewise a poem strives to redefine reading, a sound installation develops a new form of listening, and a photograph may have the potential to create a new way of seeing. In these sense, the inevitable shortcomings of terms such as "learning" and "listening" in AI research actually disclose their inexhaustible complexity. At the same time, much like artistic practice, AI transforms these abilities, it augments, contrasts, caricatures, supplements, distorts and reduces how we listen, see and understand.

5 Corporeality

The fourth and final fallacy formulated by Mitchell has to do with the role of the body in cognitive processes. As Mitchell writes, "The assumption that intelligence can in principle be 'disembodied' is implicit in almost all work on AI throughout its history" [Mitchell, 2021, p. 6]. Indeed, much AI research implicitly or explicitly assumes a radical division between the body – which is basically assumed to be a passive controllable machine – and the brain, site of the intellect, which is assumed to be computational in essence. While there are fields, such as embodied AI, that study how intelligent agents interact with physical environments, these assumptions are still dominant.

There is a vast amount of empirical and theoretical research ranging from neuroscience to philosophy and the arts that challenges and debunks the idea of such a radical division [Dyson, 2009, Ihde, 2002, Merleau-Ponty, 2013, Peters et al., 2012]. Embodied cognition and phenomenological concepts of embodiment let us conceive cognitive processes and aesthetic experience as entangled with our physical existence. We experience sound, the materiality of a painting, the spatiality of an installation, the bodily presence of an actor, and the movements of a dancer through our bodies. Cognition involves our bodies as a whole and even larger spatial, social, temporal, historical, and technological contexts. We mentally mirror movements we observe, we imagine sound sources we cannot identify, we become part of a space because we are spatial things ourselves. As Varela, Thompson and Rosch write in their seminal book *The Embodied Mind*, "knower and known, mind and world, stand in relation to each other through mutual specification or dependent coorigination" [Varela et al., 1992, p. 150]. It is far beyond the scope of this text to represent the general and multifaceted relevance of embodiment in the arts, which is of course at the core of a vast amount of artistic tendencies and traditions. I rather want to point out the specific corporeality of sound and listening and the way in which the computational processing of sound is entangled with this corporeality.

The involvement of the living body in experience is perhaps more evident in listening than in seeing. Listening makes us aware of our own physical presence in the world and our connection to other bodies. As the philosopher Jean-Luc Nancy writes, "the sound that penetrates through the ear propagates throughout the entire body" [Nancy, 2007, p. 14]. In a sense, in listening we experience ourselves as resonant bodies and what Varela termed the "dependent coorigination" of knower and known; we resound as we listen. Listening is thus a prime example of an irreducible embodied form of cognition involving non-conscious and bodily forms of resonance.

Moreover, computational processes have their own corporeality and materiality. They are implemented on physically existing machines and limited by their constraints. Algorithms may be studied as formal entities, but computational processes run in time while interacting with other computational processes, data, and the external world. In a way, the failure to account for the embodiment of human cognition also discloses the failure to acknowledge that algorithms have their own specific form of embodiment[Rutz, 2016]. Artistically, we can identify the possible nexus of computational and living corporeality as a site of great aesthetic productivity.

6 Conclusion

Mitchell argues that the four fallacies are symptomatic of the lack of "humanlike common sense" [Mitchell, 2021, p. 8] in AI. Common sense is assumed to be where formalization, modeling, and representation fail. Perhaps, however, these failures point to more fundamental complexities that

resist formalization and to the constitutive blind spots of any representation. Rather than helping artists to solve problems, AI can expose them and shed new light on where the aesthetic lurks, in our failures.

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