

The Cabinet of Wolfgang von Kempelen: AI Art and Creative Agency

Dejan Grba

Artist, researcher, and scholar
Belgrade, Serbia
dejangrba@gmail.com

Abstract

The aim of this paper is to expand the existing critical discourse of AI art with new perspectives which can be used to examine the creative attributes of emerging practices and to assess their cultural significance and sociopolitical impact. It discusses AI art projects that explore creative agency and associated topics such as authorship, authenticity, intellectual property, and labor. The focus is on works that exemplify poetic complexity and manifest the epistemic or political ambiguities indicative of AI science, technology, and business. By comparing, acknowledging, and contextualizing their accomplishments and shortcomings, the paper outlines the possible directions to advance the field.

Keywords

AI Art, Anthropomorphism, Artificial Intelligence, Authorship, Creative Agency, Creativity, Machine Learning.

Introduction

From a small community of computer artists who experimented with artificial intelligence (AI) in the 1970s, AI art has expanded, gained visibility, and attained cultural relevance since the second half of the 2010s. Contemporary AI art includes practices based on diverse creative approaches to, and various degrees of technical involvement with, the increasingly affordable machine learning (ML) architectures such as Deep Learning (DL). Its topics, methodologies, presentational formats, and implications are closely related with a range of disciplines engaged in AI research, development, and application. AI art is affected by epistemic uncertainties, conceptual challenges, conflicted paradigms, discursive issues, ethical, and sociopolitical problems in AI science and industry. Similar to other new media art disciplines, AI art has had an ambivalent relationship with the mainstream contemporary artworld (MCA), marked by selective marginalization and occasional exploitation. [1]

Its interdependence with AI infrastructures, technologies, and socio-economic trends, exposes AI art to a critical consideration within a broader cultural context. The existing literature comprises several studies of AI art and implicitly relevant works. For example, Mitchell [2], as well as Marcus and Davis [3], provide a conceptual, technological, and sociocultural critique of AI research. Kearns and Roth [4] and Pasquinelli [5] address the ethical, socio-

political, and cultural consequences of the AI's conceptual and technical issues, and inherent biases. Miller [6] includes AI art in his examination of creativity, and Żylińska [7] opens a discussion of AI's influence on visual arts and culture. Cetinić and She [8] provide an overview of AI research that takes art as a subject matter, outline the practical and theoretical aspects of AI art, and anthologize the related publications. Zeilinger [9] investigates the tactical and posthumanist values of AI art. I address the ambiguities that AI art shares with AI-related creative disciplines [10], the AI art's entanglements and cultural integration [11], and the dynamics of contemporary AI art. [12]

In this paper, I discuss AI art practices that explore the notions of creative agency, authenticity, authorship, intellectual property, and labor. I address the conceptual, expressive, and ethical aspects of these practices, focusing on works that exemplify poetic complexity and manifest the epistemic or political ambiguities indicative of AI science, technology, and business. By tracing these ambiguities I outline the possible directions to tackle the challenges and advance the field. The aim of this paper is to expand the existing critical discourse of AI art with new perspectives for understanding the conceptual and contextual nature of ML as a medium in the age when the arts, together with science and technology, are becoming increasingly responsible for changing ecologies, shaping cultural values, and political normalization.¹

Features

The poetic scope of AI art derives from computer art and generative art, and is primarily informed by the various phenomenological aspects of sub-symbolic ML systems. Themes such as creative agency, authorship, originality, and intellectual property are widely attractive to AI artists, popular with the media, and fascinating to the audience. The malleability of these notions was central to modernism and postmodernism, and artists have been addressing them with computational tools since the 1960s, so this recent surge of interest is probably due to a combination of the

¹ The paper's title references *The Cabinet of Dr. Caligari* (1920), a classic German Expressionist film about irrational and cruel machinations of authoritarian systems, and Wolfgang von Kempelen, the 18th century inventor of a fake chess-playing automaton called *Mechanical Turk*, with a human operator hidden in its cabinet stand.

novelty of DL, its processual opacity, and its informational or formal effects. However, artistic exploration of this territory has been challenged by the AI's most pervasive ambiguity—anthropomorphism.

Anthropomorphism manifests in various forms. One is a tendency to assign human cognitive or behavioral features to non-human entities or phenomena, which is often difficult to identify and sometimes has undesired consequences. It is complicated by the corporate AI's crowdsourcing of cheap, invisible, and underrecognized human labor for tasks such as dataset interpretation, classification, or annotation. [13][14] A converse form of anthropomorphic fallacy is to conflate the artists' creative agency with cumulative human creativity embedded in their tools, which simultaneously deprives artists of their own inventiveness, and lifts the responsibility off their creative acts. It often exploits the trope of the ever "blurring line between artist [ghost] and machine" [15], and involves experiments that are supposed to establish "who is the [real] artist" or "what art is better" by manipulating the preferential conditions of human subjects tasked with evaluating human- and machine-produced artefacts. [16][17] Such experiments are largely naïve or manipulative because they presume, and instruct the subjects, that their test material *is* art while omitting two fundamental distinctions: *who* considers whether something is an artwork, and *why*. [18] They disregard that *art is artificial by definition*, and ignore well-informed notions about the complex relationship between creative agency, authorship, and technology. [19][20][21]

The Elusive Artist

Pioneering AI artist Harold Cohen had an ambiguous relationship with machinic creative agency and flirted with anthropomorphic rhetoric about his life-long project *AARON* (1973-2016) which experimented with translating and extrapolating some components of human visual decision-making into a robotic drawing/painting system. [22] Not surprisingly, the most popular contemporary AI art belongs to the saccharine reiterations of Cohen's approach, in which artists "teach" their robots how to paint, such as Pindar Van Arman's *Painting Robots* (2006-) or Joanne Hastie's *Abstractions (Tech Art Paintings)* (2017-). [23][24] These projects "serendipitously" merge technically competent execution with weekend painter's enthusiasm, dilettante aesthetics, conceptual ineptness, and ignorance of art-historical context. The meaning of the word "art" collapses into banal, camera-driven visualizations, rendered and presented with amateurish self-confidence. Anthropomorphism is advocated within the art-academic domain as well, for example by Simon Colton's verbiage about his software project *The Painting Fool* (2012) that "will one day be taken seriously as a creative artist in its own right." It aims to dramatically expand the "artistic range" of Cohen's *AARON* by introducing the interface that could be trained by different human artists to critically appraise its own work, and (in future versions) the work of other artists. [25]

Fewer artists address the subtlety of this topical range. One of them is Adam Basanta. In his installation *All We'd*

Ever Need Is One Another (2018), a custom software randomizes the settings of two mutually facing flatbed scanners so that in every scanning cycle each captures a slightly altered mix of the facing scanner's light and its own unfocused scanning light reflected off the facing scanner. The perceptual hashing algorithms then compare each scan to the images in a large database assembled by scraping images and image metadata from freely accessible online repositories of existing artworks. If the comparison value between the scan and its most similar database image exceeds 83% based on the parameters such as aspect ratio, composition, shape, and color distribution, the software declares a "match", selects the scan for printing, and labels it with the matching image metadata. [26] When it selected and labeled one of the scans as *85.81% match: Amel Chamandy 'Your World Without Paper', 2009*, Canadian artist Amel Chamandy initiated a legal action about the intellectual property rights against Basanta because of the reference to her photograph although Basanta's print is not for sale, and he apparently does not use it for direct commercial gains by any other means. *All We'd Ever Need...* disturbs the concepts of authorship, originality, and intellectual property by legitimately and consistently applying the functional logic of ML, while the intricacies of the lawsuit it triggered exemplify the intellectual and ethical issues of our tendency to crystalize the commercial rights of human creativity. [27] It links the notion of "autonomously creative" AI with appropriation strategies but couples its playful production setup with a tangible referencing system. This allows it to go beyond "preaching to the choir" with a satirical or cynical reaffirmation of cultural trends, towards engaging (and provoking) mainstream artists, their agents, collectors, and audience. It effectively critiques the chronic rigidity of intellectual property conventions in general, and particularly the emerging modes of crypto-based art monetization.

Basanta's and other artists' exemplar works such as Nao Tokui's *Imaginary Landscape* and *Imaginary Soundwalk* (both 2018) [28], or Anna Ridler's *Myriad (Tulips)* (2018) and *Mosaic Virus* (2019) [29], approach AI both as a criticizable technology and a sociopolitical complex, and recognize the variable abstraction of technologically entangled authorship. They demonstrate that crucial aesthetic factors such as decision-making, assessment, and selection are human-driven and socially embedded regardless of the level of complexity or counter-intuitiveness of the tools we use for effectuating these factors. They remind us that our notion of art is a dynamic, evolving, bio-influenced, and sociopolitically contextualized relational property which needs continuous cultivation.

Performative Aesthetizations

Performance artists who enjoy corporate AI sponsorship tend to emphasize dubious human-centered notions of creative agency through sleekly anesthetized mutations of earlier avant-garde practices. For example, Sougwen Chung's projects, such as *Drawing Operations Unit: Generation 2* (2017, supported by Bell Labs) [30], draw a

comparison with Roman Verostko’s algorist compositions from the 1980s and 1990s. [31] Whereas Verostko discreetly encapsulates his formal experiments into a relationship between a pen-plotter and its material circumstances, Chung uses the theatricality of her homo-robotic collaboration as a “spiritualizing force” to mystify the manual drawing process—which is by nature highly improvisational and technologically interactive.

Similarly, Huang Yi’s robotic choreography *HUANG YI & KUKA* (2015-, sponsored by KUKA) [32] spectacularizes the metaphors of harmonious human-machine interaction and mediates them safely to the passive spectators, while the referential Stelarc’s performances since 1976, such as *Ping Body* (1996), emphasize the existential angst and uncertainty of shared participatory responsibilities between the artist, the technology, and the audience who all have a certain degree of manipulative influence on each other. [33] Also sponsored by KUKA, Nigel John Stanford’s musical performances, such as *Automatica: Robots vs. Music* (2017) [34], can be viewed as encores of Einstürzende Neubauten’s concerts from the 1980s “spiced up” for tech-savvy cultural amnesiacs. [35] Rehearsed beyond the point of self-refutation, Stanford’s “improvisations” stand in as formally polished but experientially attenuated echoes of Einstürzende’s rugged guilty pleasures in sonic disruption.

With high production values and aesthetics palatable to a contemporary audience, these AI-driven acts largely evade the unfavorable comparisons with their precursors and serve as marketing instruments for their corporate sponsors by promoting vague notions of a robotically-enhanced consumerist lifestyle. Their persuasiveness relies on our innate anthropocentrism, myopic retrospection, and susceptibility to spectacles.

The Uncanny Landscapes

The exploration of anthropomorphism in AI art often involves the uncanny appearance of artificial entities. Uncanniness is the occasional experience of perceiving a familiar object or event as unsettling, eerie, or taboo. It can be triggered in close interaction with AI-driven imitations of human physical or behavioral patterns. [36]

Some artists approach it by extracting human-like meaningfulness from the machinic textual conversation, for example in Jonas Eltes’ *Lost in Computation* (2017) [37] with reference to Ken Feingold’s installations such as *If, Then, What If*, and *Sinking Feeling* (all 2001). [38] In these works, natural language processing systems provide semantically plausible but ultimately senseless continuation of narrative episodes which allude to the flimsiness of the Turing test and serve as (vocalized) metaphors for our lives. They extend the experience of uncanny awkwardness into the absurdity of miscommunication and the overall superficiality of the systems tasked to emulate human exchange.

Ross Goodwin and Oscar Sharp used this type of slippage to disrupt the cinematic stereotypes in their short film *Sun-spring* (2016). Trained with the 1980s and 1990s sci-fi movie screenplays found on the Internet, Goodwin’s ML software generated the screenplay and the directions for Sharp

to produce *Sun-spring*. [39] The film brims with awkward lines and plot inconsistencies but qualified with the top 10 entries of the Sci-Fi London film festival’s 48-Hour Film Challenge. *Sun-spring* reverses the logic of movie search algorithms and playfully mimics contemporary Hollywood’s screenwriting strategies largely based on regurgitating successful themes and narratives from earlier films. [40] By regurgitating *Sun-spring*’s concept and methodology two years later, Alexander Reben produced *Five Dollars Can Save the Planet* (2018), “the world’s first TED talk written by an A.I. and presented by a cyborg.” A YouTube comment by MTiffany fairly deems it “Just as coherent, relevant, and informative as any other TED talk.” [41]

Ironically, projects that combine uncanniness with our apophenic perception in order to “humanize” AI often contribute to diverting attention from pertinent sociopolitical issues. For example, with *JFK Unsilenced: The Greatest Speech Never Made* (commissioned by the Times, 2018), Rothco agency aimed at contemplative uncanniness by exploiting the emotional impact of sound to reference the romanticized image of John F. Kennedy. [42] Based upon the analysis of recorded speeches and interviews, Kennedy’s voice was deepfaked in a delivery of his address planned for the Dallas Trade Mart on 22 November 1963. The voice sounds familiar, but its cadence is uneven, so the uncanniness relies mainly on the *context* of the speech that the young president never had a chance to give. However, even with perfect vocal emulation, this exercise could never come close to matching the eeriness and deeply problematic political context of Kennedy’s televised speech on 22 October 1962 about the Cuban missile crisis in which sheer good luck prevented multilateral confusion, incompetence, ignorance, and insanity of principal human actors from pushing the world into a nuclear disaster. [43]

Visual deepfakes, such as Mario Klingemann’s *Alternative Face* (2017) [44] or Libby Heaney’s *Resurrection (TOTB)* (2019) [45], approach uncanniness by simultaneously emphasizing and betraying the persuasiveness of statistically rendered human-like forms. This strategy was prefigured conceptually and procedurally by Sven König’s *sCrAmBIEd?HaCkZ!* (2006) that used psychoacoustic techniques for continuous real-time audiovisual synthesis from an arbitrary sample pool of stored video material to mimic any sound input. [46] Perhaps this innovative project has been largely forgotten because König pitched it to the VJ scene instead of using it to develop his own artworks that establish meaningful relations between stored videos and input audio. Along with the sophistication of his technique, König’s expressive mismatch may have anticipated some issues of contemporary AI art.

The Mechanical Turkness

The sociopolitical aspects of anthropomorphism can be effectively addressed by artworks that expose human roles and forms of labor behind the “agency” or performative efficacy of corporate AI. For example, Derek Curry and Jennifer Gradecki’s project *Crowd-Sourced Intelligence Agency (CSIA)* (2015-) offers a vivid educational journey

through problems, assumptions, or oversights inherent with ML-powered dataveillance practices. [47] It centers around an online app that partially replicates an Open Source Intelligence (OSINT) system, and allows the visitors to assume the role of data security analysts by monitoring and analyzing their friends' Twitter messages, or by testing the "delicacy" of their own messages before posting them. The app features an automated Bayesian classifier designed by the artists and a crowdsourced classifier trained on a participant-labeled data from over 14,000 tweets, which improves its accuracy by the visitors' feedback on its previous outputs. *CSIA* includes a library of public resources about the analytic and decision-making processes of intelligence agencies: tech manuals, research reports, academic papers, leaked documents, and Freedom of Information Act files. This relational architecture offers an active learning experience enhanced by the transgressive affects of playful "policing" in order to see how the decontextualization of metadata and the inherent ML inaccuracies can distort our judgment. It also serves as a gentle reminder of our complicity in the politically problematic aspects of applied AI through conformity, lack of involvement, or non-action.

Similarly, in RyBN and Marie Lechner's project *Human Computers* (2016-2019), multilayered media archaeology of human labor in computation since the 18th century offers revelatory insights into the use of human beings as components of large computational architectures. [48] It shows that many AI applications have in fact been simulacra, mostly operated by echelons of underpaid workers, which corporate AI euphemistically calls "artificial Artificial Intelligence" (AAI) or "pseudo-AI". This foundational cynicism of corporate AI also indicates that its development imposes an exploitative framework of cybernetic labor management. A sub-project of *Human Computers*, titled *AAI Chess* (2018), was an online chess app with three all-human playing modes: human vs human, human vs Amazon MTurker, and MTurker vs MTurker. Two years later, Jeff Thompson "replayed" *AAI Chess* with his performance *Human Computers* (2020) in which the audience members were tasked to manually resolve a digital image file (Google StreetView screenshot of the gallery) from its binary form into a grid of pixels. With 67 calculations per pixel, the complete human-powered image assembly takes approximately eight hours. [49] Here, the visitors' enactment of automated operations asserts how a combination of complexity and speed in pervasive technologies makes them difficult to understand and manage by an individual.

By wittily "exploiting" human labor to emulate the features of AI systems, these projects remind us that the "Turk" in AI is still not mechanical or artificial enough, it resists "emancipation", and it is not easy to make it more "autonomous". Their self-referential critique also points to the ethically questionable use of crowdsourcing in art practices, exemplified by earlier Aaron Koblin's projects *The Sheep Market* (2006), *10,000 Cents* (2008), and *Bicycle Built for Two Thousand* (with Daniel Massey 2009). [50]

However, artistic attempts to approach computational creativity through active open-sourced participation can be

equally undermined by muddled anthropomorphic notions. Seeing ML as a tool that "captures our shared cognitive endowments", and "collective unconscious or imagination" [51], Gene Kogan initiated a crowd-sourced ML project *Abraham* in 2019 with a goal to redefine agency, autonomy, authenticity, and originality in computational art. In the initial two parts of the incomplete four-part introduction, Kogan describes *Abraham* as "a project to create an autonomous artificial artist, a decentralized AI who generates art", and provides an elaborate, semantically correct but conceptually derisive, discussion of this idea. [52]

Issues

These examples show that, through success or failure, AI art expands the idea of technologically entangled creativity, and that conscious consideration of the notion of creativity is a prerequisite for human creative endeavors. They also point to the human fallacies and biases, cultural constraints, and sociopolitical ambiguities, which manifest in the conceptual, methodological, ethical, and educational domains of AI art. By identifying, acknowledging, and understanding these issues, artists can refine their creative approaches and find new ways to intervene critically and productively in the AI-influenced social reality.

Conceptual

AI research struggles with encoding crucial aspects of human cognition—such as intuitive knowledge, abstraction, and analogy making—into machine intelligence. [53][54] Similarly, the conceptual realm of contemporary AI art is most deficient in interesting intuitions, meaningful abstractions, and imaginative analogies. The field particularly lacks projects that use AI systems as means to actualize strong concepts that effectively address wider perspectives or deeper issues of human existence. The lack of conceptual sophistication also manifests as a disproportion between the artists' computational dexterity, their eloquence in articulating relevant ideas, and their competence with broader artistic, cultural, or historical contexts.

AI art tends to be technologically self-referential as many works rely on tautological or circular concepts or themes based on the artists' ideas about ML. Various notions of bio-detached and socially unembedded creative agency permeate both AI art production and its popular representation through confused, ambiguous, or openly mystifying rhetoric about "machinic artistry". They promote a pseudo-romantic quest for human-flavored creative "essence" within ML systems (and AI in general) instead of demystifying them as sociopolitical apparatuses which have little to do with creativity per se, and are better understood as sophisticated tools for statistical analysis. [55]

Complex devices such as computers and software only represent the cumulative human creativity invested in their design, but the artists' self-awareness, reasoning, abstraction, conceptualization, generalization, and analogy-making in dealing with these tools inform the cogency of their

works. Their idiosyncratic mental abilities, senses, emotions, passions, obsessions, and incentives determine how they interact with the world and make their art. These qualities and aspects should be in the forefront of AI artmaking. Conversely, a responsible approach to AI art requires a clear understanding that—while different forms of creative intelligence are possible and explorable—computers, robots, or algorithms are not artists because they do not embody human social embeddedness, cognitive capabilities, skills, quirks, and, most importantly, *human motivations for making art*. [56][57] Art is a human dispositive within anthropological and sociocultural perspectives, so motivations for expressing creativity through artmaking are partially driven by the evolutionary competitive ambition; among its many functions, art is a socially-constructed system for displaying mating fitness (intelligence, proteanism, wit) and for exhibiting or gaining social status. [58] Therefore, it is crucial to acknowledge that the poetic qualities of our artefacts are inherently instrumentalizable as virtue signaling means.

Cognitive

Technocratic or technofetishist mentalities have been haunting computational arts since their outset [59], and continue to affect AI art. [60] Production, perception, and reception of the arts have always been evolving in a complex symbiosis with technological and sociopolitical trends [61], so AI artists—as well as the media and the cultural sector which represent them—should be critically aware of these entanglements. The poetics of AI art will remain a facile reflection of its technological reality as long as artists keep constraining their notions of expressive cogency to a *prima facie* relationship with technology.

Successful AI art projects utilize their entanglements self-consciously, as the conceptual, tactical, and existentially inherent features within a broader context of digital culture. However, the complexity, interdependence, and pace of change make digital tools difficult to keep under artistic control. Most notably, the breadth of procedural literacy and coding skills required for elaborate AI art production tend to shape the artists' poetic reasoning, exploration, and learning by directing their creative focus toward mathematics and programming. [62] In general, the engineering approach is usually a welcome enrichment of the "traditional" artistic mindset, but when it takes priority over other poetic factors, it reduces the scope of artists' critical engagement and the impact of their works.

AI artworks that aim at a tactical or critical approach toward creative agency and expressive authenticity are also affected by academism [63] which exposes them to recuperation due to the lack of methodological clarity, formal cogency, or experiential impact. Solidly conceived and well-motivated tactical concepts are sometimes rendered as dry, humorless, unengaging, critically ineffective, or counter-effective works. Together with a few other projects discussed in this paper, Tom White's *Perception Engines* (2018 and 2021) [64] and Ben Bogard's *Zombie Formalist* (2021) [65] exemplify this issue. [66]

Ethical

Artists have faced the challenges of ethical integrity conflicting with professional well-being throughout uneasy coevolution between the open-endedness of artistic proteanism, and the ambiguous flux of discourses, criteria, and hierarchies in the artworld and scholarship. Reputation games in art community are driven by fluid social networks, cliques, coteries, and intrigues, directed by unstable loyalties or affiliations, and shaped by fancy, fashion, and authority appeal. Their capricious dynamics tend to reduce merit to a temporal figure of speech while upholding cultural hegemonies, institutional privileges, and profit-driven power games. Such volatile vocational milieu—combined with inherently high production demands and intrinsic need for endorsement by corporate AI, MCA, or academia—makes AI artists particularly liable to becoming intentionally or subconsciously manipulative, to compromising their creativity, and to softening their critical edge. [67] If they strive for integrity, all actors in AI art should be able to recognize these systemically noisy professional value systems, assess them objectively, and correct them.

AI art reflects the artists' motivations and ethical decisions in making their works and building their careers within a context of zeitgeist-relative interferences between the arts, science/technology, cultural trends, and sociopolitical vectors. [68] Regardless of their modes of involvement with broader issues of AI ethics, artists are responsible for their own roles in shaping cultural values and political normalization. Most artists, authors, and cultural operators prefer to ignore this sensitive territory for the sake of professional survival, which may seem obvious but in fact, draws a higher order of ethical implications. As long as this territory is protected by hypocrisy and vanity, the cognitive value of art criticism will remain inferior and complacent to diminishing the transformative potentials of the arts.

Prospects

The expressive, intellectual, and ethical implications of AI art have been relevant primarily as reflections of the AI's challenges, shortcomings, and ambiguities, but the diversity and criticality of the field have been improving as the initial hype is toning down, and more artists start to explore ML. They can establish insights into all important aspects of the AI-influenced world through meaningful relationships with the issues, contingencies, and advances of AI technology. [69] In order to engage the audience with a lasting impact, AI artists need to balance their motivational sincerity and ideational cogency with procedural skills, and maintain a critical outlook on their poetic devices.

Competences

The ethos of maturely calibrated competencies deserves cultivation through playfulness, bricolage, technical and conceptual hacking, and imaginative discovery that characterizes other areas of emerging media art. This requires a realization that art happens not simply by adding material

configurations that no one has witnessed before, but by integrating organized matter into complex human interactions that help us understand the world differently, make us better, or give us a chance to become better. AI artists need stronger criteria for poetic thinking, and better multidisciplinary knowledge of historical, theoretical, cultural, and political contexts in which they produce and present their works. [70] They should catalyze their procedural proficiencies by systematic training in related non-computational art disciplines, so they can appreciate the cognitive and physical demands of creative work in a broader existential sense. By raising the awareness of technocentrism in their practices, AI artists can also promote the necessary changes in STEAM education.

Creativity

Corporate media, some art institutions, and artists misrepresent AI algorithms as “artists”, and uncritically sensationalize shallowly anthropomorphic AI art. By debasing artistically crucial cognitive abilities which constantly evolve in humans, they legitimize the regressive, intellectually offensive, and politically dangerous cultural ignorance. AI artworks that glamorize narrow concepts of creativity sustain the notions of monolithic authorship rather than advocating for heterogeneous or conjugated actualization of the expressive agency. Intentionally or unintentionally, they reinforce the anthropocentric models of creativity which benefit the problematic culture of proprietary mental labor. [71] As AI art diversifies, these compound aspects are becoming increasingly evident and addressed more clearly. However, the future poetic scope of AI art may be limited by conservative initiatives for imposing legal instruments which would keep the creative decisions under centralized profit-motivated control. The responsibility for tackling these issues lies not only with the artists, but also with scientists, entrepreneurs, cultural agents, and the public.

To address the allurements of exploitatively incentivized creativity (for its own sake) [72], artists should articulate and respect their methodologies as heterogeneous productive frameworks which inform the audience by stirring inquisitiveness and critical thinking, stimulating imagination, and encouraging progressive action. Within this context, there is an underexplored analogy between the normalization of children’s creative idiosyncrasies through socialization and the artists’ conscious or intuitive compliance to cultural trends. [73] By directing their transgressiveness beyond amusement or showmanship, AI artists can turn their wit and versatility into exemplars of meaningful resistance to the social imperatives and existential bleakness. [74]

Commitment

The socio-technical entanglements of AI art with corporate AI, MCA, and academia may support the forthcoming art projects, but also attenuate their criticality and expedite recuperation. A straightforward way for artists to tackle this precarious relationship is to not prioritize their careers

over their art, be open to taking genuine risks, and pursue systematic support with skepticism toward institutional rationales for art sponsorship. The key requirement of avant-garde art is a deep, constructive dedication to evolving potentially hazardous ideas and finding effective ways to share them with the thinking audience. It takes exceptional curiosity, inventiveness, and enthusiasm to do any creative work without anticipating affirmation, compensation, or success, and artists cannot maintain such costly order of priorities indefinitely. Therefore, both the public and the institutions should rise above their unspoken but unrealistic and ultimately cruel expectation that an artist should continuously deliver significant works.

In a broader prospect, the frameworks of contemporary art, science/technology, and education can provide significant incentives for the unbiased development and representation of AI art, thus enhancing the exploration of AI; but they need thorough reconsideration and reconceptualization in order to be self-critically adaptable for absorbing the knowledge and value systems that emerge from various relevant disciplines. [75] This requires close cooperation between artists, institutional representatives, and the public in exposing the political hegemonies, and criticizing the coercive evaluation criteria imposed by the artworld, academia, politics, economy, and the media.

Critique

The tactical impact can be improved by examining the cultural and sociopolitical contexts of AI technology and business, and by deeper probing, understanding, and problematizing the underlining concepts of intelligence, creativity, expressive agency, intellectual labor, and ownership. The flexibility and mutability of these concepts are inherent to sociocultural dynamics, and technologies such as ML or blockchain can be used to reconfigure them in interesting ways but challenge them less drastically than it is widely presumed. [76] By demystifying seemingly radical capabilities of their tools, AI artists can leverage questions of authorship and authenticity as critical assets with wide political significance. Empowered by the destabilizing value of humor, responsible treatment of these assets can build new insights about human nature and provide meaningful posthumanist perspectives. [77][78]

AI art also requires appreciation models for experientially, intellectually, and emotionally competent spectatorship keyed to an artworks’ demands. [79][80] This paper’s outlook on the creative agency in AI art aims to expand the exploratory discourse with new critical perspectives for understanding the nature of ML as an artistic medium. It concerns the accomplishments, shortcomings, and ambiguities across the AI art-related disciplines, and facilitates comparative insights into their sociopolitical, cultural, and historical contexts. As AI art diversifies, these critical perspectives can be taken to identify and study the creative attributes of emerging practices in order to assess their cultural significance and sociopolitical impact.

References

- [1] Dejan Grba, “Brittle Opacity: Ambiguities of the Creative AI,” (2021). *Proceedings of xCoAx 2021, 9th Conference on Computation, Communication, Aesthetics & X*, edited by M. Verdicchio, M. Carvalhais, L. Ribas, A. Rangel, Porto: 235-260. doi.org/10.5281/zenodo.5831884
- [2] Melanie Mitchell, *Artificial Intelligence: A Guide for Thinking Humans* (New York: Farrar, Straus and Giroux, 2019).
- [3] Gary F. Marcus and Ernest Davis, *Rebooting AI: Building Artificial Intelligence We Can Trust* (New York: Pantheon Books, 2019).
- [4] Michael Kearns and Aaron Roth, *The Ethical Algorithm: The Science of Socially Aware Algorithm Design* (Oxford: Oxford University Press, 2019).
- [5] Matteo Pasquinelli, “How a Machine Learns and Fails—A Grammar of Error for Artificial Intelligence,” *Spheres—Journal for Digital Cultures*, 5, (2019): 1-17.
- [6] Arthur I. Miller, *The Artist in the Machine: The World of AI-Powered Creativity* (Cambridge: MIT Press, 2019), 289-295.
- [7] Joanna Żylińska, *AI Art: Machine Visions and Warped Dreams* (London: Open Humanities Press, 2020).
- [8] Eva Cetinić and James She, “Understanding and Creating Art with AI: Review and Outlook,” *ACM Transactions on Multimedia Computing, Communications, and Applications*, Vol. 18, No. 2, Article 1:66, (2022): 1–22. doi.org/10.1145/3475799
- [9] Martin Zeilinger, *Tactical Entanglements: AI Art, Creative Agency, and the Limits of Intellectual Property* (Lüneburg: meson press, 2021).
- [10] Grba, “Brittle Opacity”.
- [11] Dejan Grba, “Immaterial Desires: Cultural Integration of Experimental Digital Art,” (2021). *Art, Museums and Digital Cultures: Rethinking Change*, edited by Helena Barranha and Joana Simões Henriques, Lisbon: IHA/NOVA FCSH and maat: 57-72. doi.org/10.5281/zenodo.5831887
- [12] Dejan Grba, “Deep Else: A Critical Framework for AI Art,” *Digital*, Vol. 2, No. 1, (2022): 1-32. doi.org/10.3390/digital2010001
- [13] Pasquinelli, *How a Machine Learns and Fails*, 7.
- [14] Żylińska, *AI Art*, 119-127.
- [15] Ahmed Elgammal, “When the Line Between Machine and Artist Becomes Blurred (2018)”, The Conversation website, accessed April 16, 2022, <https://theconversation.com/when-the-line-between-machine-and-artist-becomes-blurred-103149>
- [16] Miller, *The Artist in the Machine*, 289-295.
- [17] Antonio Daniele, Caroline Di Bernardi Luft, and Nick Bryan-Kinns, “What Is Human? A Turing Test for Artistic Creativity,” (2021), *EvoMUSART. Lecture Notes in Computer Science*, 12693.
- [18] Stefano Kalonaris, “Re Sound Art Machines and Aesthetics,” (2021). *Art Machines 2: International Symposium on Machine Learning and Art Proceedings*, School of Creative Media, City University of Hong Kong: 101-103.
- [19] Anthony O’Hear, “Art and Technology: An Old Tension,” *Royal Institute of Philosophy Supplement*, 38 (Philosophy and Technology), (1995): 143-158 (102).
- [20] Margaret A. Boden, *Creativity and Art: Three Roads to Surprise* (Oxford: Oxford University Press, 2010).
- [21] Antonio Daniele and Yi-Zhe Song “AI + Art = Human,” (2019). *Proceedings of the AAAI/ACM Conference on AI, Ethics, and Society*: 155-161.
- [22] Pamela McCorduck, *Machines Who Think: A Personal Inquiry into the History and Prospects of Artificial Intelligence* (Natick: A. K. Peters, Ltd., 2004), 517-518.
- [23] Pindar Van Arman, “Teaching Creativity to Robots (2016)”, TEDx Talks YouTube channel, accessed April 16, 2022, <https://youtu.be/YYu0PdJSzCA>
- [24] Joanne Hastie, “About (2021)”, Joanne Hastie’s website, accessed April 16, 2022, <https://joannehastie.com/pages/about>
- [25] Simon Colton, “The Painting Fool: Stories from Building an Automated Painter,” *Computers and Creativity*, (2012): 3-38.
- [26] Adam Basanta, “All We’d Ever Need Is One Another (2018)”, Adam Basanta’s website, accessed April 16, 2022, <https://adambasanta.com/allwedeeverneed>
- [27] Zeilinger, *Tactical Entanglements*, 94-108.
- [28] Nao Tokui, “Works (2019)”, Nao Tokui’s website, accessed April 16, 2022, <http://naotokui.net/works>
- [29] Anna Ridler, “Works (2019)”, Anna Ridler’s website, accessed April 16, 2022, <http://annaridler.com/works>
- [30] Sougwen Chung, “Selected Works by Sougwen Chung (2020)”, Sougwen Chung’s website, accessed April 16, 2022, <https://sougwen.com/artworks>
- [31] Roman Verostko, “Roman Verostko, Artworks since 1947 (2019)”, Roman Verostko’s website, accessed April 16, 2022, <http://www.verostko.com>
- [32] Huang Yi, “Huang Yi & KUKA (2021)”, Huang Yi’s website, accessed April 16, 2022, <https://huangyistudio.com/huangyiaandkuka>
- [33] Steve Dixon, *Cybernetic-Existentialism: Freedom, Systems, and Being-for-Others in Contemporary Arts and Performance* (New York: Routledge, 2019), 185-190.
- [34] Ulrike Götz, “Automatica: The Explosive Intersection of Robots and Music (2021)”, KUKA website, accessed April 16, 2022, <https://www.kuka.com/en-at/press/news/2017/09/nigel-stanford-automatica>
- [35] Alexander Hacke, “How to Destroy the ICA with Drills (2007)”, The Guardian website, accessed April 16, 2022, <https://www.theguardian.com/music/2007/feb/16/popandrock1>
- [36] Terrence Broad, Frederic Fol Leymarie, and Mick Grierson, “Amplifying the Uncanny,” (2020). *xCoAx, 8th Conference on Computation, Communication, Aesthetics & X*: 33-42, (36-37).
- [37] Jonas Eltes, “Lost in Computation (2017)”, Jonas Eltes’ website, accessed April 16, 2022, <https://jonaselt.es/projects/lost-in-computation>
- [38] Ken Feingold, “Works (2021)”, Ken Feingold’s website, accessed April 16, 2022, <https://www.kenfeingold.com>
- [39] Ross Goodwin, “Sunspring (2016)”, YouTube website, accessed April 16, 2022, <https://youtu.be/LY7x2Ihqjmc>
- [40] Dejan Grba, “Avoid Setup: Insights and Implications of Generative Cinema,” *Leonardo*, Vol. 50, No. 4, (2017): 384-393.
- [41] TEDx Talks, “Five dollars can save the planet (2018)”, TEDx Talks YouTube channel, accessed April 16, 2022, <https://youtu.be/8QUq8JTvoNM>
- [42] Rothco, “JFK Unsilenced (2018)”, Rothco agency’s website, accessed April 16, 2022, <https://rothco.ie/work/jfk-unsilenced>
- [43] Martin J. Sherwin, *Gambling with Armageddon: Nuclear Roulette from Hiroshima to the Cuban Missile Crisis* (New York: Knopf Doubleday Publishing Group, 2020), 15-16, 369-380.
- [44] Mario Klingemann, “Work (2021)”, Mario Klingemann’s website, accessed April 16, 2022, <https://underdestruction.com/category/work>

- [45] Libby Heaney, “Artworks (2021)”, Libby Heaney’s website, accessed April 16, 2022, <http://libbyheaney.co.uk/art-works>
- [46] Sven König, “sCrAmBlEd?HaCkZ! (2006)”, YouTube, accessed April 16, 2022, <https://youtu.be/eRlhKaxcKpA>
- [47] Jennifer Gradecki and Derek Curry, “Crowd-Sourced Intelligence Agency: Prototyping Counterveillance,” *Big Data & Society*, January-June, (2017): 1-7. doi.org/10.1177/2053951717693259
- [48] RyBN, “Human Computers (2021)”, RyBN’s website, accessed April 16, 2022, http://rybn.org/human_computers
- [49] Jeff Thompson, “Human Computers (2020)”, Jeff Thompson’s website, accessed April 16, 2022, <https://www.jeffreythompson.org/human-computers.php>
- [50] Żylińska, *AI Art*, 117-120.
- [51] Gene Kogan, “Machine Learning and Art”, (Panel 1: The Neural Aesthetic, SCM, City University of Hong Kong, 2019). *Art Machines ISMA*, https://youtu.be/4J9i_AyS-gl
- [52] Gene Kogan, “Artist in the Cloud: Towards the Summit of AI, Art, and Autonomy (2019)”, Medium website, accessed April 16, 2022, <https://medium.com/@genekogan/artist-in-the-cloud-8384824a75c7>
- [53] Mitchell, *Artificial Intelligence*, 200-214.
- [54] Marcus and Davis, *Rebooting AI*, 160-191.
- [55] Pasquinelli, *How a Machine Learns and Fails*.
- [56] Deborah G. Johnson, “Computer Systems: Moral Entities but Not Moral Agents,” *Ethics and Information Technology*, 8, (2006): 197.
- [57] Aaron Hertzmann, “Computers Do Not Make Art, People Do,” *Communications of the ACM*, 63, 5, (2020): 45-48.
- [58] Geoffrey Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (Anchor Books/Random House, Inc., 2001), 274-307, and passim.
- [59] Grant D. Taylor, *When the Machine Made Art: The Troubled History of Computer Art* (New York: Bloomsbury Press, 2014).
- [60] Żylińska, *AI Art*, 75-85.
- [61] Michel Frizot, “Light Machines: On the Threshold of Invention,” in *A New History of Photography*, ed. Michel Frizot, Pierre Albert and Colin Harding (New York: Könemann, 1998), 15-22.
- [62] Dejan Grba, “Alpha Version, Delta Signature: Cognitive Aspects of Artefactual Creativity,” *Journal of Science and Technology of the Arts*, Vol. 12, No. 3, (2020): 63-83 (75-77).
- [63] Grba, *Deep Else*, 19-22.
- [64] Tom White, “Perception Engines 2018 (2018)” and “Perception Engines 2021 (2021)”, Tom White’s website, accessed April 16, 2022, <https://drib.net>
- [65] Ben Bogart, “The Zombie Formalist: An Art Generator that Learns,” (SCM, City University of Hong Kong, 2021). *Art Machines 2: International Symposium on Machine Learning and Art Proceedings*: 165-166.
- [66] Grba, “Deep Else,” 20-21.
- [67] Grba, “Brittle Opacity,” 252-254.
- [68] Grba, “Alpha Version, Delta Signature,” 74-75.
- [69] Natalia Fuchs, Peter Kirn, Chris Salter, Emilio Vavarella, and Moises Horta Valenzuela, “AI Art Manifesto,” (2020). *Futurological Congress x Transart*.
- [70] Marc Böhlen, “AI Has a Rocket Problem (2020)”, *Medium*, August 3, accessed April 16, 2022, <https://medium.com/swlh/ai-has-a-rocket-problem-6949c6ed51e8>
- [71] Zeilinger, *Tactical Entanglements*, 135.
- [72] Andreas Reckwitz, *The Invention of Creativity: Modern Society and the Culture of the New* (Cambridge: Polity Press, 2017), 324-333.
- [73] Grba, “Alpha Version, Delta Signature,” 77-78.
- [74] Pierre-André Boutang, *Gilles Deleuze from A to Z*, directed by Pierre-André Boutang (2011, Studio Semiotext(e)), DVD.
- [75] Grba, “Brittle Opacity,” 255.
- [76] Victoria/ACM SIGGRAPH. “SPARKS: Creative Coding: Generative/Algorithmic Art and the Exploration of Authorship and Authenticity (2021)”, SPARKS Event announcement at ACM SIGGRAPH 2021 Digital Arts Community website, accessed April 16, 2022, <https://dac.siggraph.org/creative-coding>
- [77] Gary Hall, *Pirate Philosophy: For a Digital Posthumanities* (Cambridge: MIT Press, 2016), 93.
- [78] Dan McQuillan, “Manifesto on Algorithmic Humanitarianism,” in *Reimagining Digital Humanitarianism* (London: Goldsmiths, University of London, 2018).
- [79] Dominic McIver Lopes, *Being for Beauty: Aesthetic Agency and Value* (New York: Oxford University Press, 2018).
- [80] Grba, “Immaterial Desires,” 75-76.