A Study on the Aesthetic Challenges and Innovative Pathways of Artificial Intelligence Art

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Abstract. This article examines how contemporary AI systems—especially diffusion-based generators trained on large image and text corpora—are reshaping authorship, originality, and aesthetic judgment in artistic practice. Rather than treating AI as an autonomous "creator," we analyze two sites where human agency remains decisive: the provenance of training data and the human-in-the-loop stages of prompting, iterative selection, and post-editing. These mechanisms explain why AI outputs blur, but do not erase, the line between maker and tool. We argue that questions of creativity and credit arise not from machine "subjectivity," but from distributed decision-making across datasets, model priors, and curatorial choices. Building on this view, the paper proposes a working notion of co-authorship: authorship accrues to those who shape objectives, constrain the generative space, and accept accountability for publication and display. This stance also reframes aesthetic value: judgments of beauty or significance depend on how models are steered, contextualized, and read by audiences, not only on algorithmic novelty. The conclusion outlines a practical human–AI collaboration paradigm—instrumental rather than agentive—that preserves intention, emotion, and imagination while using AI to extend repertoires of form and process. We delineate the scope and limits of this approach and indicate where empirical evaluation would be most informative.

Keywords: AI art, artificial intelligence aesthetics, artistic subjectivity

1. Introduction

The recent consolidation of artificial intelligence in creative workflows has turned "AI art" from a technical curiosity into a sustained topic in art discourse. A widely cited inflection point was the 2018 sale of *Portrait of Edmond de Belamy* at Christie's for $432,500. Produced by the Obvious collective with a GAN trained on roughly 15,000 portraits from the fourteenth to twentieth centuries, the work signaled market appetite and clarified the mechanisms by which datasets, model architectures, and curatorial choices shape aesthetic outcomes. The episode foregrounded questions that are older than the technology itself: authorship, originality, and how value is conferred.

Traditional aesthetic paradigms typically presuppose human agency at the center of artistic production. Walter Benjamin's account of the artwork's "aura"—its singular, non-reproducible presence—offers one diagnosis of why mechanical replication unsettles value. Contemporary generators complicate the issue further because they can produce series of near-instant, stylistically coherent images. Yet what is at stake is not machine "subjectivity" per se, but how human intention

is distributed across prompt design, iterative selection, post-editing, and the institutional contexts of display.

Arthur Danto's thesis in *What Art Is* reframes this terrain: the essence of art lies in the presentation of meaning, not in material traits alone. On this view, interpretation mediates the passage from ordinary object to artwork, which is why Warhol's *Brillo Box* counts as art while a warehouse carton does not. The same logic bears on AI outputs. Whether such works satisfy our core understanding of art depends less on an algorithm's capacity to imitate style and more on how authorship, accountability, and context establish meaning.

This paper proceeds from two questions. First, has AI art already subverted the definition of traditional art, or does it instead pressure us to refine operational criteria for originality and credit? Second, how might technological advancement be reconciled with humanistic values in practice? To address these, we analyze the loci of human agency in AI pipelines and propose a co-authorship framework that preserves intention and responsibility while acknowledging the generative reach of contemporary models.

2. Aesthetic challenges of artificial intelligence art

2.1. The dilemma of originality and the questioning of creativity

One of the core controversies surrounding AI-generated art lies in the issue of originality. A report from Oxford University, *The Unreplaceable Power of Human Cognition: Theoretical Drivers Behind Irreproducibility by AI*, notes that AI's learning model is heavily dependent on the accumulation of historical data, and the outputs it generates are essentially recombinations of past information [1]. In the domain of artistic creation, studies have similarly pointed out that AI generates works through massive data training and algorithmic fitting, often mimicking the styles of human artists. This "algorithm dependence" makes it difficult for AI-generated works to escape reliance on human creativity, raising questions about their originality.

For example, the *Portrait of Edmond de Belamy*, generated by a GAN in 2018, was sold at Christie's for $432,500, marking AI art's official entry into the market. However, the essence of the work was the result of training on portrait datasets spanning the 14th to 20th centuries, leading to doubts about its originality. As Benjamin stated in *The Work of Art in the Age of Mechanical Reproduction*, technological replication weakens the "aura" of an artwork [2]; the mechanized nature of AI art generation only exacerbates this issue.

Moreover, there exists a pronounced divergence between public acceptance of "robot painters" and the commercial direction of the art market. On one hand, the market shows great enthusiasm for AI works—such pieces are increasingly disseminated and traded, and more people are willing to pay high prices for them. On the other hand, most individuals remain skeptical about attributing artistic subjectivity to AI. Though AI-generated visuals may impress and satisfy viewers, they are often seen as fundamentally different from traditional artworks—lacking the intuition, emotion, and individual expression of human artists, and thus difficult to accept as genuine art.

2.2. The crisis of artistic subjectivity

Margaret Boden argues that creativity is constitutive of art. Current generative systems [3], however, do not exhibit intrinsic motivation or self-directed goals; they operate by optimizing outputs against objectives set by people and by patterns internalized from human-curated datasets. In this sense, intention is not located in the model but distributed across the pipeline: data selection and labeling, prompt design, iterative sampling and acceptance, post-editing, and the institutional contexts that frame display and reception. The model contributes generative reach, but authorship remains

anchored in those who specify aims, constrain the search space, and assume responsibility for publication.

Style imitation by AI further clarifies this distribution. Even when a system reproduces a recognizable idiom, the semantic force of the work depends on how human agents contextualize it— what problem is posed, which variants are retained, and what claims are made for the piece. The pertinent question, then, is not whether AI possesses "creative power" in a human sense, but how practices should register, disclose, and evaluate human decision points.

Accordingly, evaluation criteria cannot rely solely on artist identity. Alongside traditional judgments of form and meaning, assessments can incorporate: (i) accountability and disclosure (data provenance, constraints, and editing steps), (ii) reproducibility of the pipeline where appropriate, and (iii) limited forms of algorithmic explainability that clarify how steering shaped outcomes. These criteria do not confer subjectivity on the model; rather, they make visible the human agency that structures AI-assisted creation [4].

2.3. Ethical and socio-cultural disruptions

Debates over AI art extend beyond definitions of art to concrete ethical and socio-cultural stakes. Copyright is the most immediate: under current U.S. registration guidance, works whose traditional elements of authorship are produced by a machine are not registrable, whereas AI-assisted works may qualify if a human contribution is identified and limited to the human-authored portions. This position was articulated in a March 2023 policy statement and reinforced in case-specific decisions such as Zarya of the Dawn [5]. These moves clarify why disclosure of human inputs (e.g., selection, editing, arrangement) matters for attribution and why artist identity alone cannot settle the question of authorship.

Concerns about cultural homogenization arise from how models are trained and steered. When systems learn from large, overlapping corpora, outputs can converge on recurring palettes, compositions, or motifs, especially under default prompting and sampling. The risk is not that variety is impossible, but that convenience and platform norms pull creators toward similar styles unless datasets, prompts, and curation are deliberately diversified. Recent studies and commentary warn that generative systems can nudge expression toward prevailing norms, with potential costs to cultural plurality [6].

A practical response is to shift evaluation from abstract claims about machine "creativity" to auditable practices. Alongside conventional judgments of form and meaning, reviewers and institutions can consider: (i) accountability and disclosure (training data provenance, constraints, post-editing steps), (ii) where feasible, reproducibility of the pipeline, and (iii) limited explainability sufficient to show how human steering shaped the result. This reframing does not assign subjectivity to the model; it makes legible the human choices that structure AI-assisted creation while addressing labor valuation and cultural diversity in concrete terms.

3. Innovative pathways of AI art

Debates about AI art often turn on whether creative subjectivity is a necessary condition for artistic status. Traditional accounts place intention, motivation, and accountability in a human author; current systems, by contrast, optimize against goals and data constraints set by people. This mismatch has led many to treat AI outputs as instrumentally produced rather than authored. The view is not groundless: contemporary models still depend on externally specified objectives and human-curated corpora.

At the same time, technical and procedural changes complicate a strict tool/author divide. Some scholars argue that adaptive pipelines—systems that incorporate feedback and adjust sampling or

selection strategies over time—pressure the assumption that only humans can shape style or influence meaning. Galanter, for example, raises the possibility that learning from audience response and evolving strategies may support a limited notion of "weak subjectivity," provided that the criteria are clearly stated and empirically assessed [7]. Our stance in this paper is pragmatic: rather than granting person-like agency to models, we examine how new workflows extend authorship across people, datasets, and model components. Under this framing, AI is neither a neutral instrument nor an autonomous artist; it is a locus where human aims are operationalized and amplified. The innovative pathway, therefore, lies less in declaring a new artistic ontology than in specifying co-authorship practices, disclosure norms, and evaluation rubrics that accommodate adaptive, data-driven creation while keeping intention and responsibility visible.

3.1. Technological breakthroughs

Core advances underpinning AI art—such as Generative Adversarial Networks (GANs) and style-transfer methods—do more than add visual effects; they alter how originality and authorship are perceived. Since 2014, GANs have enabled the synthesis of images that exhibit coherent structure without a hand-crafted template [8]. Portrait of Edmond de Belamy positioned this capacity in a market and exhibition context: a GAN trained on a corpus of historical portraits generated a work legible within classical idioms while not being attributable to a single prior artist. Style transfer offers a complementary mechanism, re-weighting content and style statistics so that images inherit formal qualities associated with particular schools or periods; projects like Google's DeepDream showed how network activations can be surfaced as hallucinatory patterns that audiences read as "dreamlike" [9].

These techniques, however, do not relocate intention into the model. They expand generative reach while leaving decisive choices—objective setting, data delimitation, prompt design, variant retention, and post-editing—in human hands. Claims that such pipelines evidence "subjectivity" are strongest when the system: (i) updates its behavior in response to external feedback under stable rules, (ii) documents how those updates change outputs, and (iii) is situated within a curatorial frame that makes the steering legible. Interactive work sharpens the point. Pieces like Mario Klingemann's Neural Glitch route audience inputs into real-time transformations, dispersing creative influence across viewers, code, and the exhibiting institution [10]. Rather than dissolving authorship, such configurations call for revised evaluation: disclosure of interaction logic, logging of decision points, and criteria that separate algorithmic novelty from curatorial and participatory choices. Under these conditions, "innovation" is measured not only by what the model can render, but by how transparently human agents shape and account for the result.

3.2. Innovation in creative models

The acceleration of AI art has catalyzed human–machine co-creation models that reconfigure authorship from a single-author paradigm to networked collaboration. In these settings, artists do not cede intention to the model; rather, they distribute it across stages of goal setting, data delimitation, prompt and parameter design, iterative selection, and post-editing. The practical consequence is a shift from closed, solitary workflows to open, negotiated ones in which AI functions as a partner that expands the search space of form and process. Mazzone and Elgammal describe this role as a "creative catalyst": AI not only surfaces unforeseen visual candidates but can also reorganize an artist's exploratory trajectory by offering alternatives that would be costly to reach by hand [11].

Refik Anadol's *Machine Hallucinations* illustrates such co-creation. The project integrates large-scale datasets with architectures including DCGAN, PGAN, and StyleGAN; yet the machine's contribution is framed by the artist's curatorial constraints—what collections are ingested, how

outputs are filtered, and how the final installation is staged. The result is not a displacement of artistic subjectivity but its extension: the artist retains directional control while mobilizing computation to probe perceptual strata that exceed unaided attention.

A second development is distributed authorship. Open-source models, shared weights, and community datasets enable geographically dispersed contributors to co-produce pipelines—training, fine-tuning, and remixing systems that no single studio could maintain. AI painting communities exemplify this pattern, where versioned checkpoints and public prompts make the lineage of a work traceable. As Brynjolfsson and McAfee argue, such arrangements can increase diversity and complexity by pooling heterogeneous expertise while fostering cross-cultural exchange [12]. These models challenge the figure of the solitary creator not through rhetoric but through practice: authorship becomes a record of who shaped objectives, curated material, steered generation, and took responsibility for public presentation.

3.3. Reconstructing aesthetic theory and artistic evaluation systems

As AI systems become routine components of creative workflows, long-standing assumptions in aesthetics require revision at the level of mechanisms rather than slogans. Traditional theories often embed a single, human author whose emotions and intentions anchor meaning. By contrast, contemporary pipelines distribute intention across goal setting, data curation, model steering, and post-production, while audiences and institutions shape reception. In this sense, "distributed subjectivity"—a post-humanist motif—describes how agency is arrayed among people, datasets, code, and exhibiting contexts without attributing person-like interiority to machines [13].

This redistribution does not abolish authorship; it reframes where it is located and how it is evidenced. In AI-assisted practice, algorithmic training and data inputs are indispensable, yet the decisive choices remain human: which collections are admissible, how constraints are set, which variants are retained, and what claims are made for a work. Audiences also matter; interaction logs, curatorial notes, and display decisions mediate how images are read. The subject of art, then, is better modeled as a dynamic network of contributions and accountabilities rather than a solitary origin.

Evaluation frameworks should adjust accordingly. Purely formal metrics or purely introspective judgments are each incomplete. We propose a hybrid rubric that couples cognitive with experiential dimensions. On the cognitive side: (i) disclosure and provenance (training data, constraints, and editing steps), (ii) limited reproducibility of the pipeline where appropriate, and (iii) computational features that make steering legible (e.g., parameter ranges, selection criteria). On the experiential side: (iv) audience response measured through documented protocols (surveys, interviews, interaction traces), and (v) contextual interpretation (curatorial framing, cultural references). The aim is not to grant "subjectivity" to models but to render human intention and responsibility visible while acknowledging how AI expands the repertoire of forms. Such a system promotes plural standards without collapsing into relativism: the quality of AI-art hinges on how transparently contributors shape outcomes and how convincingly works solicit understanding and response.

4. Future prospects and reflections

Looking ahead, the development of AI-generated art will continue to be shaped by tension—and possible complementarity—between technical ambition and humanistic commitments. On the technical side, two trajectories are salient. First, multimodal integration is consolidating pipelines that jointly reason over text, image, audio, 3D, and motion. Such systems enlarge the space of feasible forms, but they also increase the number of human decision points (data governance, safety filtering, and curatorial framing) that must be disclosed for works to be interpretable. Second, quantum-inspired computing is frequently cited as a future accelerator [14]. It is prudent, however, to separate

speculation from mechanism: an n-qubit register spans 2^n computational basis states (e.g., 30 qubits $\approx 10^9$, not 10^{30}) [15], and there is no settled basis for fixed "orders-of-magnitude" speedup claims for artistic generation in general. Quantum random number sources can inject hardware-level unpredictability, but physical randomness alone does not confer intention or authorship; it enlarges the range of candidates that human agents must still select, edit, and contextualize.

Concept pieces sometimes dramatize these ideas—for example, works that route a fraction of narrative branching through quantum noise. The interpretive stake, however, is human: what constraints are set, how outcomes are logged, and why the stochastic element matters for meaning. If such configurations pivot attention toward parameters and processes at the expense of content, they risk instrumentalism. The curatorial problem, then, is to keep technique accountable to purpose: make steering legible, but ensure that formal experimentation serves intelligible claims about the world, memory, or feeling.

On the normative side, questions about what art is for will likely eclipse attempts to redescribe its essence. As machine-assisted works become perceptually indistinguishable from human-made ones, practical criteria—how art shapes attention and cognition, how it fosters remembrance or critique, how it patterns social imagination—will guide evaluation. Policy frameworks that emphasize transparency, human oversight, and the mitigation of cultural homogenization can supply useful guardrails for the art world, provided they are adapted to exhibition, publication, and commissioning practices rather than copied wholesale from software governance.

A future-oriented, symbiotic model of "technology and humanity" therefore rests on concrete practices: (i) disclose goals, datasets, steering, and post-editing; (ii) document interaction logs and curatorial choices; (iii) separate algorithmic novelty from artistic claim; (iv) include audience-facing rationale explaining why a given technique matters for meaning. Under these conditions, AI can extend repertoires without displacing the human responsibility to make, to interpret, and to care [16].

5. Conclusion

As AI-generated art challenges traditional aesthetics, it provokes reflection on artistic subjectivity and originality. Throughout its evolution, AI art presents a set of aesthetic challenges centered on the blurring of artistic subjectivity, the shift in creative modes driven by technological empowerment, and the conflict between human emotion and instrumental rationality. At the same time, it opens new possibilities: AI can be more than just a creative tool—it also has the potential to participate in artistic thinking, aesthetic construction, and even philosophical reflection, encouraging humanity to reconsider the fundamental question of "what is art." In today's historical context, faced with the dual nature of AI-generated art—as both a challenger and a co-creator—artistic practice should transcend the binary opposition of human versus machine, and instead explore a new paradigm of human–machine collaborative creativity. Moreover, in an era marked by rapid technological advancement, a genuine response to the aesthetic propositions posed by AI-generated art requires sustained critical reflection and interdisciplinary dialogue. Only through such efforts can a path of innovation be forged amid these emerging challenges.

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