

Irreplaceability of Human Beings in the Age of Artificial Intelligence: Empathy and Embodied Aesthetics in Musical Performance

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Abstract

The rapid development of artificial intelligence has reshaped the boundaries of artistic creation. As AI algorithms increasingly demonstrate the capacity to simulate composition, painting, and even literary creativity, the “irreplaceability of human beings” in artistic practices has emerged as a central issue in contemporary aesthetics and the philosophy of technology. Focusing on musical performance as a core case study, this article investigates the unique value that performing arts continue to hold in the age of AI. It argues that the aesthetic significance of musical performance lies not in the produced artistic outcome but in the embodied, situational, and relational processes through which performers and audiences co-create affective resonance and social connectedness. By examining the semiotic mechanisms of AI-generated art, theories of autopoiesis, and the dynamics of human emotional intimacy, the study demonstrates that although AI can reproduce artistic forms, it cannot generate the life-oriented intentionality or empathic structures inherent in human expression. Drawing on findings from cognitive neuroscience—particularly mirror-neuron systems and emotional empathy mechanisms—the article further analyzes the psychological differences in audience perception when encountering artificial versus human performance. Consequently, it contends that the relationship between AI and performing arts should not be framed in terms of substitution or conflict but rather as a dynamic force driving the self-renewal of the artistic system. The delineation of this boundary constitutes not only a technological issue but also an aesthetic and ethical one.

Keywords

Artificial Intelligence, AI Art, Performing Arts, Philosophy of Artificial Intelligence.

1. Introduction

Debates over whether AI-generated artifacts qualify as “art” have been extensive and inconclusive. Prior to the advent of artificial intelligence, artistic creation was long defined as a uniquely human practical and spiritual activity.[1] In the early stage of AI-generated art, many scholars argued from various aesthetic perspectives why such outputs should not be considered genuine art.[2] In the current phase—characterized by the rapid acceleration of AI capabilities—numerous artists and cultural practitioners have begun expressing pessimism about the future of art, asserting that “AI will eventually replace human artists.”[3]

However, despite AI’s powerful learning and generative capacities in the domain of creation, its substitutive effects in the realm of artistic performance—especially musical performance—remain fundamentally limited. Even with the maturity of recording technologies, virtual idols, and AI-driven performance systems, audiences still overwhelmingly prefer live human performance to the purely algorithmic production of flawless sound. This phenomenon reveals a foundational dimension of human irreplaceability within the arts.

It is important to clarify that this article does not aim to defend the universality of the claim that “art belongs solely to humans,” nor to advocate for any specific aesthetic doctrine. Rather, it rests on a more modest premise: regardless of how advanced AI becomes, there will always be individuals who prefer performances delivered by living, embodied human artists. If we accept this premise, then identifying the distinctively human qualities that AI cannot replicate becomes key to understanding the divergence between AI and human performers. The performing arts are an ideal site for such inquiry: due to their inherently interpretive, real-time, and embodied nature, they make the essential differences between “human” and “machine” most visible.

Current scholarship has articulated the irreplaceability of human artists from multiple perspectives. For example, Duan Jifang draws on the Collected Works of Marx and Engels to argue that art is the “objectification of human essential powers.”[4] Chen Changshen, building on Gregory Currie’s theory of heuristic pathways, contends that authentic artistic creation necessarily involves the artist’s process of inspiration.[5] Wang Zhaoxing argues that if a dataset contains no “unexplored artistic languages,” AI cannot produce genuine innovation; thus AI lacks true creative ability, and its output ultimately remains an extension of human creation.[6]

Nevertheless, several unresolved issues remain. First, does rejecting AI art’s artistic status on philosophical or definitional grounds risk repeating the historical mistake of dismissing photography as non-art in its early days, thereby undermining the argument’s persuasiveness? Second, tools such as Suno, Midjourney, and iReal Pro already exhibit limited forms of innovation. Although the results are often judged “mediocre,” such tools have nonetheless begun replacing certain artistic labor.[7] Can this empirically observable displacement be denied? Third, even if AI lacks human “inspiration” and “creativity,” could it nonetheless generate equivalent artistic effects through its own computational logic? If so, how—and why—would such a process occur?

In response, this article uses musical performance as an analytical entry point to investigate the roots of human irreplaceability within artistic activity in the age of artificial intelligence. Drawing on theoretical inquiry and an interdisciplinary framework, the discussion unfolds along three dimensions:

The technological mechanisms and semiotic features of AI-generated art—analyzing the ontological logic of AI generation and clarifying the boundary between representation and creation.

The embodied and situated nature of the performing arts—demonstrating, through phenomenology and performance anthropology, the unique aesthetic significance of the living body in performance.

The cultural and affective mechanisms that AI cannot replicate—drawing on the human intimacy effect, autopoiesis theory, and empathy psychology to reveal the psychological and cultural foundations of artistic irreplaceability.

2. Why AI Art May Eventually Replace Artists’ Creation

2.1. The Fundamental Logic of AI Creation and the “Algorithmic Black Box”

To discuss AI art rigorously, one must first examine the underlying logic of AI-driven creation. When AI is employed as an artistic tool, its core mechanism does not replicate the cognitive or affective processes of human artists. Instead, it operates by transforming aesthetic characteristics of art into quantifiable numerical features through statistical learning (Ref. [8]). Specifically, the algorithm decomposes massive datasets of existing artworks, extracts measurable aesthetic elements—such as color saturation, melodic intervals, rhythmic patterns,

or tempo—and subsequently recombines these numerical features according to the trained model to produce new “artworks” (Ref. [9]).

For instance, music-generation models (e.g., Suno) translate the concept of “sad emotion” into concrete parameters such as minor key, 60–70 BPM tempo, and increased proportion of low-frequency instrumentation. Similarly, image-generation models (e.g., Midjourney) encode “Impressionist style” as quantifiable metrics including brush-stroke blur degree, number of color overlay layers, and light–shadow contrast ratios. Consequently, AI’s comprehension of artistic aesthetics remains confined to the level of statistical correlation among numerical features; it possesses no genuine understanding of why a minor key evokes sadness or why tritones and augmented/reduced intervals induce tension. The essence of AI creation is therefore a technical replication of surface aesthetic patterns rather than a comprehension of deeper artistic meaning. This limitation is precisely why many artists and critics insist that “AI cannot replace human artists.

However, the situation is considerably more nuanced due to the phenomenon known as the “algorithmic black box.” The term “algorithmic black box” refers to the opacity of the internal layers of an artificial intelligence system, such that the transformation from input to output is not fully observable or interpretable by external observers, resulting in a lack of transparency in the decision-making process (Ref. [10]). The existence of the algorithmic black box reveals two critical insights:

1. AI possesses its own distinct mode of cognition that differs fundamentally from human cognition and does not need to mirror it to achieve valid outcomes.
2. Although AI’s cognitive process, despite being alien to humans, can nonetheless produce outputs that are comprehensible, aesthetically pleasing, and acceptable to human audiences.

From this perspective, the absence of human-like emotion or cognition in AI does not constitute an insurmountable barrier to legitimate artistic creation. Just as humans need not understand the binary operations of a computer performs in order to trust the correctness of its arithmetic results, there is no a priori requirement that AI must possess human-like consciousness or affective capacity for its outputs to conform to recognized principles of artistic beauty. In other words, even if AI can never acquire human emotion or phenomenological understanding, this limitation does not preclude it from producing excellent artworks—precisely because we cannot fully trace, and therefore do not need to replicate, the path it takes to reach an aesthetically valid destination.

2.2. The Possibilities of AI Art Creation from a Semiotic Perspective

If the “algorithmic black box” reveals the incomprehensibility of AI creation, semiotics, by contrast, demonstrates the communicability of AI-generated works. Even though the internal mechanisms of AI remain a black box to humans, the artistic signs it produces can still integrate into the human system of meaning. From a semiotic standpoint, Wittgenstein proposed that “the limits of my language mean the limits of my world”, arguing that human cognition and expression of the world are both realized through linguistic signs [11]. Building on this, Langer’s symbolic aesthetics further posits that art is essentially a “symbolic form of human feeling”, serving as a carrier for conveying emotions through specific artistic signs [12]. These two theories provide a direction for artificial intelligence to acquire artistic creative capabilities: no matter how rich and complex human emotions are, human beings are constrained by the boundaries of linguistic expression. Large-scale artificial intelligence models, however, possess the ability to learn language, enabling them to master and utilize these signs for creative purposes. Since art itself is also a form of sign, AI does not need to comprehend the emotions or meanings behind these signs; instead, its process of acquiring artistic signs essentially involves establishing a mapping relationship between symbolic representations and numerical features. By analyzing the associative patterns between signs and emotional expressions in

human artworks, artificial intelligence systems can construct an associative network between symbolic features and parameterized models. In the creative process, the system first converts abstract instructions into specific symbolic labels, then activates the corresponding parameter combinations, and ultimately generates artistic outputs that conform to specific symbolic norms. This mechanism allows artificial intelligence to simulate the symbolic expression process of human artistic creation, achieving sign recombination that complies with aesthetic laws across diverse artistic domains such as music and painting.

The Turing Test, which marks the origin of contemporary philosophy of artificial intelligence, depicts a similar scenario. Proposed by Alan Turing, the father of computer science, in his paper *Computing Machinery and Intelligence* published in *Mind*, this test is a philosophical inquiry that posits that the sufficient condition for judging whether an artificial machine possesses human-like intelligence is to examine whether its verbal behavior can successfully simulate that of humans [13]. As a theory of mind characterized by behaviorism, it embodies the idea that people should focus on observable behavioral outcomes rather than internal mechanisms, a perspective shaped by the black-box effect. Extending this to the evaluation of AI art, we can hypothesize the following: if audiences—including art experts—cannot distinguish solely from the work itself whether its creator is a machine or a human, then in terms of sign utilization, the algorithmic system has already met the necessary conditions for "artistic behavioral capacity". Further deliberation from this angle reveals that the common scholarly argument that "AI lacks innovativeness" can actually be addressed through random transitions and recombinations within computer systems. Such randomness, however, must adhere to specific rules aligned with human aesthetics. By sampling probability distributions, novel combinations that deviate from the mean of the training dataset can be generated, and such statistical rarity is sufficient to meet the aesthetic standard of "originality".

It should be supplemented that while this paper holds that "AI art may replace the creative practice of artists", it rejects the notion that "AI art may replace artists themselves". The former viewpoint is derived from the insights of neo-behaviorist psychology, whereas the latter upholds a human-centered core, which will be further elaborated to demonstrate the uniqueness of human beings.

3. Essential Differences Between AI and Human Beings: Irreplaceable Biological and Socio-Cognitive Attributes

3.1. Empathy Theory: The Empathic Barrier Between AI and Humans

Although the "algorithmic black box" weakens humanity's traditional advantage in unique artistic creativity, it simultaneously increases the cognitive cost of understanding AI, thereby producing a persistent "empathic barrier" between humans and machines. Empathy, in its simplest definition, refers to the psychological capacity to recognize others' emotions and affective states and to respond in certain appropriate ways. The most widely accepted model in psychology—the dual-process developmental model—proposes that empathy comprises emotional empathy and cognitive empathy. Emotional empathy is innate and follows a U-shaped developmental trajectory, whereas cognitive empathy emerges later and generally exhibits an inverted U-shaped pattern.[14]

Although artificial empathy has begun to appear in recent years, it is largely limited to the simulation of cognitive empathy, dependent entirely on learning from training data. This is because humans themselves cannot transmit their innate emotional empathy to AI systems.[15] Conversely, the same "black box" prevents humans from empathizing with AI: humans can neither experience emotional empathy toward AI nor easily develop cognitive empathy toward it. Even when such empathy appears to exist, it is often a projection grounded in anthropomorphism rather than genuine understanding.

A revealing example from outside the arts comes from strategic games. AI has already surpassed humans in this domain. AlphaGo, through deep learning, mastered the extraordinarily complex decision space of Go and defeated world champion Ke Jie, demonstrating AI's superior computational performance. Yet this technological "supremacy" produced two intriguing outcomes: first, public attention did not shift toward AlphaGo; instead, Ke Jie's cultural influence and public admiration increased markedly. Second, people's passion for Go did not turn toward observing "AI vs. AI" matches but remained centered on "human vs. human" competition.

This reflects precisely the phenomenon of non-empathizability: humans cannot imaginatively inhabit the experiential world of AI, nor can they "admire" it in the same way they admire humans. As long as the object of attention is another human being, empathy—and therefore admiration—remains possible. This pattern existed even before the emergence of AI: vehicles were faster than humans, recording devices often outperformed bar singers, yet people continued to admire fast runners and emotionally expressive live performers.

Such phenomena reveal a crucial fact: human attention to human activity derives not only from "technical skill" but from the emotional bond and value recognition one forms toward another human. From this standpoint, humans evidently cannot experience full empathy toward AI. In Go competitions, spectators watching Ke Jie are drawn to his decision struggles, emotional regulation, resilience, and personal presence—expressions of human life that cannot be algorithmically reproduced. Even if AI completely surpasses humankind in technical terms, the object of emotional resonance and value identification for humans remains other humans.

This aligns with the humanistic psychology of Maslow: "The meaning of human action lies not in its external result but in the process of self-actualization." [16] The same logic applies to the arts. The audience's interest in performance does not stem from a pursuit of technically perfect artistic forms but from the expectation of encountering human beings transmitting lived experience through art. Even if AI can produce works with superior technical parameters, it cannot replace the human capacity to convey life experience and emotional presence in performance. This difference constitutes the fundamental divide between AI and humans in terms of cognitive value and existential significance within the artistic domain.

3.2. Autopoiesis Theory: The "Intrinsic Purpose" of Living Systems and the Fundamental Limits of AI

Another essential distinction between AI and humans lies in the fact that AI is an inorganic, non-living entity. From the perspective of autopoiesis theory in life sciences, the fundamental difference between AI and human beings concerns whether a system possesses the intrinsic purposiveness characteristic of living organisms. Autopoiesis theory posits that life—whether a single-celled organism or a complex human being—derives its essence from an internally sustained mechanism of self-production. This mechanism constitutes the necessary and sufficient condition for transforming material systems into living systems and manifests concretely in metabolic processes: through continuous exchange of matter and energy with the environment, an organism maintains self-generation and self-preservation, thereby sustaining systemic identity in the face of environmental uncertainty. [17] This self-organizing process entails two core attributes—intrinsic purpose and normativity—which together define the essence of living systems and remain irreproducible by non-living systems.

With respect to intrinsic purposiveness, all activities of a living organism are oriented toward the ultimate goals of survival and continuation. These goals are not externally imposed but emerge spontaneously as inherent properties of the system. Human beings, as advanced living systems, engage in artistic creation not merely for biological survival but as a spiritual extension of this intrinsic purposiveness—art serves as a medium for self-understanding, emotional expression, and social connection. In essence, artistic practice represents a form of

spiritual self-maintenance undertaken by a living system. By contrast, AI, as a non-living system, depends entirely on external energy supply and human-defined instructions. It lacks the capacity for self-generated goals. Its so-called “creative acts” are merely technical responses to externally assigned tasks, devoid of the experiential grounding or existential drive that characterizes human creativity; thus, AI cannot generate meaning-motivated artistic intentions. In terms of normativity, the activities of living systems are always accompanied by value-oriented judgments—specifically, whether a given action supports the organism’s survival and continuity. Such judgments form an internal normative structure. In human artistic creation, this normativity manifests as aesthetic autonomy: artists, through reflection upon and transformation of their lived experience, formulate independent conceptions of beauty and meaning. Their artistic practices thereby express particular emotional orientations and value positions, endowing artworks with spiritual depth. In contrast, AI operates through data-driven probabilistic decision-making. Its judgments about “artistic appropriateness” are, in essence, statistical reproductions of human aesthetic data. Without value reflection grounded in lived experience or emotionally charged perspectives, AI cannot develop authentic aesthetic normativity. This lack of normativity confines AI-generated art to a purely technical plane and prevents it from attaining the existential and spiritual depth characteristic of human artistic creation.

In other words, AI does not possess a life-directed will that seeks benefit and avoids harm, nor does it have innate desires or motivations. As a result, it cannot make value-based decisions in the manner of human intelligence, let alone engage in autonomous choices guided by moral or ideal considerations. Because it lacks intrinsic interests, AI cannot claim the status of a moral or rights-bearing subject. Moreover, AI has no bodily experience or life consciousness linked to organic organisms, and thus cannot experience the physiological or psychological pain associated with moral blame or legal punishment. Put differently, AI has neither life-will nor desire; its operation is governed purely by logic and algorithmic computation. It lacks the non-rational dimensions—emotion, affect, passion, imagination, intuition—that are indispensable to human intelligence. These non-rational factors fundamentally transcend the limits of rational calculation and cannot be acquired by AI in the absence of biological life instincts.[18]

3.3. Intergroup Threat Theory: The Dilemma in the Social Acceptance of AI

A final and crucial distinction between AI and humans lies in the fact that they are not conspecific beings. As Marx observed in the *Economic and Philosophic Manuscripts of 1844*: “Man is a species-being, not only because he treats himself and other things—both his own species and other species—as objects in practice and theory, but also because he treats himself as the existing, living species, as a universal and therefore free being” [19]. This formulation highlights the core attribute of “species-being”: humans do not merely belong to a biological taxon; on spiritual and social dimensions, they consciously regard themselves as part of the integral whole of “humanity.” All human creative activities—whether labor, science, or art—constitute processes through which individuals affirm their own humanity through practice.

Even if AI were to overcome limitations of biological life in the future and acquire some form of genuine “autopoiesis” or self-origination, it would still struggle to fully replace humans in the performing arts. This phenomenon can be explained by Intergroup Threat Theory [20], which posits that the emergence of an outgroup generates two primary threats to the ingroup: (1) realistic threats concerning material resources and physical security, and (2) symbolic threats to collective identity and the distinctiveness of ingroup values. In the domain of art, AI poses precisely the latter type of threat: if AI were to supplant humans as performing artists, humanity would lose a vital channel through which individuals express the self, affirm identity, and sustain the uniqueness of human value, thereby weakening cultural identity and self-worth.

This symbolic threat, in turn, creates a profound barrier to human acceptance of AI. A parallel can be observed in the public response to AlphaGo's victory over human Go champion Ke Jie: despite the machine's objective superiority, public admiration and emotional projection remained overwhelmingly directed toward Ke Jie, because people prefer to attribute spiritual qualities such as "will, passion, and resilience" to fellow members of their own species rather than to an emotionless machine.

From the perspective of identity formation, humans establish relations between self and society through artistic activity, thereby constructing culturally situated self-understanding. As a living carrier of human culture, the performing arts fulfill essential functions in the creation and transmission process: preserving cultural memory, shaping collective identity, and strengthening social cohesion. Human emotional identification with performing artists is, in essence, identification with the cultural identity borne by a conspecific being—an identification that depends on shared lived experience and cultural context. AI, as an outgroup entity, lacks the shared cultural experience and historical memory of humankind. Consequently, even if it can formally replicate artistic creation, it cannot carry the cultural symbolism and identity value inherent in human art. AI is therefore incapable of fully substituting for humans in the artistic domain; its works will ultimately lack the social recognition and spiritual resonance that are unique to human artistic creation.

4. The Impact of Irreplaceability in Musical Performance Art

4.1. Musical Performance: The "Possibility of Replacement" and the "Reality of Irreplaceability"

When artistic practices are classified by their mode of creation, the fundamental distinction between performing arts and other art forms lies in the fact that non-performing artworks are already fixed when exhibited; what the audience encounters is the artist's once-completed product. Conversely, performing arts generate meaning in situ: their aesthetic value depends on the performer's real-time artistic re-creation and expressive immediacy—what is often termed secondary creation. Among performing arts, musical performance possesses a further peculiarity: the performer works from a fully predetermined score, rendering the musical form relatively fixed and suggesting, at first glance, that the musician functions primarily as a reproducer. By contrast, film and theatrical acting are grounded in comparatively open script structures that allow greater space for improvisation, emotional fluctuation, and actor-initiated additions; actors are almost always required to innovate. From this perspective, musical performers would seem more easily replaced by AI, since the representational aspect of music performance appears technically reconstructable through computational means. Yet the historical and contemporary reality contradicts this assumption.

Across the history of music, technological "replaceability" has always coexisted with aesthetic "irreplaceability." Long before the emergence of AI, human societies experienced multiple waves of technological substitution—from phonographs and records to magnetic tape, CDs, digital audio, and streaming platforms. Each new sound reproduction technology was once thought to herald the decline of live performance. However, over more than a century, musical performers have not been displaced; instead, the value of liveness has only increased. Even today, when studio recording technology is at its peak, audiences willingly pay high prices for concerts whose acoustic quality often falls short of recorded productions. Likewise, although digital platforms allow listeners to access the world's finest singers at any moment, live performances by amateur musicians continue to thrive in bars, on streets, and at music festivals, consistently drawing enthusiastic audiences.

This phenomenon demonstrates that the value of musical performance does not lie solely in "sound quality" or "technical perfection," but in whether the source of the sound is a real, living

human being. In other words, the meaning of musical performance is grounded not in its “audibility,” but in its “perceptibility”: people are listening not only to sound, but to a person producing sound.

This insight is supported by psychological research. Emma Rodero and Ignacio Lucas, in their comparative study of synthetic and human voices, identified what they term the Human Emotional Intimacy Effect.[21] They found that human voices elicit stronger feelings of closeness and social connectedness, generating more positive emotional responses. Synthetic voices, by contrast, significantly diminish this sense of emotional intimacy. Thus, when perceiving sound, humans do more than process acoustic information—they subconsciously detect the presence of another person.

Therefore, the implicit “bias” humans display toward human-generated sound—including AI-generated music—is not merely a matter of cultural conservatism or aesthetic habit. Rather, it arises from deeper psychological and physiological mechanisms: humans are predisposed to experience empathy and trust toward intentional beings. This preference can be explained from several perspectives:

4.1.1. The role of the mirror-neuron system

The mirror-neuron system plays a critical role in encoding others’ action sequences and generating corresponding self-action representations. It facilitates embodied simulation and empathic communication.[22] Because mirror neurons activate in response to observing another being’s actions, humans unconsciously recognize the observed subject as an intentional life-form.[23] Thus, for an audience, a human musical performer naturally triggers these embodied responses. In contrast, although AI-generated performance can mimic bodily movements with mechanical precision, such movements lack the emotional intentionality necessary to activate mirror-neuron-based embodied resonance.

4.1.2. Trust derived from authenticity

Human aesthetic experience includes a natural preference for authenticity. As Walter Benjamin argued in *The Work of Art in the Age of Mechanical Reproduction*, mechanical copies may be infinitely reproducible, yet they lose the “aura” rooted in the unique presence of the original.[24] The significance of “liveness” in musical performance derives precisely from its being created in real time under the gaze of an audience. AI performances—no matter how technically flawless—lack this irreproducible presence, and thus fail to evoke genuine aesthetic trust.

4.1.3. Resonance of emotional intentionality

Musical performance conveys not only emotion but also the intentionality behind emotion. Mental imagery refers to the listener’s ability to construct internal representations in the absence of external stimuli.[25] When listening to a human singer, the audience perceives not merely a “sad melody,” but a person expressing sadness. This perception of the expresser’s presence forms the basis of human empathy. AI can learn to generate melodies labeled as “sad style,” but it lacks the motivation to express sadness. For the audience, AI-generated performance produces not emotional flow but an emotional template—hence failing to elicit genuine resonance.

4.2. The Continuity of Musical Aesthetics from the Perspective of Human Irreplaceability

The fact that AI cannot replace live performers does not merely indicate that humans still retain a technical advantage; rather, it reveals a deeper cultural-structural truth: the essence of artistic activity has never been simply the “production of works,” but has always been a “symbolic practice that sustains the human community.” The irreplaceability of musical performance is precisely the embodiment of this symbolic and communal dimension. It

concerns not only “whether humans can be imitated,” but more fundamentally “why humans perform.”

First, from the perspective of cultural sociology, musical performance constitutes a social ritual rather than a purely artistic event. As Émile Durkheim argued, rituals are mechanisms for the self-reproduction of society: through collective participation, empathy, and resonance, individuals affirm their group belonging at the sensory level [26]. Musical performance is one of the most characteristic “secular rituals” in modern society. Whether in the collective shouting at a rock concert or the shared silence of a classical recital, audiences and performers generate a temporary “aesthetic community” of shared meaning through corporeal and emotional co-vibration. Even if AI could simulate this form at the acoustic or visual level, it cannot participate in the process of “social self-confirmation,” because it lacks social identity as a species-being and cannot serve as a continuator of human cultural memory. In other words, AI can play music, but it cannot be recognized by the community as a “performer.”

Second, from the value of musical performance lies not in the “perfect reproduction of the work,” but in its processual and generative character. In *Art as Experience*, John Dewey emphasizes that art is art not because of its outcome, but because of “the continuous flow of experience and the emergence of meaning” [27]. Performance art is the paradigmatic form of such experiential generation: it unfolds in time, in the body, and in relationality. Every performance is a singular generative event, an aesthetic act jointly accomplished by performer and audience. By contrast, AI’s generative logic is grounded in repeatability and predictability, aiming at stable, optimal, and reproducible results—a logic that fundamentally conflicts with the contingency, presence, and open-endedness inherent in artistic experience. Paradoxically, the closer AI approaches technical perfection, the further it moves from the “living experience” that art seeks.

Third, from the standpoint of philosophical anthropology, the irreplaceability of musical performance also pertains to human self-understanding. Giorgio Agamben contends that “performance” is an act that gives sensible form to life—that is, it “makes life appear” [28]. The very *raison d’être* of performance art lies here: through the exhibition of body and affect, humans confirm their own presence. The advent of AI has prompted humanity to rediscover the preciousness of this experience of presence and generation. Far from destroying performance art, AI has made its uniquely human core value more visible: a manifestation of life that cannot be quantified, stored, or algorithmically replicated.

Finally, the future of musical performance may evolve into a new “human-machine collaborative” ecology. AI can assume structural and technical roles—generating accompaniment, simulating acoustics, integrating stage visuals—thereby liberating human performers to devote their creative potential to emotional expression, live interaction, and spiritual resonance. This collaboration does not diminish human artists; on the contrary, it returns art to its anthropological core—“being human as such.” By confronting the alterity of technology, humans re-affirm their own subjectivity, transforming art from the mere creation of aesthetic objects into an existential re-confirmation of human being.

Thus, the conclusion that AI cannot replace performing artists is not a technological failure, but a triumph of human art: it demonstrates that the value of art has never resided within the measurable domain of algorithms, but is forever rooted in the flow, intentionality, and presence of life itself.

5. Conclusion

The emergence of artificial intelligence art has, for the first time in human history, confronted us with the reality of creation by a non-living entity. It challenges not only humanity’s exclusive claim to artistic creation at the technical level, but more profoundly, at the philosophical level,

compels us to re-examine the fundamental questions: What is art? What is creation? And why do humans make art?

An examination of musical performance as a distinctive art form reveals that the advent of AI has not diminished the meaning of human art; on the contrary, it has brought into sharper relief those core dimensions of artistic activity that cannot be algorithmized: embodied vitality, co-present emotional resonance, and socio-cultural connectedness.

In the performing arts, the ultimate value lies not merely in the technical quality or formal beauty of the work itself, but in the embodied experience and emotional exchange generated in the live moment. What audiences perceive in a concert, theater, or stage performance is not only sound or movement, but the sense of living presence transmitted by the performer through body, affect, and intention. This “presence” and real-time interactivity render each performance a singular generative event. Although AI can replicate gestures, generate timbres, and simulate actions, it possesses neither autonomous emotion nor the capacity to establish genuine reciprocal interaction with an audience in the performance space. Consequently, no matter how far AI technology advances, its outputs cannot, at the experiential level, fully supplant the vital value of the human performer.

Furthermore, the sociocultural attributes of performance art reinforce human irreplaceability. Performance is not solely an aesthetic act; it is simultaneously a social ritual and an act of cultural transmission. While appreciating a performance, audiences simultaneously experience the performer’s connection to collective culture, the perpetuation of historical memory, and the affirmation of shared identity. AI-generated works may imitate form, but they lack social identity as species-beings and the capacity to bear cultural memory; thus, they cannot participate as recognized subjects in social recognition or cultural inheritance. In other words, AI can provide technical support, but it cannot become an artistic subject acknowledged by the socio-cultural community.

In summary, AI is capable of replacing repetitive, standardized technical processes in artistic creation, yet it cannot supplant the core values of the performing artist: lived experience, emotional expression, live interaction, and cultural symbolism. This conclusion points toward a future artistic ecology founded on a “human-machine collaborative” paradigm, in which AI assumes assistive technical roles, thereby liberating human artists to devote greater creative space to emotion and innovation in both creation and performance. At the same time, this collaborative model illuminates the anthropological core of performance art, reaffirming that artistic activity is not merely the production of works, but a practice of lived experience and cultural continuation. Through the complementarity of technology and human subjectivity, performance art will retain its uniqueness and irreplaceability in the new era, achieving a harmonious balance between technological progress and humanistic values.

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