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Transformation of Performing Arts and Fine Arts in the Digital Age: Technology, Aesthetics, and Cultural Heritage

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ABSTRACT
Digital technologies are changing how performing arts and fine arts are created, experienced, valued and remembered. This paper examines that transformation through three connected lenses: technology, aesthetics and cultural heritage. Using an integrative review of scholarship in digital performance, museum studies, computer graphics, artificial intelligence (AI) and cultural policy, together with recent institutional and market evidence, the study maps five technology families: digitisation and 3D capture, extended reality (XR), streaming and telepresence, generative AI, and blockchain-based tokens. It traces their effects on painting and sculpture, digital art, theatre, dance and music. The analysis shows that digital tools have shifted aesthetic value from the finished object toward process, interaction and immersion, and that they have produced hybrid forms of liveness in performance. They have also turned heritage collections into open, reusable data. Evidence from the COVID-19 period illustrates both the reach and the fragility of these changes. The National Theatre's free streams reached 15 million views in 173 countries, while nearly 90% of the world's museums closed. Online art sales doubled in 2020 and remained well above 2019 levels in 2024, but speculative art-NFT sales roughly halved within a year. The benefits are unevenly distributed. Digital access tends to reproduce existing participation gaps, aggregators over-represent Western collections, and generative AI raises unresolved questions of authorship and copyright. The paper proposes an integrated framework and governance levers, including inclusive access, fair remuneration, open standards and community-led curation, so that digital transformation can strengthen rather than erode artistic diversity and cultural memory.
Keywords: Digital arts; performing arts; fine arts; digital cultural heritage; aesthetics; extended reality; generative AI; liveness; digital divide**.**

1. INTRODUCTION

The arts have always been shaped by technology, from pigments and printing to photography, recording and film. The digital turn differs in scale and reach. A single infrastructure of networked computation now supports the creation, distribution, sale, preservation and study of almost every art form. Paintings are scanned into gigapixel images, sculptures into 3D meshes, dances into motion-capture files and theatre productions into streamable video. Generative AI systems can produce images, music and text from short prompts [1], [2].

These changes accelerated sharply during the COVID-19 pandemic. Nearly 90% of the world's museums, more than 85,000 institutions, closed their doors for periods of time, and almost 13% were judged at risk of never reopening [3]. Performing-arts organisations turned to streaming. The National Theatre's free YouTube

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programme reached 15 million views in 173 countries over 16 weeks in 2020 [4]. Art markets moved online too, with online art and antiques sales roughly doubling between 2019 and 2020 [5], [6].

Much of the literature examines these developments separately: digital performance in theatre studies [7], virtual heritage in computing [8], AI art in machine learning [9] and access in cultural policy [10]. This paper brings the strands together. It asks three questions. (i) How are digital technologies transforming the practice of performing and fine arts? (ii) How do these changes alter aesthetic categories such as originality, liveness and authorship? (iii) What are the implications for preserving, accessing and representing cultural heritage? The paper contributes an integrated framework, a technology-by-art-form synthesis and a set of governance levers for artists, institutions and policymakers.

2. CONCEPTUAL BACKGROUND

2.1 From Mechanical Reproduction to the Post-Digital

Debates about technology and art have long centred on reproduction. Digital media extend the debate because copies are perfect, cheap and endlessly transformable, and because the same file can serve as artwork, record and data set. Museum scholarship increasingly describes a post-digital condition, in which digital practice is no longer a separate project but a normal part of how institutions work [11]. The relevant question is therefore no longer whether the arts are digital, but how digital mediation reshapes value, experience and memory.

2.2 Liveness and Presence in Performance

For the performing arts the central concept is liveness, the shared presence of performers and audience in time and space. Histories of digital performance trace a long lineage of mediated theatre and dance. It runs from early multimedia experiments to telematic performances that link remote stages in real time, avatars and motion-captured digital doubles [7]. Streaming during the pandemic tested liveness at an unprecedented scale. It showed that many audiences value access and community even when physical co-presence is absent [4].

2.3 Digital Cultural Heritage

Digital cultural heritage covers both the digitisation of tangible works and the documentation of intangible practices such as dance, music and ritual. High-resolution 3D scanning of sculpture [12] and photogrammetric recording of monuments [13] established technical foundations for tangible heritage. Immersive technologies extend these records into interpretive experiences [8]. For intangible heritage, motion capture makes it possible to archive and analyse movement itself, not just its image [14].

3. METHODOLOGY

The study uses an integrative review design, appropriate for synthesising heterogeneous evidence across disciplines. Sources were selected in three groups. The first comprises peer-reviewed scholarship in digital performance, digital heritage, computer graphics and vision, AI, and cultural sociology. The second comprises authoritative institutional reports, such as museum, theatre and United Nations statements. The third comprises art-market data from the annual Art Basel and UBS reports. Evidence was coded against three analytical lenses (technology, aesthetics and heritage) and four transformation domains (creation, mediation, preservation and participation), as shown in Figure 1. The technology-by-art-form assessment in Section 7 is a qualitative synthesis by the authors based on this evidence; it is not a measured index.

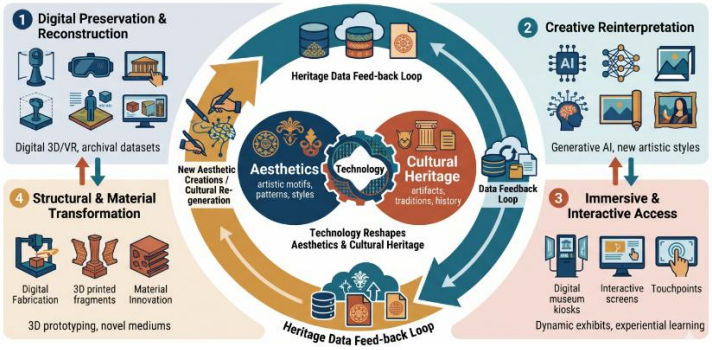

Figure 1. Integrated framework: technology reshapes aesthetics and cultural heritage across four transformation domains, while heritage data feed back into new creation.

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4. TECHNOLOGY AS THE DRIVER OF TRANSFORMATION

Five technology families account for most of the change observed. Table 1 summarises their primary uses and effects, and Figure 2 places key milestones on a timeline.

Table 1. Technology families transforming the performing and fine arts.

Technology	Fine arts	Performing arts	Heritage role
Digitisation and 3D capture	Gigapixel imaging, 3D scans of sculpture [12]	Recorded productions, motion capture [14]	Documentation, conservation, open access [15]
Extended reality (XR)	Virtual galleries, AR overlays	Immersive and site-specific works	Virtual reconstruction and museums [8]
Streaming and telepresence	Online viewing rooms, sales	Live and archived streams [4]	Wider, remote access
Generative AI	Image synthesis, style transfer [16], [17]	AI-assisted music, choreography and scenography	Training data drawn from archives [18]
Blockchain and NFTs	Digital provenance and sales [19]	Ticketing and fan tokens (limited)	Provenance records; speculative risk

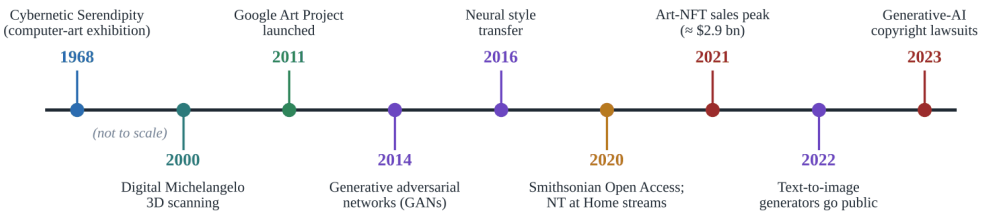

Figure 2. Selected milestones in the digital transformation of the arts (positions not to scale).

4.1 Digitisation, 3D Capture and Open Access

Digitisation began as documentation and has become a public resource. In 2020 the Smithsonian released about 2.8 million 2D and 3D images and associated data under a Creative Commons Zero dedication. This allows anyone to reuse them without permission [15]. Large aggregators such as Google Arts and Culture host millions of high-resolution artwork images [20]. Collections are thus turning into data that can feed education, research and new creative work.

4.2 Immersive and Extended Reality

Augmented, virtual and mixed reality are used in cultural heritage for education, exhibition enhancement, exploration, reconstruction and virtual museums. They are especially valuable when physical access is limited [8]. For artists, XR is also a medium in its own right that enables works in which the viewer's movement completes the piece.

4.3 Streaming, Telepresence and Online Markets

Streaming moved from a supplement to a lifeline during the pandemic and then became a permanent channel. After its free streams, the National Theatre launched a paid streaming platform in December 2020. About 40% of viewers of the free programme were under 35, and captions offered on every title were used by around 3 million people [4]. In the visual-art market, online sales rose from about $6.0 billion in 2019 to $12.4 billion in 2020 and peaked at $13.3 billion in 2021 [5], [19]. In 2024 they were $10.5 billion, still 76% above the pre-pandemic level, and dealers reported that 46% of their online sales went to first-time buyers [6]. Figure 3 summarises these trends.

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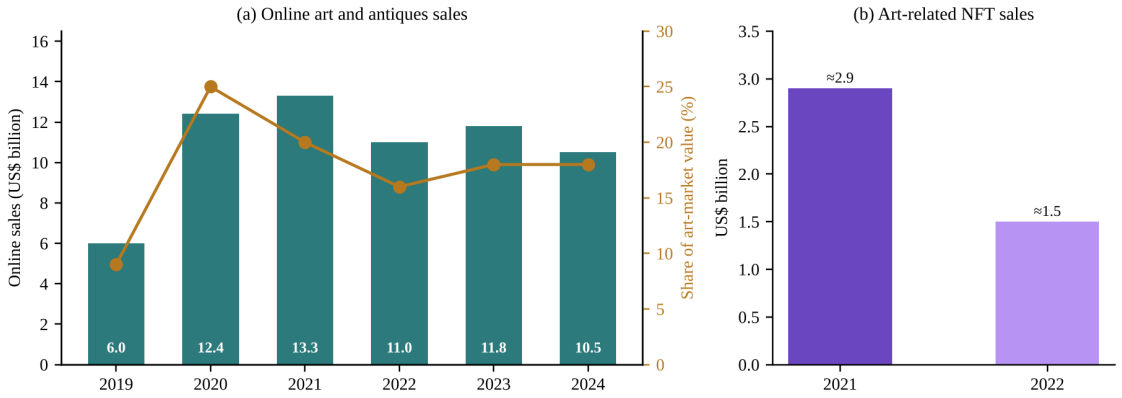

Figure 3. (a) Online art and antiques sales and their share of total art-market value, 2019–2024; (b) sales of art-related NFTs on platforms outside the art market, 2021–2022. Data: Art Basel and UBS reports [5], [6], [19].

4.4 Generative Artificial Intelligence

Generative adversarial networks [17] and neural style transfer [16] first showed that machines could generate and recombine visual styles. Systems such as creative adversarial networks were designed to produce novel rather than imitative art [21]. Text-to-image tools are now widely used. A large-scale study of artists who adopted them found increased productivity and higher peer ratings over time, alongside a convergence of content and style [2]. Such systems are trained on vast numbers of existing works, which has led to copyright lawsuits whose outcomes could shape the field [1], [18].

4.5 Blockchain and Non-Fungible Tokens

Non-fungible tokens (NFTs) promised verifiable digital scarcity and provenance. Sales of art-related NFTs on platforms outside the mainstream art market reached close to $2.9 billion in 2021 but fell by about 49% to just under $1.5 billion in 2022 [19]. The episode shows both the appeal of new ownership models and the risks of speculative markets for artists and collectors.

5. AESTHETIC TRANSFORMATION

Digital tools change not only how art is distributed but also what is valued in it. Table 2 contrasts established and emerging aesthetic orientations.

Table 2. Shifts in aesthetic orientation associated with digital practice.

Dimension	Established orientation	Emerging digital orientation
Locus of value	Unique, finished object	Process, system, interaction and versioning
Authorship	Individual artist	Distributed: artist, audience, code and AI [1], [9]
Liveness	Physical co-presence	Hybrid: live, streamed, recorded and asynchronous [7]
Spectatorship	Contemplative viewing	Immersive, participatory and navigable [8]
Originality	Scarcity of the original	Abundant copies; provenance by metadata or tokens [19]
Style	Personal and historical style	Algorithmic remixing and style convergence [2]

5.1 Fine Arts: From Object to Process

In painting, sculpture and photography, digital practice shifts attention from the finished object to the generative process. In generative and AI-assisted art the artist often designs a system, curates outputs and frames the result. Reviews of AI in art describe this as a move toward co-creative workflows in which judgement, selection and

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context become central artistic skills [9]. Evidence that AI-assisted output can converge in style suggests that distinctive vision becomes more, not less, valuable as tools spread [2].

5.2 Performing Arts: Hybrid Liveness

In theatre, dance and music, digital media have produced hybrid forms. These include productions designed for both stage and screen, telematic duets across continents, and performers who interact with projected or motion-tracked environments [7]. Streaming also changes dramaturgy, because camera placement, editing and close-up shape what the remote audience sees. The aesthetic task becomes the deliberate design of presence across media, rather than the defence of an unmediated original.

5.3 Audiences as Participants

Digital formats also turn audiences into participants who navigate virtual spaces, choose viewpoints, remix open collections and comment in real time. Accessibility features such as captions widened participation in practice. In the National Theatre case, about 22% of viewers used captions during the 2020 streams [4]. Participation, however, depends on who is connected and confident online, which is examined next.

6. CULTURAL HERITAGE: PRESERVATION, ACCESS AND REPRESENTATION

6.1 Preserving Tangible and Intangible Heritage

Digital capture creates durable surrogates of fragile works and sites. 3D scanning [12] and photogrammetry [13] support conservation, study and virtual reconstruction. For intangible heritage, digitisation goes further. Motion-capture libraries of folk dance, combined with methods that organise large dance collections, allow movement traditions to be archived, compared and taught when communities and transmission chains are under pressure [14]. Digital surrogates are not substitutes for living practice, but they can support its continuity.

6.2 Open Access and Reuse

Open-access policies change heritage from something viewed into something used. The Smithsonian's CC0 release explicitly invites commercial and non-commercial reuse [15], and similar policies at other institutions have made public-domain works widely available for education and creative remix. The same openness also makes these collections training data for generative AI, linking heritage policy directly to debates over AI and copyright [18].

6.3 Representation, Bias and the Digital Divide

Digital access does not automatically mean equal access. Analysis of UK participation data found that online engagement with museums and galleries tends to reproduce, and may even enlarge, existing inequalities rather than diversify audiences [10]. At the global level, a study of Google Arts and Culture found a strong imbalance toward content held in the United States, with some countries and institutions prioritised. The authors described this as digital cultural colonialism [20]. During the pandemic, only 5% of museums in Africa and Small Island Developing States were able to offer online content [3]. Without deliberate correction, digitisation may amplify existing hierarchies of cultural visibility.

7. DISCUSSION

7.1 Uneven Transformation Across Art Forms

Figure 4 synthesises the reviewed evidence into a qualitative assessment of how strongly each technology family is transforming each art form. Streaming has been most transformative for theatre and music, where recorded and live-streamed performance reached global audiences. Generative AI and NFTs have most affected digital and photographic image-making, where outputs are natively digital. Digitisation has been most transformative for painting and sculpture through documentation and open access. XR shows significant but still developing effects across all forms.

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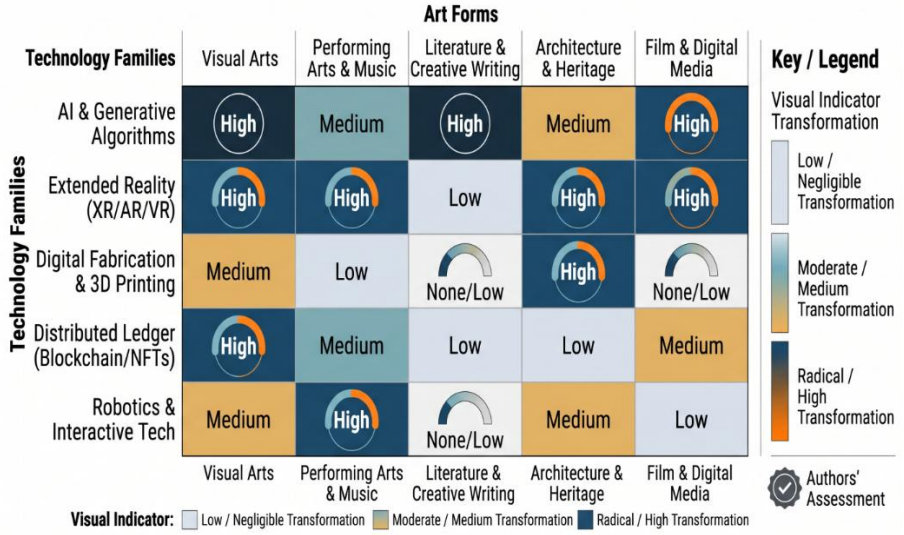

Figure 4. Qualitative synthesis of the degree of transformation by technology family and art form (authors' assessment based on the reviewed literature).

7.2 Opportunities, Risks and Governance

The evidence points to a consistent pattern: each opportunity carries a matching risk (Figure 5). Global reach comes with platform dependence and aggregator bias [20]. Open collections invite creative reuse but also unlicensed AI training [18]. New markets bring new buyers [6] but also speculation [19]. Wider access through captions and remote attendance [4] can still leave out people without connectivity or digital skills [3], [10]. Table 3 translates these tensions into recommendations.

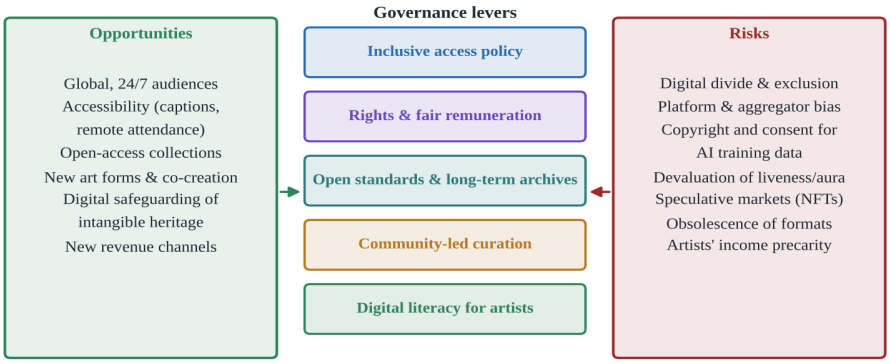

Figure 5. Opportunities and risks of digital transformation in the arts, mediated by governance levers.

Table 3. Recommendations for key stakeholders.

Stakeholder	Priority actions	Expected benefit
Artists and companies	Hybrid live/digital formats; capture and rights management; build digital literacy	Wider reach, new income, control over reuse
Museums and archives	Open standards and CC0 where possible; community-led metadata; long-term digital preservation	Durable, discoverable and representative collections
Platforms and AI developers	Transparent selection criteria; licensing or opt-out for training data; attribution	Trust, legal certainty and fairer value sharing [1], [18]
Policymakers and funders	Connectivity and access programmes; support for intangible-heritage digitisation; fair-pay rules	Inclusive participation and cultural diversity [10]

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8. CONCLUSION AND FUTURE SCOPE

The digital age has transformed the performing and fine arts at every stage, from creation through mediation and preservation to participation. Technology has expanded the means of artistic production and the reach of audiences. Aesthetic value has shifted toward process, interaction and hybrid liveness. Heritage collections have become open, reusable data. The pandemic showed how far these changes can extend, with millions of theatre views and a sustained online art market, and how fragile they remain, with museum closures, speculative NFT cycles and unequal digital access. The central conclusion is that digital transformation does not by itself democratise culture. Its benefits depend on deliberate choices about access, rights, standards and representation.
Future research should measure audience experience across live, streamed and immersive formats, assess the long-term economic effects of AI tools on artists' incomes, and develop community-governed models for digitising intangible heritage. Comparative studies from the Global South, including India's diverse classical and folk traditions, are particularly needed to correct the geographic imbalance in current digital collections and scholarship

REFERENCES

1. Z. Epstein et al., “Art and the science of generative AI,” Science, vol. 380, no. 6650, pp. 1110–1111, 2023,
2. doi: 10.1126/science.adh4451.
3. E. Zhou and D. Lee, “Generative artificial intelligence, human creativity, and art,” PNAS Nexus, vol. 3, no. 3, art. pgae052, 2024, doi: 10.1093/pnasnexus/pgae052.
4. United Nations, “Covid-19 crisis closes 90 percent of museums globally,” United Nations in Türkiye, May 20, 2020. [Online]. Available: https://turkiye.un.org/en/node/46499
5. National Theatre, Annual Review 2020–2021. London, U.K.: National Theatre, 2021. [Online]. Available: https://images.nationaltheatre.org.uk/uploads/2022/08/national_theatre_annual_review_2020-21.pdf
6. Art Basel and UBS, “The Art Basel and UBS Global Art Market Report 2022,” Art Basel, Basel, Switzerland, 2022. [Online]. Available: https://www.artbasel.com/stories/the-art-basel-and-ubs-global-art-market-report-2022
7. C. McAndrew, The Art Basel and UBS Art Market Report 2025. Basel, Switzerland: Art Basel and UBS, 2025. [Online]. Available: https://theartmarket.artbasel.com/download/The-Art-Basel-and-UBS-Art-Market-Report-2025.pdf
8. S. Dixon, Digital Performance: A History of New Media in Theater, Dance, Performance Art, and Installation. Cambridge, MA, USA: MIT Press, 2007.
9. M. K. Bekele, R. Pierdicca, E. Frontoni, E. S. Malinverni, and J. Gain, “A survey of augmented, virtual, and mixed reality for cultural heritage,” ACM Journal on Computing and Cultural Heritage, vol. 11, no. 2, art. 7, 2018, doi: 10.1145/3145534.
10. E. Cetinic and J. She, “Understanding and creating art with AI: Review and outlook,” ACM Transactions on Multimedia Computing, Communications, and Applications, vol. 18, no. 2, 2022, doi: 10.1145/3475799.
11. S. Mihelj, A. Leguina, and J. Downey, “Culture is digital: Cultural participation, diversity and the digital divide,” New Media & Society, vol. 21, no. 7, pp. 1465–1485, 2019, doi: 10.1177/1461444818822816.
12. R. Parry, “The end of the beginning: Normativity in the postdigital museum,” Museum Worlds, vol. 1, no. 1, pp. 24–39, 2013, doi: 10.3167/armw.2013.010103.
13. M. Levoy et al., “The Digital Michelangelo Project: 3D scanning of large statues,” in Proc. 27th Annu. Conf. Computer Graphics and Interactive Techniques (SIGGRAPH), 2000, pp. 131–144, doi:
14. 10.1145/344779.344849.
15. F. Remondino, “Heritage recording and 3D modeling with photogrammetry and 3D scanning,” Remote Sensing, vol. 3, no. 6, pp. 1104–1138, 2011, doi: 10.3390/rs3061104.
16. A. Aristidou, A. Shamir, and Y. Chrysanthou, “Digital dance ethnography: Organizing large dance collections,” ACM Journal on Computing and Cultural Heritage, vol. 12, no. 4, 2019, doi: 10.1145/3344383.
17. Smithsonian Institution, “Smithsonian releases 2.8 million free images for broader public use,” News release, Washington, DC, USA, Feb. 25, 2020. [Online]. Available:
18. https://www.si.edu/newsdesk/releases/smithsonian-releases-28-million-free-images-broader-public-use
19. L. A. Gatys, A. S. Ecker, and M. Bethge, “Image style transfer using convolutional neural networks,” in Proc. IEEE Conf. Computer Vision and Pattern Recognition (CVPR), Las Vegas, NV, USA, 2016, pp. 2414–2423, doi: 10.1109/CVPR.2016.265.
20. I. Goodfellow et al., “Generative adversarial networks,” Communications of the ACM, vol. 63, no. 11, pp. 139–144, 2020, doi: 10.1145/3422622.
21. P. Samuelson, “Generative AI meets copyright,” Science, vol. 381, no. 6654, pp. 158–161, 2023, doi:

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22. 10.1126/science.adi0656.
23. Art Basel and UBS, "The Art Basel and UBS Global Art Market Report 2023," Art Basel, Basel, Switzerland, 2023. [Online]. Available: https://www.artbasel.com/stories/the-art-basel-and-ubs-global-art-market-report-2023
24. I. Kizhner et al., "Digital cultural colonialism: Measuring bias in aggregated digitized content held in Google Arts and Culture," Digital Scholarship in the Humanities, vol. 36, no. 3, pp. 607–640, 2021, doi: 10.1093/llc/fqaa055.
25. A. Elgammal, B. Liu, M. Elhoseiny, and M. Mazzone, "CAN: Creative adversarial networks, generating 'art' by learning about styles and deviating from style norms," arXiv preprint arXiv:1706.07068, 2017, doi: 10.48550/arXiv.1706.07068.

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