



# The Intersection of Technology and Arts: New Mediums for Expression

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## ABSTRACT

This paper examines the dynamic convergence of technology and artistic expression, highlighting how new digital tools and platforms have reshaped creativity, communication, and cultural production. By tracing historical shifts from traditional to media-based and digital art forms, it examines how emerging technologies like artificial intelligence, augmented reality, virtual reality, and interactive media are influencing contemporary artistic practices. Artists and technologists are collaborating to blur the boundaries between creator and audience, digital and physical, real and virtual. Topics covered include digital and web-based art, the role of artificial intelligence in creation, social media's impact on art distribution, the emergence of NFTs, and interactive installations that engage audiences in novel ways. Through these lenses, the study discusses the philosophical, technical, and social implications of a technologically mediated artistic future. The paper concludes by emphasizing the importance of interdisciplinary dialogue in shaping a more inclusive and innovative arts ecosystem.

**Keywords:** Digital Art, Artificial Intelligence, Augmented Reality, Virtual Reality, Interactive Installations, New Media, Social Media.

## INTRODUCTION

Over the past few decades, new technologies have transformed creativity, communication, and production possibilities. Composers, musicians, sound designers, media, and visual artists have embraced these media, leading to the emergence of new genres at the intersections of diverse artistic practices, both traditional and contemporary. This evolution has resulted in a new paradigm of multi-faceted, multi-lingual, and multi-sensory artistic expression that often uses digital media in real time to explore themes like identity, memory, and our everyday interaction with screens. To fully appreciate these artistic expressions, interdisciplinary dialogue and collaboration between technologists and artists are essential, examining how technology alters art, cognition, and what it means to be human. Artistic practices that utilize technology for creation and performance are well-established, yet the role of technology as the central agent of artistic practice raises questions. While generative technologies exist that suggest autonomous content creation, they remain largely conventional tools within artistic productions. Research into transformative artistic practices where creative technologies autonomously generate sound and music performance genres is still in its early stages, only beginning to explore the potential of such aesthetic, technical, and algorithmic frameworks for music composition, which leaves much to be desired in depth and exploration [1, 2].

### Historical Context of Technology in Arts

Through the centuries, advancements in technology have transformed artists' work and their methods. This evolution provides context for understanding specific artworks, revealing artist intentions, audience perceptions, and their interactions. The impact of technology has been two-fold: it serves as a new material for exploring mediums that affect perception and experience, while also expanding how art is created and experienced by audiences. During the Renaissance, new machines offered fresh opportunities for artists, but the 20th Century shifted from machinery to media, challenging definitions of art and the role of the artist. Concerns about originality and objecthood arose with machinery; new media such as

film and computer networks further transformed art's purpose and appearance. The term "new media" gained traction in the 1960s as 'art by computers' emerged, prompting artists to consider the cultural implications of these technologies. Today, artists like GRL, IAA, and Geraci use electronic and digitally modified graffiti to showcase the intersection of technology and graffiti culture. In these works, graffiti enhances rather than solely constitutes the art form, turning it into an interactive event. Graham aims to create alternative experiences of art and technology, blurring boundaries between art and writing, as well as between the definitions of artist and writer. These artists challenge and redefine these roles [3, 4].

### **Digital Art: Evolution and Impact**

The digital art movement significantly contributes to the arts landscape through digital technology. However, the term 'digital art' suggests a separation from traditional analogue forms, despite analogue arts also often created and stored digitally. The origins of digital art can be traced back to Frieder Nake's work in computer graphics in 1966, setting the stage for this genre. Since then, the field has grown rapidly, driven by scientific advancements and the rise of new art forms like video art, installations, and internet-based art that depend on coding and network technologies. Presently, digital art includes not only computer-generated images but also contemporary practices like robotics, augmented reality, and AI-generated art. This evolution brings both opportunities and challenges for artists and audiences. The interplay between digital art and traditional forms is complex; both share techniques and genres, yet digital art often imitates traditional forms. A key distinction lies in their nature: traditional art emphasizes materiality and technical systems for execution, while digital art can reduce to programming and algorithms, sometimes lacking traditional artistic values. In traditional art, materiality is tied to human perception, whereas digital art uses numerical values, leading to a systematic de-materialization. As a result, receiving digital art is increasingly dependent on technological platforms, which highlight non-human production. Thus, the evolution of art in the digital age prompts a rich dialogue about creativity, expression, and the understanding of art in a technologically evolving context [5, 6].

### **Virtual Reality as a Medium**

The immersive experience is shifting towards merging real and VR environments. WebXR allows users to conveniently interact with XR applications on mobile devices or browsers. In the more familiar 3D animation rendering field, a powerful yet user-friendly package is open to the public for producing animated short films. The goal of this project is to make a 3D animation experience tool by utilizing the power of WebXR alongside a recent blended-AI technique to create a web-based generative animation tool named "Vanimix." The WebXR-enabled experience page of "Vanimix" allows audiences to interactively build a 3D animated presentation with few clicks. All the 3D assets, including model resources, textures, and animations, are generated by collaborating with the user to fill in a structured presentation outline and necessary parameters. The generated 3D animation is then collected and merged in the UI. This allows users to easily create short animations via Vanimix and access the experience page across different browsing devices. The proposed editing tool/experience page has been deployed and is available for public access. Augmented Reality (AR) is a technology offering new possibilities for Seismic Dashboards. Digital representations of human activities and physical environments are introduced into reality by computer vision, graphics, and display technologies to augment the visual perception of and interaction with the world. The goal is to study parties involved in the design and deployment of AR dashboards, their relations expressed by technical choices explicitly applying the meaning and concept of AR itself, and how these hybrids contribute to insights about humans and their activities relating to the possibility of AR as something inherently expressive. By discussing how different computational AR projects extend or even restrict the capacities for knowledge production and accumulation insight into AR in-between reality and virtuality is gained, advancing the discourse on affordances, the embodiment of knowledge, and the culture of designing and producing knowledge and insights [7, 8].

### **Augmented Reality in Artistic Expression**

Augmented Reality (AR) intersects digital, physical, and sensorial domains, with artists utilizing various emerging AR technologies from coding libraries to off-the-shelf devices. Key parameters defining AR include mood, participation, temporal, spatial, mixed-reality, personal, and embodied dimensions. Currently, artists are exploring AR as a medium for creative expression, examining key concepts and mapping their realization on physical devices. Specific dimensions of AR are analyzed alongside recent collaborations and future projects. This exploration is framed as a map, reflecting an ever-changing landscape influenced by community interaction with the technology. Artists delve into interactive storytelling through 3D, game engines, projection mapping, and AR, transforming surfaces into screens for immersive narratives and atmospheres. Site-specific works convert spaces into sensory experiences using sound, light, and smell. Long-term projects aim to augment local histories, infrastructure, and

narratives through installations and mobile applications. Another approach blends narrative structures with environmental events and interactions, including binaural sound, furthering research into AR as a medium. Beyond storytelling, exploration into data and sonification focuses on understanding real-time data and how to express it through AR. Contemporary AR technologies predominantly utilize phones to filter 2D content and videophones to inject virtual characters into real-world environments. Creative pursuits involve negotiating narrative actions beyond the camera's view and engaging more spatially with sound beyond headphones. Mapping interactions, information negotiation, tension points, personalization, and agency lead to emergent stories. Critical inquiries include what draws viewers into the action and how far their gaze can wander, transforming the AR experience. These elements are informed by Game Design and Emerging Media Studies, examining how new AR technologies can foster immersive augmented narratives [9, 10].

### **Artificial Intelligence in Creative Processes**

Artificial intelligence has been studied for decades, particularly in tales of consciousness raising ethical questions. In both scientific and artistic fields, creativity has been explored, especially with the rise of sophisticated AI models and human-computer interaction tools. This evolution prompts an investigation into AI's role in creativity. Topics such as destiny, fashion, love, and women's rights inspire unique pieces of art, reflecting the diverse influences on human perception and interaction with art, which relies on education, experiences, cultural backgrounds, and tastes. A transformation is occurring in the arts, with humans increasingly collaborating with machines. Algorithms generate art, text, and music with merely a sequence of prompts, producing hundreds of outputs in seconds, shifting the role of creatives to curators rather than original creators. This raises questions about AI and creativity, especially concerning the type of art, language, and algorithms used. Understanding these differences is key to grasping how AI tools influence the philosophical landscape of art-making. The capability of machines to generate art prompts philosophical inquiries into machine consciousness, the alignment of AI interests with human ones, and whether machines can decide like humans. It is vital to clarify that the term 'AI' is often misused, as intelligence is just one aspect of a broader computer-science problem involving various fields, each with different tools, leading to multiple definitions of AI. It has become common to view AI as a means of selecting or recombining input data in unexpected ways [11, 12].

### **Interactive Installations: Engaging The Audience**

Art has traditionally followed a one-way communication model where artists communicate with audiences who receive this encoded information. Auctions highlight intense interactions among producers selling various products, from tax shelters to broadcasting rights. After a performance of Shakespeare's plays, an actor encountered an artist eager to showcase his work; this led to an unexpected reaction from the audience, demonstrating a shift in dynamics where artists became addressed rather than just producers. The past twenty years have seen technological advancements that have transformed communication in art, influencing form and reception. New media have broadened the definition of art to encompass diverse methods and processes. Artists are increasingly engaging with interactive practices, moving beyond mere computer-based art to earlier forms, such as performance, which involved audience participation. The focus has shifted from spectatorship to active engagement with interactive installations, aiming to enhance the viewer's experience. The design of these interactive works emphasizes how the audience interacts with the art, which is crucial for encouraging engagement. Interactivity serves as a catalyst for audience response, with specific characteristics of installations shaping the viewer's experience and connection to the work [13, 14].

### **Social Media and Art Distribution**

The rise of social media has yielded a new format for the distribution of all forms of expressive arts. Social media's structure of access, use, and engagement favors the immediate consumption of artistic expression and its context. This has eliminated traditional gatekeepers from the art world and displaced longstanding hierarchies of the art establishment in favor of a more egalitarian and variable distribution of expressed art. But the downside of this change is the proliferation of hyper-reality and fictitious art practices on social media platforms. With an unwarranted population of artists, the ability to interact with others' experiences of art via posts and comments has enabled banal content to achieve viral status and short-lived ubiquity. With geography no longer a barrier for connection, the overwhelming attention required to participate in this new art world itself starts to replicate systemic inequities. The absence of a proper incentive structure creates a precarious environment for art practice. In this new, homogenized, mimicry-inducing art world, new possibilities arise for a re-imagination of practical art. Educational institutions play a key role in protecting the more niche and in-depth practices of the future. As has been evidenced by the growing number of schools with artistic programming on social media, young people are

being taught not only the technologies, but especially their obsessions. Schools can be a place for re-inventing social media as a tool for communal and participatory art, away from the competition for likes and artifacts needed to gain access to working in the earliest moments of art establishment. Described as an inevitable silo for the inartistically savvy, art institutions can be sites for consideration of how more interactive, immersive, design-based, and performative practices could exist in such media. Everyone growing up today will engage with, if not become, algorithmic art mediators. Those institutions best equipped to create futures of expressive reality and design for reception that promotes collation and liberation—rather than goals of sales, likes, or virality—stand to fundamentally reconstitute how art and social media interact [15, 16].

### **Web Art and Online Exhibitions**

With daily communication predominantly occurring online, many artists choose web art to display their work in virtual exhibitions. Programs like Flash and JavaScript serve as new digital mediums for expressing fine art and graphics, transforming ordinary visuals into interactive installations or performances. Known as net art, this concept reflects a broader interpretation of web art. However, ownership issues complicate matters when galleries claim rights over net artworks, conflating the art with its production means. Web art is classified into three categories: browser dependent, server dependent, and environment dependent. Java's use has dwindled because of its rare browser support. Generally, web art consists of Flash-based and HTML/JavaScript-based formats. The former is favored for its ease in creating visual effects, yet many artists overlook its closed platform nature. Although some software exists to convert Flash to open formats, it's infrequently used, leading to many artworks disappearing—resulting in a concentrated "native" art form. Artists using embedded players face similar challenges regarding the longevity of their work. Conversely, HTML/JavaScript allows for preservation of essence, albeit at the expense of some visual effects. The notion of "Just get rid of Flash" may not fully apply since art works are not entirely protected codes; viewers can capture or print static versions. However, these static interpretations risk losing their artistic essence, becoming mere objects when published on paper. Like the internet, these artworks are unstable and may cease functioning in the future, as has happened with many visually captivating pieces from earlier years [17, 18].

### **The Role of NFTs In the Art Market**

Contrary to expectations, the NFT art market has exacerbated the overall trend towards decentralization. NFTs have opened new opportunities for individuals to create and exchange art, lowering entry thresholds and costs. However, network analyses show the emergence of preferential buyer-seller ties, creating networks analogous to traditional art markets in both degree distribution and market dynamics. A similar pattern of increasing asymmetries has occurred in the NFT art market, highlighting the need for theoretical models that better incorporate the connection between mediatization dynamics and evolving network structures. NFT art is an emergent cultural mode of expression relying on novel platforms and media. NFTs were first used primarily in gaming, where users purchased in-game assets tied to transactions authenticated by blockchain technology. With NFTs based on the Ethereum blockchain, images or videos are transformed into digital tokens that open access to the underlying asset. NFT brokers act as technology and content intermediaries and charge transaction fees. NFT art emerged in March 2021, showcasing the need for sociological analysis to examine its success. Beyond understanding NFT art and assemblages, the study aims to make an empirical contribution by analyzing the overarching structure of the NFT art market. The originality of the research lies in considering NFT art as a phenomenon, focusing on its rapid rise, anywhere and at low cost. Initially framed as a bubble, financialization concerns emerged as payment paths were added. Procedural aspects of NFTs, information costs, and gatekeeping roles in platforms have been highlighted to assess quality control at scale. The NFT art market opened up new practices for individuals and significant sites of disparity, which are interconnected via primary and secondary markets. As sellers flock to peer platforms, attention turns to the buyer side [19, 20].

### **Sound Art and Technology Integration**

The avant-garde techniques of interactive graffiti bring the senses together: seeing, hearing, and understanding all become part of the one idea. By integrating graffiti, engineering, and computer programming, sounds emerge from graffiti. A new dynamic emerges as paint drops inform speakers to play a pre-recorded sound. When the audience members vary the noise level, the viewer's contemplations alter accordingly. When the audience can see, hear, and participate in the work, it is no longer a mere image, but a multifaceted experience. Graffiti and audio commentaries swirl around the observer, bringing with them the formal aesthetic of improvised jazz. The transformation of graffiti into music bridges identities, prompting a shift from an object to an experience. The medium is up for question in



this multimedia work that involves input from the physical world, and the graffiti must be exquisitely delicate when executed in order for the sound effect to occur. As a new hybrid art form still in its infancy, the interplay between sound and graffiti may manifest in ways not yet presented. Audience interactions may tell specific stories of the post-industrial city, or perhaps visuals graphic design would seductively lure the audience to play with music. Emerging technologies with interactiveness, multitasking, and accessibility are about to result in possibilities beyond arithmetic changes of form. In addition to aesthetic intricacy and public involvement, a broader acclaim is warranted for transformative interaction through sound. The process where sounds emerge from graffiti expands the capabilities of graffiti, exploits its overlooked potential in public places, and makes online experiences untapped. Most conceptions of graffiti writing pertain to the visible activity of applying paint to wall, however, art and abstraction fall short in graffiti [21, 22].

### **Film and Digital Technology**

It could be said that film and digital technology have created a new medium for art – a hybrid of visual and aural, moving and still, and sometimes even perceived with additional senses. The visual and aural technologies have been investigated as a medium for film and video in fine art, as well as the explorations of how such technologies converge with its materiality and genre. The surveillant capabilities of technology, voice contamination, interactive systems, etc., have also been explored as new practices. So the newest and unique digital technology of the cinema cameras, which are now being frequently used in art works, may be further explored through its possibilities and limitations. As digital technology had been positively and negatively examined already to some extent, the argument presented here is based on a specific digital equipment, a camera working with the newest high definition and high frame rate technology and giving a more desirably sensuous quality to the film. As this is a visual medium, cases of visual materials will be analyzed with also audio where necessary. While investigating the works of artists using film or video in the wide definition of it, more especially moving images, this writer has observed that much of the existent artworks are of duration longer than expected. The usage of such cheaper components as slowed-down CCTV and that of the manipulations on the original materials may function to widen the audience for them. Digital technologies have made the moving images easier to play back, and due to them being ephemeral and not easily holdable, more artists seem to explore this medium. The prevalence of the collectives and user-generated contents on the ubiquitous internet supports this argument [23, 24].

### **The Influence of Gaming on Artistic Expression**

Have you ever experienced an art installation, film, or concert that had a deep emotional impact? Such a powerful experience usually occurs as a result of a perfect balance of subject matter, atmosphere, and performance. The results of artist intent combined with viewer immersion are often very stimulating and sometimes profoundly moving. The same can be true for video games. A confluence of art, technology, and interactivity can create stunning new experiences and meanings. Being a part of the work, whether literally or figuratively, can expose the viewer to a wide range of feelings. Many works not classified as art could touch a viewer on an intellectual or emotional level, but this connection may not often occur through games. From a broader perspective, there are games that offer compelling narrative stories, as with a book or film. Then there are games that offer artistic, interesting, or beautiful visuals more traditionally associated with art. And, lastly, there are those that immerse the viewer in a fascinating sensory experience, as with good music or exploration art installations. Games also derive expression from the player in unique ways, passing the baton of the intention of experience and creation to the “viewers” of the work. They can become less about what the games themselves offer visually, audibly, or conceptually, and more about how alterable the experiences are. Though all games express content that is intelligible, many of the more socially acceptable artworks do not. Art, especially performance art, often pushes boundaries of expressible material and subject matter. The ability to see through the eye of a well-planned character or replace the point of view with a first-person camera can have effects not available through traditional art mediums. The ability to experience a character’s decisions may lead to different interpretations than a flat rendering of events. This can be a dynamic outcome, allowing players to experience material mundane or shocking. Many games aim to create feelings of childhood, nakedness and vulnerability, insanity, or simulation of reality; non-didactic and, in their own regard, expressive [25, 26].

### **Challenges and Controversies**

Computer-based art introduces new technologies and a participatory media environment, yet it faces the challenge of carving out its own identity amidst a complex landscape. A key issue is the artist-computer relationship: what distinguishes the artist’s creativity from the computer’s logic? The subjective

experience of art-making is transformed when it relies on code and algorithms. This raises fundamental questions about originality and ownership, especially in contexts of source and assemblage, redefining creative identities within a post-original framework. The fate of authorial agency intertwines with practices like sampling and recycling, as new media blurs authorship boundaries and enhances collaborative exchanges. This trend of recycling and remixing calls into question traditional notions of creativity and authenticity, pushing against the historical divide between 'Artist Art' and 'Art as Commodity.' Contextualization evolves, impacting definitions across visual arts and journalism. Cultural critique adapts within new media, shifting from a confrontational stance to a more integrated intellectualization that grapples with pervasive commercial influences. Contemporary artists, termed 'New' Situationists and subverters, are reprogramming commercial codes and exploiting mass media for subversive purposes. These developments prompt an evolving critique known as 'post-coding,' reflecting its dynamic and fragmented nature [27, 28].

### Future Trends in Technology and Arts

Technological and conceptual changes have disoriented the arts while also expanding inquiry into previously unfeasible domains. The narrow focus prior to 1970 has evolved into a diverse array of conceptual art practices. Though production, dissemination, and reception in art have significantly shifted due to technology, the core forms have not undergone radical transformation. However, the environment in which they exist has changed drastically. Artists need to adapt to these disruptions to engage with their culture's entertainment spaces, avoiding exclusion from social exchanges. A key question is whether dance can similarly adopt technological advancements. This inquiry brings forth political, economic, and institutional concerns regarding dance's creative integration of the technology that future generations will encounter. Is it wise for performance to venture into an uncertain future using undeveloped languages? What significance lies in advancing modern performance amid technological innovations that could jeopardize its essence? Within dance, who will take advantage of new technologies? Will artistic exploration redefine these changes or relegate them? Will contemporary dancers transition into multi-channel visual artists, or will their physical skills remain essential? Will new audience engagement modes undermine live performance or expand its reach? These questions arise amid the excitement over new technologies that offer artists diverse avenues for their work [29, 30].

### CONCLUSION

The intersection of technology and the arts represents a profound transformation in how we create, experience, and understand artistic expression. Technological advancements have expanded the boundaries of creativity, allowing artists to work across new dimensions—spatial, temporal, and interactive—while also raising philosophical questions about authorship, originality, and meaning. From the immersive realms of virtual and augmented reality to the algorithmic creativity of artificial intelligence and the decentralized landscapes of NFTs, technology has enabled novel forms of storytelling and audience engagement. Yet, these innovations also challenge traditional art institutions and practices, prompting a re-evaluation of value, access, and sustainability in the arts. As we navigate this evolving terrain, continued collaboration between technologists, artists, scholars, and institutions will be essential in shaping ethical, inclusive, and imaginative futures for art in the digital age.

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