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Research on AI-Empowered Immersive Experience Design in New Media Image Art

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Abstract. The rapid advancement of artificial intelligence (AI) is transforming new media art from passive "viewing" into deeper "perception," fundamentally reshaping immersive experiences. AI has evolved from a mere tool into a creative partner capable of independent production. Its integration with immersive technologies—virtual reality (VR), augmented reality (AR), and mixed reality (MR)—enables the construction of highly realistic digital worlds and interactive scenarios, broadening sensory engagement and enriching artistic encounters.At the creative level, AI technologies like computer vision and generative algorithms diversify artistic forms and redefine interaction with artworks. Audiences are no longer passive receivers but active participants, often co-creating with artists and AI systems. In turn, artists assume roles as guides, curators, and collaborative partners in dialogue with AI.This study examines applications ranging from digital heritage revival to narrative mixing in blended realities, analyzing emerging trends such as interactive storytelling and virtual humans. Together, these foster an open, dynamic, and personalized experiential model. Overall, AI-driven new media art is shifting from static "works" to ongoing "experiential processes." This shift democratizes creation, fosters deeper emotional connections, and pioneers new expressive forms—pointing toward a more immersive, inclusive, and collaborative artistic future.

Keywords: artificial intelligence, new media image art, immersive experience, interaction design

1. Introduction

At present, new media image art is at a very key development stage shaped by technology progress, cross-subject integration and cultural rebuilding, but this field still faces many problems to solve, such as wide technology popularization difficulties, rising social ethics and content safety issues, and challenges of building a healthy industrial ecosystem. In recent years, fast-developing AI has entered this field deeply and widely, changed the basic creative model of new media image art and brought many new changes to its aesthetic expression and story logic. AI speeds up the growth of this art form in three important ways including technology breakthroughs, industrial integration and social change, and this clearly shows AI's leading and important strategic value in this field. Clear proper AI use directions and strong needs from economic and social fields will be the main driving forces for the future development of new media image art.

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Using AI to create immersive experiences in new media image art has great practical value for the whole industry. It not only brings brand-new art display ways and promotes many new industry trends but also makes technology easier for ordinary people to use, so more and more independent creators join this field. Audiences change from simple "viewers" to active "participating creators" and gain deep immersion they have never had before. At the same time, creators shift from the only controllers in traditional models to partners working with AI systems, and this important change brings more social and emotional experiences to both creators and audiences. Also, smooth mixing of AI with VR, AR and MR technologies creates many interactions that closely link virtual and real spaces and greatly enrich people's feelings and experiences of the world around them. Moreover, AI-driven new media image art rebuilds the expression and spread of culture, turns traditional culture into dynamic, interactive and participatory visual experiences that are more attractive, revives old cultural treasures and rebuilds enterable historical scenes, and this makes culture communication change from static to dynamic forms and from one-way sending to two-way interaction between creators and audiences, expanding the limits of art and culture in many ways.

Against this fast-changing industrial background, this paper first examines the great new potential of AI in helping new media image art develop and the new expression forms in this field, then studies the practical uses of VR, AR and MR technologies in real art projects, and finally explores the innovative uses of AI in three cutting-edge areas including interactive narrative experiences, MR technology-built "interactive theaters" and increasingly popular virtual digital humans.

2. The innovative dimensions of AI-empowered new media image art

2.1. Artificial intelligence technology

Artificial intelligence (AI) is a very core part of computer science that has developed very fast in recent years, and its main goal is to build machine systems that can copy, extend and even expand human intelligence with basic skills such as perception, learning, reasoning and decision-making. Today, AI has moved beyond the stage of only theoretical study and entered a new period of wide use in almost every field, and great progress and breakthroughs have been made in key areas such as machine learning, deep learning, computer vision and natural language processing. These technologies are no longer just basic tools for simple tasks, but they have become a new "creative medium" closely mixed with social production, cultural industries and artistic creation.

AI is slowly changing both creators' art-making ways and audiences' art-watching and experiencing ways. For example, computer vision and graphics technologies can smartly analyze image content, change its art style and create new content quickly in real time, and this gives artists endless possibilities for art materials and forms. Natural language processing makes smooth and natural human-machine dialogue come true and provides dynamic power for interactive storytelling, so AI is no longer just a backstage technical helper, but it has become the main force driving big changes in the creative logic, expression forms and experience levels of new media image art.

2.2. Innovative expressions of new media image art

New media image art comes from the long-term mixing and integration of new media art and image art, and it is a new digital technology-based art form with main features of interactivity, immersion and time-based nature that make it different from traditional art [1]. At present, its creative forms are very diverse and grow every year, and the main forms include interactive installation art, VR and AR technologies, generative art and AI-driven creation, digital image projection and space exhibition,

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internet art and social media sharing, as well as bio-art and cross-subject integration with other fields.

New media image art is not totally separated from traditional art practices with a long history, but it gradually developed from early video art. Early video art was the main way to spread images to the public at that time, it used cameras and recording devices to capture moving pictures and paid much attention to time and flow in art works. For example, Peili Zhang's 1988 work 30×30 is widely seen as China's first video artwork, and it explored the close link between human behavior and time through repeated simple actions [2]. Early single-channel video installations usually played one video in a loop on TVs or projectors in exhibition spaces, and audiences just watched passively without real interaction with the works. Early installations put screens on walls and used multiple screens to show different content, creating early image installation forms. Traditional new media image art centered on video art and supported by simple technologies laid a solid base for today's immersive experiences in this field.

Figure 1. VR interactive design and presentation of dwelling in the fuchun mountains—painting the autumn landscape with a brush

Today, the technology, forms and creative ideas of new media image art have changed a lot compared with the early days, and these important changes help art spread in new ways and reach more people. Short-form content has grown very fast in recent years, mainly including popular micro-dramas, short documentaries and online films that fit people's habit of watching short videos on mobile phones in spare time. Works like Amazing China and Raise Your Head and See Happiness break big serious themes into easy-to-understand small daily stories, making viewers easier to immerse in the works and feel strong emotions [3]. At the same time, interactive films and TV shows appear and become popular, allowing audiences to choose different plot branches to influence story development and take real part in storytelling. New media image art often uses creative ways that mix different technologies, and it creates art in new and interesting ways with VR, AR, MR and AI-assisted tools [4]. Examples include virtual hosts introducing Dwelling in the Fuchun Mountains (As shown in Figure 1) and National Style: Peerless that uses XR technology to turn performers into Chinese chess pieces on stage. AI also automatically colors old black-and-white videos, improves picture quality and visual tones and creates amazing special effects that were hard to make before.

Today's new media image art has clear and obvious new features. First, personal daily stories replace grand historical themes and focus more on daily life and people's emotional connection. Second, stronger interactivity lets audiences join bullet-screen comments, online talks and secondary creation of works, helping content spread and co-creation. Third, cross-media mixing combines dance, theater, animation and other art forms and breaks long-existing traditional media limits.

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Finally, new technologies revive traditional culture in modern ways, such as using AI to rebuild cultural relics and XR to re-interpret classic poems for young people.

We can clearly see that new media images differ from traditional visual media in technology base, creation methods, spread ways, audience participation levels and expression forms. Lower technology barriers make visual creation easier for ordinary people without professional training, so new media image art develops better and faster than before.

3. Applications of virtual reality technologies in new media image art

The use of immersive technologies such as VR, AR, MR and extended reality (XR) in new media image art has gone far beyond showing technology abilities, and these technologies have become a new way to cooperate with and shape artistic creation. They build highly real digital worlds and redefine the close feeling and interaction link between audiences and artworks, and the mixing of these technologies is clearly shown in creating immersive experiences, changing old interaction ways and opening brand-new art expression levels that were impossible before.

3.1. AI-based generative narratives and interaction

XR technology mainly focuses on user-friendly visual and interactive design, mixes real and digital spaces through immersive interfaces and lets users interact with space in more natural and comfortable ways, and its main value is expanding the coexistence space of virtual and real things through different technology features [5]. Launched in June 2024, Awakening of Qin Tide is a large-scale XR immersive exploration project that attracts much attention, and it is also the first Chinese-made XR immersive experience project independently developed by a Chinese company without foreign help. Based on VR, AR, MR, holographic intelligence and other mixed reality technologies, it builds an immersive interactive space for many users to take part in at the same time [6]. Centered on long-history Chinese civilization, the project tells a story about future virtual exploration of the mysterious First Qin Emperor's tomb, and it has three separate story parts that run in the same physical place and form a connected series for audiences to experience continuously. Different from traditional XR projects limited by time and space for a small number of users, Awakening of Qin Tide is more social and open to more people, and its experience space can hold up to 100 people every hour at the same time.

Figure 2. Exhibition scene of awakening of Qin Tide

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When entering the exhibition space, audiences wear VR headsets and haptic vests that bring physical feelings and become story characters themselves. Each person gets a different identity and special task, and they need to work with other participants to find clues and solve puzzles in the virtual world, making people feel like they really "travel through time" to join a tomb adventure that perfectly mixes science fiction and exploration elements. In the huge grand tomb environment, people uncover thousands-of-years-old hidden secrets and finally meet mythical creatures from The Classic of Mountains and Seas in a virtual spatiotemporal setting. In interaction design, the project can recognize hand movements accurately and quickly, and audiences can control virtual things with natural body moves such as reaching out to use tools or waving arms to throw objects in the virtual world, breaking the clear line between virtual and real worlds and making people feel more present and involved in the experience.

Awakening of Qin Tide not only improves group experience through team puzzle-solving mechanisms but also creatively mixes Qin Dynasty history, The Classic of Mountains and Seas myths and modern science fiction settings, reinterpreting Eastern civilization in a new modern way loved by young people. The project changes from the one-way viewing model of common "exhibitions" to a multi-sensory and highly interactive "immersive story space", providing a scalable and reusable practical model for digital experience and intellectual property development of cultural heritage in the future.

3.2. MR technology in the immersive re-narration of cultural heritage

Yuzhen Studio's Seeking the Grotto is an 8K high-definition immersive visual work using head-mounted MR devices, and it was shown at the Dunhuang Contemporary Art Museum in July 2025 and won wide praise [7]. With high-precision 3D scanning and modeling technologies, it digitally rebuilds Cave 45 of the Mogao Caves in great detail and creates a virtual immersive space beyond the physical limits of the real cave.

Figure 3. Exhibition site of Seeking the Grotto

MR technology has great value in showing cultural heritage in more attractive cinematic ways. In Seeking the Grotto, MR not only builds an 8K panoramic immersive environment but also reshapes audiences' connection and communication with Dunhuang art. With high-precision 3D rebuilding and real-time interactive design, it goes beyond the flat two-dimensional story form of traditional films and TV shows, allowing audiences to "enter" a virtual cave combining history of different dynasties and see the cave digging and Buddha statue making from a very real first-person view.

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MR makes up for the big problems that cultural relics cannot be touched by visitors and original environments are lost or damaged over time, letting audiences intuitively "touch" and spiritually engage with thousand-year-old art creation sites and greatly improving their sense of presence and emotional connection with ancient art works.

4. Explorations of innovative applications of artificial intelligence technology

AI's new innovative uses have entered many fields around the world such as healthcare, advanced manufacturing, smart cities and cultural entertainment, and it has become a key driving force for industrial transformation and innovation in almost all industries. In the cross-subject field of new media image art, AI is no longer just a simple technical "tool", but it acts as a constructive "medium" and "collaborator" that reshapes art creation, spread and reception across three important dimensions including narrative logic, experiential structure and interactive subjectivity.

4.1. Interactive narrative experiences

Interactive narrative is an audience-centered story model, and its core is turning linear and closed story structures into open and changeable meaning systems through two-way information exchange between the system and audiences [8]. In this process, AI plays a very key role, using various content creation algorithms to calculate story branches in real time, create dynamic images and adjust content according to different audiences' choices, so audiences change from mere "viewers" to "participants" and even "co-creators" of art works.

As an important technology way to realize interactive storytelling, multimodal interaction represents a big development in human-computer interaction (HCI) that has changed greatly, allowing users to interact with systems through many natural communication channels such as voice, gestures, touch and eye tracking [9]. By analyzing audience behavior and decision-making data in real time, systems can dynamically adjust plot development, environmental changes and character behaviors, creating highly personalized and unrepeatable narrative pathways for each audience member. This experience form mixes visual, auditory and tactile feedback to build a full-sensory immersive narrative environment where every audience's decision meaningfully influences story progression. As a virtual space visual presentation, 360-degree panoramic environmental mapping deeply shapes users' first immersion feelings when entering the space [10]. These systems map story progression and emotional states onto changes of environment textures, colors and style elements, strengthening audiences' emotional perception of characters through visualized emotional expression [11]. A good example is Space Odyssey launched in 2023 by creative studio HOLLOGRIX, and this work clearly shows how AI expands the experience limits of interactive storytelling in new ways. It presents beautiful outer space visual landscapes through digital media and turns users into abstract virtual avatars. By tracking participants' body movements in real time, these avatars can freely explore and interact in virtual environments, building an immediate and direct link between body movement and immersive spatial experience [12].

4.2. MR technology and the construction of "interactive theater"

At the same time, MR technology-driven interactive theater is forming a new popular immersive performance form. MR interactive theater seamlessly mixes virtual content with real physical space, allowing audiences to move freely in a designated area, take part in plot interactions and even change story development, greatly enriching everyone's immersive experience. It breaks away from

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the hundreds-of-years-old fixed-seat viewing model of traditional theater, and every audience movement may trigger different narrative clues, letting audiences truly take part in dramatic performances and experience events from a first-person perspective [13]. Through gesture recognition, eye tracking, motion capture and other technologies, audiences' body movements can directly control virtual characters or influence story progression, creating interesting embodied immersive experiences such as "reaching out to touch virtual flower petals" or "turning footsteps into rhythmic drumbeats". This not only improves the modern expression ability of traditional culture but also greatly deepens audience participation and narrative engagement with works.

Besides, virtual digital humans (also called virtual humans or intelligent digital beings) have gradually appeared as a new "interactive subject" in new media art. Driven by technology progress and strong market demand, digital humans are entering more industries and fields, and companies such as Alibaba Group, ByteDance, Huawei Cloud and Feitaike have all developed their own virtual human technologies [14]. These virtual entities have realistic human-like looks, facial expressions and interaction abilities, and they are generally divided into AI-driven and human-driven types according to their working ways. Although digital humans are widely used in entertainment, cultural tourism, media and e-commerce, their artistic application potential deserves more and more attention. From popular virtual figures such as Liu Yexi and Luo Tianyi to culturally symbolic digital personas such as Ling, these virtual images all rely on key technologies including 3D modeling, AI-driven systems and real-time rendering [10]. Furthermore, artists and audiences can use these technologies to make virtual digital humans modeled after themselves, and these entities can serve as exhibition guides, interactive participants or even conversation partners with audiences. For example, they can talk with audiences about art works or join creative reflection with creators, and such interaction modes not only broaden art work interpretation ways but also provide richer and more multidimensional channels for art meaning communication [11].

We can use virtual digital humans, MR, VR, AR, AI and other technologies together to create an immersive interactive experience theater named "Tracing the Ancient Secret Realm", where audiences enter the theater as virtual digital humans themselves. The theater works well with digital human modeling, AI interaction, motion capture, multimodal perception, real-time rendering and other technologies. Characters are divided into four digital human identities including Guardian of the Secret Realm, Explorer Tourist, Reclusive Sage and Clue Messenger, and the narrative focuses on solving mysteries in an ancient town's secret realm as the main plot. In the theater, audiences interact by solving puzzles, unlocking new storylines and getting a wonderful immersive experience.

Overall, from interactive storytelling and MR interactive theater to virtual digital humans as emerging interactive subjects, AI is systematically reshaping the creative paradigms and reception models of new media image art. AI has gone beyond the role of a simple technical tool and become a core medium and collaborative creator for narrative construction, experiential activation and relationship reconfiguration between people and art, driving art to a more open, immersive and friendly development stage where humans and AI work well together.

5. Conclusion

In summary, AI technology has changed from a simple auxiliary tool to a core medium and collaborative creator that drives systematic innovation of new media image art. Through computer vision, natural language processing and other technologies, AI not only provides endless form possibilities for art creation but also fundamentally reshapes the whole chain of content generation, narrative logic and experience modes. The mixing of immersive technologies including VR, AR and MR with AI helps build highly realistic digital environments and natural multimodal interactions,

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turning audiences from passive viewers into "participatory creators" and "real-time directors" who can deeply intervene in narratives and influence art work development, and art experience thus advances from simple physical presence to deep psychological immersion that touches people's hearts.

These developments including interactive storytelling, MR interactive theater's real-virtual integrated experiences and virtual digital humans as emerging interactive subjects together outline three major frontier fields of AI-empowered new media image art. Such practices not only promote the democratization and socialization of art creation by lowering technology barriers for ordinary people but also open dynamic two-way paths for the modern expression and spread of cultural heritage by reviving traditional cultural intellectual properties and rebuilding enterable historical scenes.

Looking to the future, the integration of AI and new media image art will keep moving toward greater openness and human-AI collaborative co-creation, and art will increasingly shift from static closed unchangeable "works" to dynamic continuously developing "generative experiences". In this process, creators will keep turning into AI system guides and collaborators instead of sole controllers, and the core direction of technology development will still focus on expanding perception dimensions, deepening emotional connections between people and art and rebuilding modern cultural expression modes. Finally, this evolution will push art to a new stage with greater immersion, inclusiveness and human-technology symbiosis.

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