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The Practice and Research of AIGC Technology in Digital Media Art Creation

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Abstract: This paper delves into the transformative impact of Artificial Intelligence Generated Content (AIGC) on the landscape of digital media art creation. The rapid advancement of AIGC technology in recent years has ushered in a new era of creativity and innovation within the digital realm. This study traces the evolution of AIGC, from its theoretical foundations in the mid-20th century to its current applications across various digital media formats. It examines the multifaceted applications of AIGC in generating text, images, videos, and music, highlighting its profound effects on creative practices and artistic expression. The paper further explores the role of AIGC in revolutionizing immersive experiences in digital theater, streamlining the production of AI-powered movies, and significantly enhancing the efficiency of game development. Additionally, it envisions the future potential of AIGC in fostering cross-industry innovation and democratizing access to digital media art creation. By analyzing both the current capabilities and future prospects of AIGC, this paper provides a comprehensive overview of its integration into the digital media art ecosystem and its implications for the future of artistic creation and consumption. The research underscores the immense potential of AIGC to empower artists, broaden creative possibilities, and reshape the digital media art landscape in the years to come.

Keywords: AIGC Technology, Digital Media Art, Creative Practice, Art Research, Cross-Industry Innovation

1. Introduction

AIGC (Generative Artificial Intelligence) technology is surging globally, attracting widespread attention [1]. In terms of investment, Stability AI has received substantial funding, becoming a unicorn enterprise, demonstrating the significant commercial potential of AIGC. In research, US companies like OpenAI, Google, and Microsoft have made breakthroughs in natural language processing, image generation, and automatic content creation. The popularity of ChatGPT proves the powerful capabilities of AI in conversation generation and text processing [2]. Chinese tech giants (Baidu, Alibaba, Tencent) and research institutions are also actively involved, promoting technological advancements and application implementations. Domestic universities frequently achieve research results in the field of artificial intelligence. In terms of application, AIGC has achieved remarkable results in the art field. AI drawing software (such as MidJourney) and AI-created short films have won awards, showcasing the potential of AIGC in artistic creation. Film companies and industry leaders hold an optimistic attitude towards AIGC. Guo Fan, the director of The *Wandering Earth* stated that he will continue to apply AIGC technology, and Huace Film & TV

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established the AIGC Application Research Institute. In conclusion, AIGC provides new tools and expression methods for artists and creators, promoting changes in the digital media art creation ecosystem and having a profound impact on digital media art creation [3].

With the continuous development of AIGC technology, its role in the process of digital media creation has become increasingly prominent, providing artists and creators with new tools and means of expression [4,5]. By conducting in-depth research on the historical development, current status analysis, and specific application cases of AIGC technology in digital media art, this paper aims to comprehensively analyze the actual empowerment of AIGC technology to digital media art creation, and at the same time explore its possible future development direction.

2. The application types of AIGC technology in digital media art creation

2.1. AI exploration of script text

In today's era of rapid development of science and technology, artificial intelligence technology is gradually penetrating into all aspects of our lives, among which the field of text generation has attracted much attention. With given keyword instructions, AIGC technology can not only generate a large amount of text content, but also show amazing potential in the field of creativity. AIGC technology can imitate the human text creation process through technical means such as deep learning and natural language processing. Through large-scale data training, AIGC models can learn the structure, grammatical rules and common expressions of the language, thereby generating language-compliant text. Standardized text. The application of this technology allows AIGC to generate a large amount of text content in a short period of time, providing convenience for creators.

In 2016, *Sunspring* debuted as a short film script written by AI algorithms at the SXSW (South by Southwest) Music and Film Interaction Festival, a technology and art event in Austin, Texas, USA. The short film was directed by director Oscar Sharp, and the script was generated by the AI program "Benjamin", which was developed by playwright Ross Goodwin. The plot of the film takes place in the future world and revolves around three characters: H, H2 and C. The dialogues and actions of these characters are believed to be generated by AI procedures, leading to some very strange and incoherent plot developments and dialogues. Because AI does not have human emotions and understanding abilities, the lines in the script often seem absurd and bizarre, confusing and surprising the audience.

The production of *Sunspring* is an exploration of AI technology in film creation. Although the film itself may be considered a cinematic experiment on AI-created scripts, it demonstrates the potential of AI in the creative field and how AIGC generates text generation technology works with human actors to create new art forms. This short film triggered people's in-depth thinking about the potential role of AI in film creation, and set off the discussion and exploration of AI-generated text. Not only in the film field, by designing different model architectures and training methods, AIGC can generate texts of various styles and themes, from poetry, novels to advertising slogans and other text forms, which can be creatively presented through AIGC technology. This kind of creative text generation can not only meet people's appreciation needs for literature and art, but also provide innovative solutions for advertising marketing, cultural and creative industries and other fields [6].

2.2. Digital innovation of visual images

Image generation is a revolutionary technology that is driving the digital revolution of visual images. Through the advancement of artificial intelligence and deep learning algorithms, image generation technology is able to generate realistic image content with unprecedented accuracy and efficiency, thus bringing a significant impact to various fields [7,8].

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Image generation technology offers new possibilities for artistic creation and design. Artists and designers can utilize these technologies to generate pieces of images in a variety of styles and themes, from traditional paintings to modern digital art, as well as visual effects in virtual reality and augmented reality applications. This innovative image generation method not only brings greater creative flexibility and creative space to creators, but also enriches the form and expression of artistic works.

Currently, there are two forms of image generation with AIGC technology. The first form is Vincent Graph, which inputs text into AI software to generate pictures that match the text. This method can realize the visualization of descriptive words, thus helping people understand and express ideas more intuitively.

For example, artist Jason Allen created the work *Space Opera House* by constantly adjusting keywords for AI software, and won the championship in the art category of the Colorado State Fair Art Competition, The Space Opera House is shown in Figure 1.

Figure 1: Space opera house

The magnificent opera scene depicted in the painting *Space Opera House* makes people feel like they are in a different world. The huge circular window projected a warm yellow halo, as if the stars in a galaxy were shining on the stage. This light penetrated the illusory audience and sprinkled on the stage, outlining a mysterious and solemn atmosphere. On the stage, the actors have different postures. Although it is difficult to distinguish their specific forms, they can feel the passion and emotion flowing in them. The light sources on the left and right sides of the picture are dim, forming a deep shadow, which makes the picture more mysterious and dreamy. Details such as the decoration above the circular window are quite Mayan slate relief style, which adds a touch of ancient and mysterious atmosphere to the whole scene. The picture seems to be traceable, but it is full of disorderly and erratic atmosphere. This combination of certainty and uncertainty enables viewers to not only find some clues, but also feel a sense of mystery beyond reality when appreciating works. By constantly adjusting keywords and using AI software and post-processing technology, the artist created this amazing work, which perfectly combines art and technology, showing unlimited creativity and imagination.

The second form is graph-to-graph, which uses existing images to generate new images. This approach typically uses deep learning models, such as generative adversarial networks (GAN), to learn the features of existing images and generate new images that are similar but not identical. This technique can be used for image enhancement, image restoration, and other applications.

In terms of image enhancement, graph generation graph technology can generate clearer and more detailed images by learning the features of existing images. For example, GAN can be used to enhance the quality of low-resolution images to make them look sharper and more realistic. For example, the NoGAN algorithm are used to effectively color and restore Bohr's old photos, thus making these historical photos more vivid and realistic.

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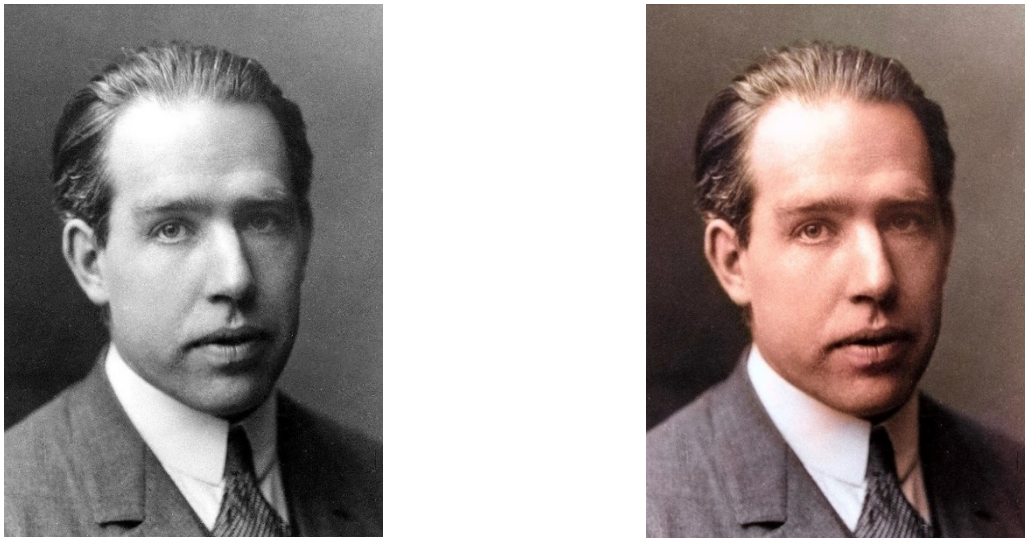

(a) Original picture (b) Color pictures

Figure 2: NoGAN algorithm realizes effective coloring and restoration of Bohr's old photos

In addition to text-to-graph and graph-to-graph technologies, AIGC technology also plays an important role in image style conversion. In terms of style conversion, image generation technology can utilize deep learning models to combine the content of one image with the style of another image by training content images and style images in samples, thereby generating images with new styles. This technique can be applied in many fields, including artistic creation, image editing, video special effects, etc. Through picture-to-picture technology, this technology enables artists and designers to quickly change the style and appearance of images through simple input, providing more possibilities for the creation of digital media art.

3. The role and influence of AIGC technology in empowering digital media art creation

3.1. Deeply create an immersive digital theater

As an ancient performing art, drama has experienced a long historical evolution. From the initial simple emotional expression, it gradually evolved into a profound humanistic emotional performance form. Hanstis Lehmann, a famous German theater theorist, divides the development of world drama into three important periods: pre-drama theater period, drama theater period and post-drama theater period in his book *Postdrama theater period*. The pre-drama theater period mainly revolved around the behavior of "watching", but with the end of the neoclassical era, the active creation of playwrights gradually became the mainstream, leading western drama into the drama period. Then, after the 1970s, the field of western drama was influenced by postmodernism, and the drama text was no longer the only core of performance, and the elements such as music, dance and scenery were equally important, which made the drama enter the post-drama theater period. This period emphasizes the performance nature of theater as a social practice, which liberates theater art from fictional roles, realistic imitation and solidification mode.

With the development of the times and science and technology, the form of drama is constantly evolving. In 1968, Richard Scheckner, an American avant-garde drama master, put forward the "Six Principles of Environmental Drama", emphasizing that the performance space of drama is not restricted by the traditional stage. Under his philosophy, immersive drama evolved from

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environmental drama. In immersive drama, the audience can move freely in a specific performance space, choose the role to play, and even participate in the drama performance, and experience completely different plots from different viewing angles. This form of interactive deduction not only helps the audience to understand the drama more deeply, but also brings the audience a real experience, making them a part of the story and arousing the emotional resonance of the audience.

With the increase of art forms, the concept of immersive drama has been sublimated and supplemented, forming the concept of "immersive theater". Immersive theater is an art form that combines modern technology with elements of stage performance. In immersive theater, the audience is no longer a passive viewer, but is guided into a fully immersive artistic environment, interacting with and integrating with the theatrical work. Some scholars believe that in the historical process of drama development, the rise of digital media art is regarded as an important milestone in the performance transformation of contemporary drama field. The rise of digital media art provides new possibilities for the creation and realization of immersive theaters. Among them, the application of AIGC technology makes immersive theaters have important technical and theoretical support for the transformation of digital theaters. In digital theater, the creative team can immerse the audience into the world of theater works through virtual reality technology, augmented reality technology and intelligent interaction. AIGC technology plays a key role in the process of building a concrete immersive theater into an abstract digital theater, providing creators with a variety of content generation and presentation methods, greatly enriching the expression forms and viewing experience of theater works [9].

For example, in June 2023, a 45-minute immersive virtual reality performance *The Vanishing Pharaoh* created by the French VR content brand Excurio and the archaeological team of Harvard University's Giza Project in the United States pushed the concept of digital theater to a new level. height. Instead of passively watching the performance, the audience wears special VR glasses and equipment, enters a completely digital world, and interacts with virtual scenes and characters. This digital theater experience provides audiences with an unprecedented sense of immersion and participation, which makes them feel as if they have truly stepped into the mystery of ancient Egyptian pyramids.

3.2. Multi-dimensional support for digital media AI movies

The innovation of AIGC technology has introduced a new form of creation in digital media art creation, namely AI movies. AI movies are an emerging form of using AIGC technology to create, write, direct and produce movies. AI movies are usually classified as digital media art because they are film and television works generated or created using artificial intelligence technology. Although they may be presented in film form, their creative process and technical means are different from traditional film production, and more involve technologies such as digitization, algorithm generation and machine learning. AIGC technology plays a vital role in the field of AI movies, providing digital media art creators with a variety of content generation and presentation methods, thereby helping to create unique and imaginative AI movies.

For example, on March 6, 2024, the world's first groundbreaking feature-length film *Our Terminator 2 Reset* produced by AI held its offline premiere in Los Angeles, USA. This film was completed by a creative team composed of 50 artists in the field of AI. It is a remake of the classic science fiction film *Terminator 2* (1991). It presents a world where humans fight against the rule of ChatGPT and explores the impact of contemporary AI development. The team utilized multiple AIGC tools such as Midjourney, Runway, Pika, Kaiber, Eleven Labs, ComfyUi, Adobe, and more, while not using any footage, dialogue or music from the original film, ensuring that all content in *Our Terminator 2 Reset* Edition is original.

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Although the release of this film has attracted some attention, from the quality of the trailer, it really can't match the visual shock brought by traditional movies. Many details can't stand scrutiny, such as the inconsistent mouth shape of the characters, and the obvious sense of disobedience in the shaping of characters. Nevertheless, the advent of this film is enough to prove that AIGC is capable of generating independent films. From the perspective of movie content development, AIGC technology has broad application prospects in script design. Based on a large amount of text data and intelligent algorithms, AIGC technology can generate scripts with logical coherence and attractive plots, providing a foundation for the creation of AI movies. The basic framework is provided. From the perspective of character design, AIGC technology can generate a variety of virtual characters, including appearance, expression, voice and other features. From the perspective of scene generation, AIGC technology can help creators quickly generate various realistic virtual scenes, including historical scenes, fantasy worlds, future cities, etc. These virtual scenes can be presented to the audience through special effects technology, making them feel as if they were in another world, enhancing the immersion and viewing experience of the movie.

4. Conclusion

AIGC technology has shown great potential in the field of digital media art and will continue to play an important role in the future. With the continuous progress and innovation of AIGC technology, we can expect more digital media art works empowered by AIGC technology to emerge, bringing new artistic experiences and concepts to people. In the future, AIGC technology will continue to be combined with other cutting-edge technologies such as augmented reality (AR), virtual reality (VR), blockchain, etc. to further expand the boundaries of digital media art. The comprehensive application of this technology will provide artists with richer creative tools and forms of expression, and at the same time accelerate the popularization and development of digital media art. In addition, the widespread application of AIGC technology will also promote the cross-border integration of digital media art and other fields, including science, engineering, medicine, commerce, etc. This cross-border cooperation will inject more innovative thinking and practical experience into artistic creation, and push digital media art to a more open, diverse and forward-looking direction.

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