Exploring the Applications of AI-Generated Art in the Cultural and Tourism Industry

——A Case Study of Sora

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Abstract. In the current digital age, the rapid development of artificial intelligence has penetrated into various aspects of life, including the field of artistic creation. This study aims to explore in-depth the application of AI-generated art, comprehensively understand the potential of AI in the artistic field, and explore its application prospects in the cultural and tourism industry.

Keywords: AI-generated art, Sora, AI, Cultural and Tourism Industry.

1 Introduction

This study delves into the value and potential of AI-generated art in practical applications. Through case studies, it elucidates how Sora brings innovative solutions to the cultural and tourism industry, showcasing how artistic creation further expands the application areas of artificial intelligence. The research emphasizes the importance of continuing to explore AI-generated art and highlights its profound significance in the cultural and tourism industry.

2 AI-generated Art and Its Applications

2.1 Artificial Intelligence

Artificial Intelligence (AI) refers to the theory, methods, techniques, and application systems that simulate, extend, and expand human intelligence, enabling computer systems to have capabilities similar to human intelligence. The core goal of AI is to enable computer systems to mimic human thought processes, including learning, reasoning, planning, perception, and understanding natural language, among other intelligent behaviors.

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Currently, AI has been widely applied in various fields, including art creation, bringing profound impacts on the ways of creation, tools, content creation, and the reception and appreciation of artworks.

2.2 AI-generated Art Art and Current Applications

2.2.1 AI-generated Art

AI-generated art refers to various artworks generated using artificial intelligence technology, including but not limited to painting, music, literature, imagery, etc. These works are not directly created by human artists but are generated with the assistance or full automation of AI algorithms and technologies.AI-generated art includes AI-generated images, music, literature, paintings, videos, and more.

2.2.2 Current Applications of AI-generated Art

1. Digital Media and Entertainment Industry

In the digital media and entertainment industry, artificial intelligence is widely applied in video production and special effects. AI technology can be used for automated video editing, clipping, and post-processing, improving the efficiency and quality of video production. Additionally, AI can generate various visual effects, including virtual scenes, dynamic effects, etc., adding more creativity and visual impact to film and television works.

2. Advertising and Marketing

Artificial intelligence technology is widely used to generate various forms of artwork, including painting, sculpture, music, literature, etc. By training models and algorithms, AI can learn the styles and creative techniques of artists and generate artwork with similar styles. These works can be digital art, oil painting styles, classical music, etc., enriching the possibilities and diversity of artistic creation.

3 Analysis of Application Cases of AI-generated art in the Cultural and Tourism Industry

As a text-to-video tool in AI-generated Art, Sora demonstrates the potential of artificial intelligence in creative generation, artistic value, and artistic innovation, bringing new possibilities for the application of AI-generated Art in various fields.

3.1 Sora

In February 2024, OpenAI released an AI model named Sora, which converts text into videos, capable of generating lifelike HD videos up to 60 seconds based on textual descriptions. OpenAI researchers chose the name "Sora" (meaning "sky" in Japanese) to emphasize the feeling of "infinite creative potential." OpenAI's Sora application presents a revolutionary tool for artists, offering a wide array of applications and pos-

sibilities within the realm of art. Its impact on artistic expressions, the changes it brings to the artistic landscape, as well as potential challenges and future prospects.

3.1.1 Turning Visual Data Into Patches

Researchers draw inspiration from large language models that develop generalist capabilities by training on vast amounts of internet-scale data. Sora utilizes visual patches. Previous studies have demonstrated that patches are an effective representation for models handling visual data[1-4]. These patches are scalable and efficient for training generative models on a variety of videos and images. The comparison below shows video samples with fixed seeds and inputs as training progresses. As shown in Figure 1, the quality of the samples improves significantly with increased training computation.

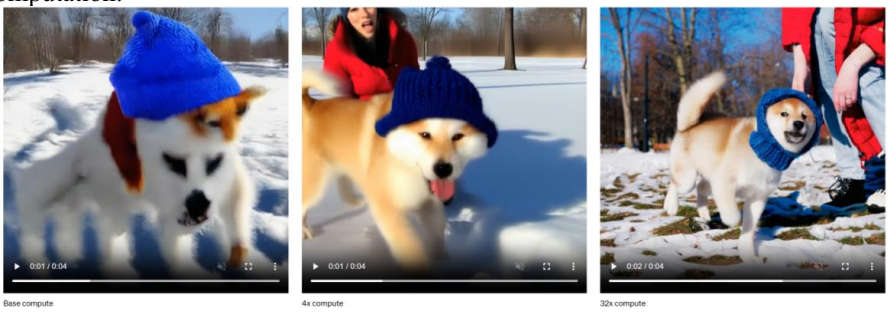


Fig. 1. a dog[1]

3.1.2 Language Understanding

Training text-to-video generation systems necessitates a substantial collection of videos paired with corresponding text captions. Researchers employ the re-captioning technique from DALL·E 3[5] for videos. They discover that using highly descriptive video captions in training enhances text fidelity and improves the overall quality of the generated videos. As shown in Figure 2, GPT enables Sora to produce high quality videos.

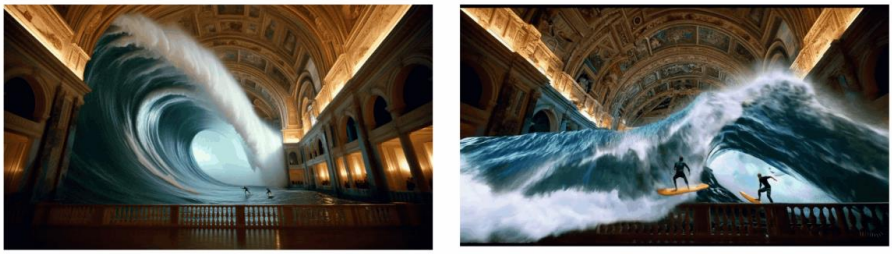
Fig. 2. a toy robot[2]

[1] https://openai.com/research/video-generation-models-as-world-simulators
[2] https://openai.com/research/video-generation-models-as-world-simulators

3.1.3 Prompting with Images and Videos

Sora can also be prompted with other inputs, such as pre-existing images or videos. This capability allows Sora to perform various image and video editing tasks, such as creating perfectly looping videos, animating static images, and extending videos forwards or backwards in time. Sora is capable of generating videos when given an image and a prompt as input. Below, researchers present example video screenshots(Figure 3) generated based on DALL·E 2 [6]and DALL·E 3 images.

An image of a realistic cloud that spells "SORA".



In an ornate, historical hall, a massive tidal wave peaks and begins to crash. Two surfers, seizing the moment, skillfully navigate the face of the wave.

Fig. 3. animating DALL·E images[3]

3.1.4 Emerging Simulation Capabilities

Researchers have discovered that video models exhibit several intriguing emergent capabilities when trained at scale. These capabilities allow Sora to simulate various aspects of people, animals, and environments from the physical world. Remarkably, these properties emerge without any explicit inductive biases for 3D or objects; they are purely phenomena of scale. Sora can generate videos with dynamic camera motion, where people and scene elements move consistently through three-dimensional space as the camera shifts and rotates.

[3] https://openai.com/research/video-generation-models-as-world-simulators

3.2 Application of Sora in the Cultural and Tourism Industry

As a novel content creation tool, Sora helps enhance the creative ability, save costs, and improve efficiency in the cultural and tourism industry. It enriches the content and forms of cultural and tourism products, driving industry development and innovation. Although the application of Sora in the cultural and tourism industry is still in its experimental stage, it has already demonstrated tremendous potential.

3.2.1 Application in Tourism Promotion

With Sora, professionals in the cultural and tourism industry can transform textual content such as scenic spot introductions and tourist activities into dynamic videos. By combining textual content with music, images, and video materials, creators generate vivid and interesting tourism promotional videos showcasing scenic views, unique activities, and cultural charm, attracting more attention and participation from tourists. Based on the target audience and market demand, Sora can generate different versions of video content to suit the characteristics of various platforms and media.

3.2.2 Application in Virtual Tours

Some professionals in the cultural and tourism industry are experimenting with using Sora to transform spot introductions and tour information into virtual guided tour videos. These videos can use methods such as panoramic roaming and real-time animation to show users the actual scenes and features of the spots. For example, converting textual information such as the geographical location, historical background, and cultural traditions of spots into virtual guided tour videos immerses users in the charm of the spots, enhancing their tourism experience.

3.2.3 Application in Education and Training

Sora is also used to create educational tourism videos, with specific applications including vocational training in cultural tourism, and cultural and historical education. Tourism companies utilize Sora to generate various sightseeing tour videos, simulating real tour guide scenarios. Guides can familiarize themselves with the historical and cultural background of different sites, optimal tour routes, and techniques for handling unexpected situations. In the field of cultural and historical education, museums can use Sora-generated videos that recreate historical scenes as educational materials, helping audiences, especially students, to better understand and learn about history.

3.3 Challenges and Suggestions

The generation of cultural and tourism artwork using AI tools like Sora also presents some challenges. Firstly, these works may suffer from cultural homogenization and loss of regional characteristics. AI-generated artworks sometimes lack regional characteristics and cultural depth, excessive use of such works may lead to cultural homogenization, weakening the regional characteristics and cultural charm of destina-

tions. Secondly, compared to traditional artworks, AI-generated works may lack emotional connection with users.

To address these issues, we suggest emphasizing regional characteristics and cultural depth in AI-generated artworks, ensuring that the works better reflect local culture and traditions to avoid cultural homogenization. Additionally, improving AI-generated artworks by enhancing user experience and emotional connection.

Through these measures, we can effectively address potential issues with AI-generated artworks in the cultural and tourism industry, promote diversity, regional characteristics, and emotional resonance of artworks, thereby enhancing tourist experiences and industry development levels.

4 Exploring Directions for the Application of AI-generated Art in the Cultural Tourism Industry

With the continuous evolution of AI technology and the improvement of related measures, the future of AI-generated art in the cultural and tourism industry will usher in more innovative applications, opening up broader possibilities.

4.1 Personalized Cultural and Creative Product Development

In the cultural tourism industry, the development and sale of cultural and creative products can bring enormous economic and social benefits to tourist destinations. AI-generated art can create cultural and creative products with unique charm and market competitiveness, and can facilitate personalized development and customized services for cultural and creative products.

4.2 Augmented Reality and Cultural History Reproduction

By combining augmented reality technology and AI-generated art, virtual demonstrations of historical scenes can be realized. Sora can help restore the scenes of ancient buildings and historical events, allowing tourists to better understand history and culture intuitively, thereby enhancing the interest and participation in education. In the future, through virtual reality technology and AI-generated role-playing systems, tourists can interact with historical figures, experiencing the life and culture of historical periods.

4.3 Digital Preservation and Exhibition of Cultural Heritage

Utilizing deep learning algorithms and image recognition technology, AI achieves high-precision digital restoration of ancient paintings, sculptures, architecture, and other cultural heritage items, realizing the digital preservation of cultural heritage. AI can automatically detect and repair damaged parts by analyzing images and data of ancient artifacts, restoring their original appearance and structure. By combining AI-generated art with virtual reality technology, lifelike displays of cultural artifacts

and virtual scenes can be presented to visitors, allowing them to appreciate the details of artifacts up close and promoting the inheritance and protection of cultural heritage.

5 Conclusions

The impact of artificial intelligence on art is profound, with technological advancements and audience participation driving innovation in the field of art. This study, grounded in the broader context of AI development, discusses the applications of AI-generated art across various domains. Using Sora as a typical case of AI-generated art, it delves into the application of AI-generated art in the cultural tourism industry. From the development of personalized cultural and creative products to augmented reality and cultural historical representation, and further to the digital preservation and exhibition of cultural heritage, this research showcases the diverse potential applications of AI-generated art in the cultural tourism industry. These applications not only enhance the tourist experience and attract more visitors but also contribute to the protection and inheritance of cultural heritage, thereby promoting the sustainable development of the cultural tourism industry. This study provides an important reference for future research on the application of AI-generated art in other fields and offers new ideas and methods for the sustainable development of the cultural tourism industry.

References

1. Dosovitskiy, Alexey, et al. "An image is worth 16x16 words: Transformers for image recognition at scale." arXiv preprint arXiv:2010.11929 (2020).
2. Arnab, Anurag, et al. "Vivit: A video vision transformer." Proceedings of the IEEE/CVF international conference on computer vision. 2021.
3. He, Kaiming, et al. "Masked autoencoders are scalable vision learners." Proceedings of the IEEE/CVF conference on computer vision and pattern recognition. 2022.
4. Dehghani, Mostafa, et al. "Patch n'Pack: NaViT, a Vision Transformer for any Aspect Ratio and Resolution." arXiv preprint arXiv:2307.06304 (2023).
5. Betker, James, et al. "Improving image generation with better captions." Computer Science. https://cdn.openai.com/papers/dall-e-3(opens in a new window). pdf 2.3 (2023): 8.
6. Ramesh, Aditya, et al. "Hierarchical text-conditional image generation with clip latents." arXiv preprint arXiv:2204.06125 1.2 (2022): 3.