The Artistic Creation of Cultural Sustainability and Interactive Creativity through Three-Dimensional Animation

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ABSTRACT

In the evolving spectacle of artistic expression, three-dimensional (3D) animation has emerged as an important medium offering dynamic illusions for cultural sustainability and interactive creativity. This article explores the integration of technology and art, particularly focusing on the 3D animation for the Chinese zodiac as new media for traditional cultural symbols which cultivates a sustainable humanistic heritage in a digital age. The CG illustration of this zodiac character utilizes a 3D animation tool namely Blender, which is open-source software for individual artists and micro studios. The interactive 3D animation art is a creative form and theoretical extension of media spectacle. The behaviour of the participants in interactive animation affects the plot and meaning of the artwork. Interaction and interference work mutually in the media spectacle. Concurrently, the rise of Artificial Intelligence in Generative Content (AIGC) introduces a dilemma offering diversity and innovation, while simultaneously challenging established aesthetic norms and disrupting conventional production processes. The anticipated results promise to contribute significantly to the realm of 3D animation art, fostering cross-cultural understanding and interactive communication.

Keywords : media spectacle, open-source tool, interactive art, AIGC, humanistic sustainability, digital zodiac

INTRODUCTION

This article explain the nature of 3D Animation in the artistic Creation of Cultural sustainability and interactive creativity. This article introduces the artistic creation of cultural sustainability and interactive creativity through three-dimensional animation. The research explores the challenges of control and interference with artificial intelligence-generated content (AIGC) with open-source tools and interactive art. The article also introduces some digital illustrations based on the Chinese zodiac, such as the Peaceful Tiger and the Moon Rabbit, and interactive animation, e.g., Dream of Life, Journey to the Modern, and the Quantum Art Gallery, which demonstrate the crossover integration of art and technology through the power of digital media in conveying humanistic creativity and promoting cultural communications.

United Nations adopted the framework of the Sustainable Development Goals (SDGs) in September 2015, the international development agenda mentions culture for the first time (Hosagrahar, 2017, p. 12). This research aims to demonstrate the potential of 3D animation art as a scientific research tool, to broaden the understanding of environmental sustainability and to highlight the importance of the creative arts in promoting sustainable technology. This artistic creation will select an image with a high cultural influence, planning to select the Chinese zodiac and explore digital illustrations to investigate its cultural influence and identity. Then, interactive animation art creation, which has a strong cultural transmission power, will be utilized to demonstrate the cultural communication value and humanistic value of interactive animation art. To further illustrate the diversity of interactive animation art, culture, communication and artistic themes, my artistic creations and typical international artistic creations will be used as case studies to expand the expression and cultural diversity of 3D animation art. This research focuses on the field of 3D animation creation, with an emphasis on cultural sustainability and interactive creativity.

Methodology by Theory with Creation

The study focuses on the impact of digitalisation on sustainability, with a particular emphasis on the Dharma of development, especially in the context of media technology. Matrahah (2019, p. 36) suggests that both arts and sciences involve a ritualistic effort to create and communicate. Drawing from McLuhan's assertion that media serves as an extension of humanity (1964, p. 181), it can be inferred that digital sustainability represents the perpetuation of human cultural heritage. This notion is closely linked with the 'spectacle' concept, which is deeply rooted in interactive media and influences human perception through images and illusions (Buurman, 2005, p. 351; Han, 2017, p. 27). The section concludes with a discussion on "Cultural Sustainability Through Digital Zodiac," further emphasizing the interplay between culture, sustainability, and digital technology.

Digital Sustainability

In the realm of media sustainability, various scholars have explored different aspects and implications. Coles and Pasquier (2015, p. 13) draw parallels between early cave painters and the creative use of contemporary digital media tools, emphasizing the continuity of expression throughout history.

This research investigates the interplay between interactive animation, sustainable development, and digital cultural communication within the digital sustainable ecology. There are 12 Chinese signs, just as there are 12 Western ones, but instead of each sign spanning one month, the Chinese Zodiac Signs cover an entire year. Each year is named after an animal, which represents the characteristics of people born within

12 months. The 12 animals are, in order: Rat, Ox, Tiger, Rabbit, Dragon, Snake, Horse, Sheep, Monkey, Rooster, Dog and Pig.(Moorey, 2012, pp. 114–115) Research into the Chinese zodiac includes the mathematical structure, economic practices, the political discourse of cultural heritage, and the changes in narratives.(Xu & Sharifian, 2018, p. 86) Wang Chong's Lun Heng (80 CE) is noteworthy for being the earliest Chinese source to record the zodiac symbols, which had been developed over several centuries. This work marked the official documentation of the Chinese zodiac, which has since remained unchanged.(Liu, n.d., p. 4)

The Chinese Bestiary is a rich tapestry of mythical creatures and beings, often characterized by the fusion of human and animal elements. This unique blend serves as a cornerstone in character concept design, offering a diverse range of possibilities for visual representation and narrative development. One such example is Nuwa, a significant figure in Chinese mythology known for creating mankind and repairing the heavens. Nuwa is often depicted with a human face and a serpent's body, embodying the integration of human and animal characteristics that is a hallmark of the Chinese Bestiary.

The book "A Chinese Bestiary: Strange Creatures from the Guideways Through Mountains and Seas" is a comprehensive compilation of these fantastical creatures. It provides a detailed account of various mythical beings, their origins, and their significance in Chinese culture and folklore. Furthermore, the "Fantastic Creatures of the Mountains and Seas" is another important work that explores the myriad of creatures inhabiting the mythical spectacles of ancient China. These creatures, each with their unique traits and symbolism, contribute to the rich cultural and artistic diversity of the Chinese Bestiary.

In the realm of 3D animation art, these elements from the Chinese Bestiary can be leveraged to create engaging and culturally resonant content. The fusion of human and animal characteristics not only enhances the visual appeal of the animations but also deepens the cultural communication value of the art. The Chinese Bestiary serves as a valuable resource for interactive animation art creation, offering a wealth of inspiration for artists to explore and incorporate into their work. Its influence extends beyond mere aesthetics, contributing to the cultural sustainability and interactive creativity of 3D animation art. This research aims to further explore this potential, shedding light on the untapped possibilities of the Chinese Bestiary in digital sustainable ecology.

Antique Zodiac artwork, with its diverse artistic expressions and cultural interpretations, serves as a testament to the enduring fascination with celestial bodies and their perceived influence on human life. These artworks, often characterized by the depiction of the 12 zodiac signs, are imbued with rich symbolism and historical significance, reflecting the beliefs, knowledge, and artistic sensibilities of the periods in which they were created. The 12 signs of the zodiac, each associated with specific traits and characteristics, have been a recurring theme in art throughout history. From intricate carvings on ancient temples and detailed illustrations in medieval manuscripts, to ornate designs on Renaissance-era globes and contemporary digital art, the zodiac has been a source of inspiration for artists across different cultures and time periods.

The symbolism inherent in these artworks extends beyond the representation of the zodiac signs. They often incorporate elements of mythology, religion, and cosmology, providing insights into the worldview of the societies that produced them. For instance, the depiction of the zodiac in ancient Egyptian art is intertwined with their gods and

religious beliefs, while in medieval Europe, zodiac symbols were often incorporated into Christian iconography.

The Digital Zodiac, particularly the Chinese Zodiac, represents a modern interpretation of ancient symbols through the lens of digital art. Known as Sheng Xiao or Shu Xiang, the Chinese Zodiac is a 12-year cycle of animal signs with associated attributes, following the lunar calendar. The sequence of the animals is: Rat, Ox, Tiger, Rabbit, Dragon, Snake, Horse, Goat, Monkey, Rooster, Dog, and Pig.

In the digital realm, these zodiac signs are brought to life through a variety of digital art techniques. The resulting digital illustrations often feature vibrant colours, intricate designs, and unique interpretations of each zodiac sign, reflecting the artist's vision and cultural understanding. These digital representations serve not only as artistic expressions but also as cultural artifacts that can be used for educational, cultural, or entertainment purposes across various digital platforms. Digital Zodiac Illustrations offer a fresh perspective on the traditional zodiac symbols. They leverage the capabilities of digital art to enhance the visual appeal and cultural resonance of these symbols. Each illustration is a unique interpretation of the respective zodiac sign, embodying its associated traits and characteristics in a visually compelling manner.

Furthermore, these digital illustrations contribute to the preservation and propagation of cultural heritage in the digital age. They serve as a bridge between the past and the present, combining traditional symbolism with contemporary art techniques. This fusion of the old and the new not only enriches the cultural discourse but also promotes cultural sustainability in the digital era. The Digital Zodiac, with its vibrant and intricate illustrations, represents a significant development in the field of digital art. It exemplifies the potential of digital media to reinterpret traditional symbols in novel and engaging ways. This research aims to further explore this potential, shedding light on the untapped possibilities of the Digital Zodiac in the context of digital sustainable ecology.

In the realm of digital art, the design conception of the Zodiac signs can serve as a rich source of inspiration. Artists can draw upon the symbolic meanings, cultural significance, and aesthetic appeal of the Zodiac signs to create engaging and culturally resonant content. This aligns with the broader goal of promoting cultural sustainability and interactive creativity in the digital age. The design conception of the Zodiac signs, as exemplified by the bronze fountainheads of the Old Summer Palace, namely Yuanmingyuan, was once home to a distinctive collection of 12 bronze fountainheads, each representing an animal from the Chinese Zodiac. These statues were part of a water clock fountain situated in front of the Haiyan tang. Each animal symbolized a two-hour segment of the day, thus covering the entire 24-hour cycle. The design conception of these Zodiac statues is attributed to Jesuit Giuseppe Castiglione, also known as Lang Shining, who was commissioned by the Qianlong Emperor. The statues were designed to spout water from their mouths at specific times, serving as a functional and artistic timekeeping device. Each Zodiac sign carries its own unique set of traits, professions, and temperaments. These characteristics are believed to influence the individual's personality and destiny, adding a layer of personal relevance to the Zodiac signs.

Zodiac culture offers a fascinating integration of art, and science. Its influence extends beyond the realm of art, contributing to our understanding of history, society, and the natural world. This research aims to further explore this potential, shedding light on the untapped possibilities of Chinese Zodiac-inspired design conception in the context of digital sustainable ecology.

3D Animation Creation

The process of creating 3D animations is a multifaceted one, involving several stages such as conceptual design, modelling, rigging, animation, simulation, rendering, motion tracking, compositing, and video editing. Blender, an open-source 3D creation suite, has been the primary tool for this process since 2020.

The "12 Earthly Branches" refer to the Chinese Zodiac system, which comprises 12 animals, each symbolizing a year in the 12-year cycle. The focus here is on the second (Chou) Ox, third (Yin) Tiger, and fourth (Mao) Rabbit.

The Olympic Bull (Figure 1) is a transformation of the traditional zodiac sign of the Year 2021 of the Ox into an Olympic weightlifting champion. The bull, holding a gas mask and lifting a barbell, symbolizes humanity's confidence and determination to overcome the epidemic. Cattle, revered as a totem by many ethnic groups worldwide and seen as a symbol of robustness and strength, have played a significant role in epidemic history. The animation style, created using Blender, aims to infuse the Olympic spirit into the global anti-epidemic action.

Figure 1. Olympic Bull (2021)

The Peace Tiger in 2022 (Figure 2) is part of a series of illustrations created since 2016, based on the Chinese zodiac. The creation process involves creative conception, concept drawing, 3D modelling, character rigging, and lighting rendering. Unlike conventional graphic illustration, 3D digital resources can be easily imported into 3D printing and 3D webpage modelling. The work expresses the need for sufficient peacekeeping strength and courage to defend peace, using cartoon modelling and surrealist techniques.

Figure 2. Peace Tiger (2022)

The Moon Rabbit in 2023 (Figure 3) combines the lunar exploration and space theme with the Mid-Autumn Moon Rabbit shape in traditional art elements. It showcases China's significant aerospace and moon landing achievements while promoting the international spread of Chinese traditional culture using modern cartoon art techniques and three-dimensional visual language. The digital shapes in the CG illustration design are produced using open-source 3D tools, with the creative inspiration drawn from internationally renowned lunar exploration and orbiting projects such as the Chang'e lunar probe, the Yutu lunar rover, the Tiangong Space Station, and Dongfanghong-1. ground aircraft.

Figure 3. Moon Rabbit (2023)

The creation of 3D animations is a complex process involving multiple stages, with Blender being the primary tool used. The Chinese Zodiac system, specifically the Ox, Tiger, and Rabbit, has been creatively represented through various digital illustrations such as the Olympic Bull, Peace Tiger, and Moon Rabbit. These creations not only showcase artistic talent and technical skills but also symbolize significant cultural and societal themes, promoting peace, resilience, and cultural heritage. They demonstrate the power of digital art in conveying profound messages and fostering cultural exchange.

Interactive Creativity
Interactive Creativity is a concept that has evolved from traditional media spectacle to interactive spectacle and now stands as a unique paradigm in the digital age. Media spectacle refers to using media such as television and the Internet to create compelling, dramatic, and attention-grabbing narratives. These spectacles are often designed to entertain, inform, or persuade audiences and are an important part of our cultural spectacle. The term is linked to interactive media (Buurman, 2005, p. 351) which affects human perception and judgment through images and illusions (Han, 2017, p. 27). It is based on different theoretical perspectives from society, media, animation and interaction, with the society of spectacle stemming from Marxism's philosophy and critical theory (Debord, 1970, p. 16; Frayssé, 2019, p. 11; Marx &

Engels, 1887, p. 48). Douglas Kellner's proposition of Media Spectacle focuses on changes in hi-tech culture and the increasingly media-oriented society, particularly technological fetishism and digital alienation (Best & Kellner, 1999, p. 144). It is argued that Debord's analysis of the 'spectacle' is still applicable, and that society has progressed to an 'interactive spectacle' with potential for individual manipulation and empowerment. The interactive spectacle is an evolution of the media spectacle, incorporating elements of interactivity. It allows audiences not only to passively consume content but also to participate in its creation, interpretation, and distribution actively. This shift has been facilitated by advances in technology, particularly the rise of social media platforms and interactive digital media.

Interactive creativity takes this concept one step further. It is not just about consuming or interacting with media content, but about using these interactions to foster creativity. In this paradigm, every interaction, every click, every share, every comment becomes a potential spark for creative ideas. The audience is not just a consumer or participant, but a co-creator. Interactive Creativity recognises the potential of digital platforms as spaces for collaborative creativity. It recognises that creativity is not a solitary endeavour, but a process that can be enriched through interaction. It harnesses the power of digital tools to facilitate this interaction, breaking down barriers and democratising the creative process. Interactive Creativity represents a new frontier in the digital age, offering exciting opportunities for collaborative creation and innovation. It challenges us to rethink our roles as consumers and creators of media and invites us to participate in shaping our cultural narratives. As we navigate this spectacle, we are limited only by our imagination and our willingness to engage with the world around us. Interactive creativity represents a new frontier in the digital age, offering exciting opportunities for collaborative creation and innovation. It challenges us to rethink our roles as consumers and creators of media and invites us to participate in shaping our cultural narratives. As we navigate this spectacle, we are limited only by our imagination and our willingness to engage with the world around us.

The influence of digital technology on sustainability is a complex topic that involves various pros and cons. On a positive note, the convergence of digital and multimodal cognitive technologies enables new forms of cultural interaction, facilitating the representation of thoughts, emotions, and beliefs (Bruni, 2015, p. 103).

Dream of Life was created in 2006. The Chinese name of this work is "Thought Fragments"（Figure 4）, which is my early attempt at interactive animation. The work uses Flash action script to allow the audience's behaviour on the scene to become the event-triggering factor that controls the short video. This work uses a surreal and absurd technique. The visual elements in this work are composed of three-dimensional renderings and real shots with effects. Different visual symbol elements are combined and reconstructed to express the fragmented perceptions and impressions of human thinking and cognition in the information age. Deconstruction and reconstruction.

When Flash became popular worldwide and was introduced to China in the early 21st century, a normal perception was that Flash was 2D animation or dynamic web pages. The Chinese animation fans called Flash creators "Flashers." But in fact, Flash's contribution to animation art lies in interactivity. Outstanding representatives in the field of Flash interactive animation include Dutch artist Han Hoogerbrugge and China's Wang Bo (screen name Pi San).

The rise and fall of Flash art is also closely related to the replacement of technology. In 2010, Apple's then-President Steve Jobs's evaluation of Flash had a profound impact. According to statistics from Statista, Flash's website share dropped from 28.5% to 2.2% from 2011 to 2021, declaring that the era of two-dimensional interactive

animation represented by Flash is over, and 3D interactive engines represented by Unity are gradually becoming mainstream.

Figure 4. Dream of Life (2006)

Journey to the Modern

Journey to the Modern（Figure 5） was created in 2016, using classic Journey to the West characters to show the living conditions of modern urbanites through the interactive tool namely Unity 3D. "Journey to the West" is a Chinese novel published in the Ming Dynasty in the 16th century. It is based on the legendary experience of Hsuan-Tsang, a monk in the Tang Dynasty, who went to the "Western Regions" (Central Asia and India) to learn Buddhist scriptures and returned after going through untold hardships. Journey to the Modern, the characters draw inspiration from the shapes of Monk Tang, Monkey King, Friar Sand, and Pigsy, and are given new-era occupations based on their personalities, showing the state of modern urbanites under

the pressure of urban development and survival. It is a culturally sustainable attempt to the classic characters in Chinese ancient literature.

The creative form was originally a CG illustration, which was fixed on the "decision moment" of the "modern version" of Journey to the West when masters and apprentices clocked in for work. Unity3D and WebGL technologies were then used to create a gamified web interactive animation, where players can interact in a variety of narrative nodes.

Figure 5. Journey to the Modern (2016)

Quantum Art Gallery

In terms of media ecology, this research investigated 'The Quantum Art Gallery' in 2023. Quantum art (Lioret, 2016, p. 135) combines art with science by drawing inspiration from quantum physics principles for creative expression. Drawing inspiration from quantum art's characteristic uncertainty and interference, an interactive context and artistic shape for this questionnaire will offer participants insight into media's effect on participant's behaviors. By collecting interaction and interference data using an interaction engine and MySQL database, this research seeks not only to investigate how media art has been altered by advances in media technology using Media-tech soil as an analytical framework but also make contributions in interactive technology assessment by creating an innovative questionnaire combining elements of humanistic engagement with artistic expression and artistic freedom. By employing 3D digital resources, online platforms, quantum art principles as well as quantum computing principles this study strives to offer a complete picture of how individuals engage with interactive technology and its components. This study's primary research aim will be to create and deploy an interactive questionnaire as an assessment tool of human engagement with interactive technologies. Unfortunately, traditional survey methods currently in use don't accommodate interactive elements that reflect academic analysis and examination of objective behavioral data. This questionnaire on interaction consisted of both an animated questionnaire and regular Likert scale questions to offer a more complete assessment of how individuals engage with interactive technology. Research will focus on improving interactive animation art production by measuring and optimizing 3D digital resources used. An online compatibility test will also be run to ensure seamless interaction with animations; and finally, a questionnaire will be implemented to assess participants' knowledge about interactive animation.
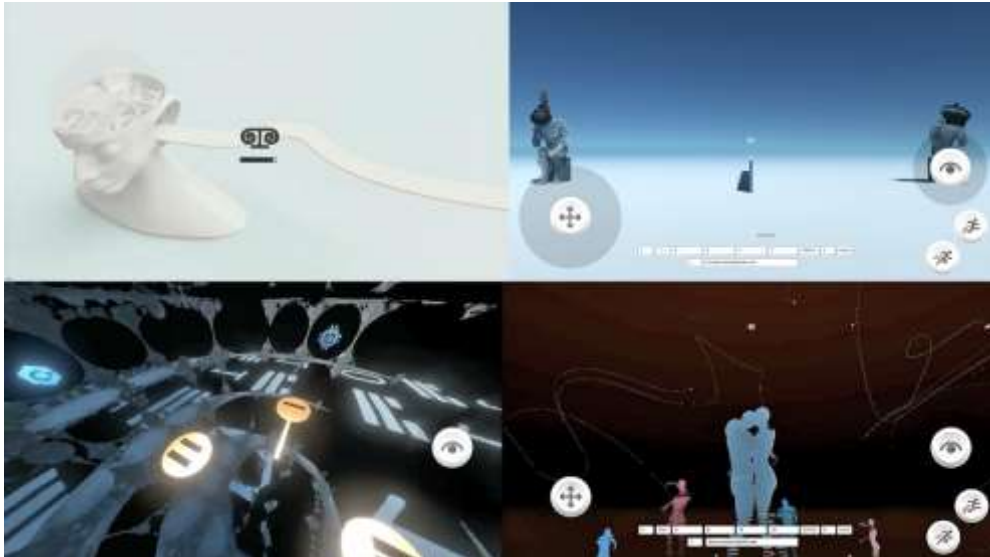
Figure 6. Quantum Art Gallery (2023)

Furthermore, this study contributes to the field of media ecology by exploring the concept of 'The Quantum Art Gallery' and its relationship to media interference. Drawing inspiration from quantum art, which combines principles from quantum physics and artistic expression, the interactive context and artistic shape in the questionnaire provide insight into the influence of media interference on participants' behaviour.
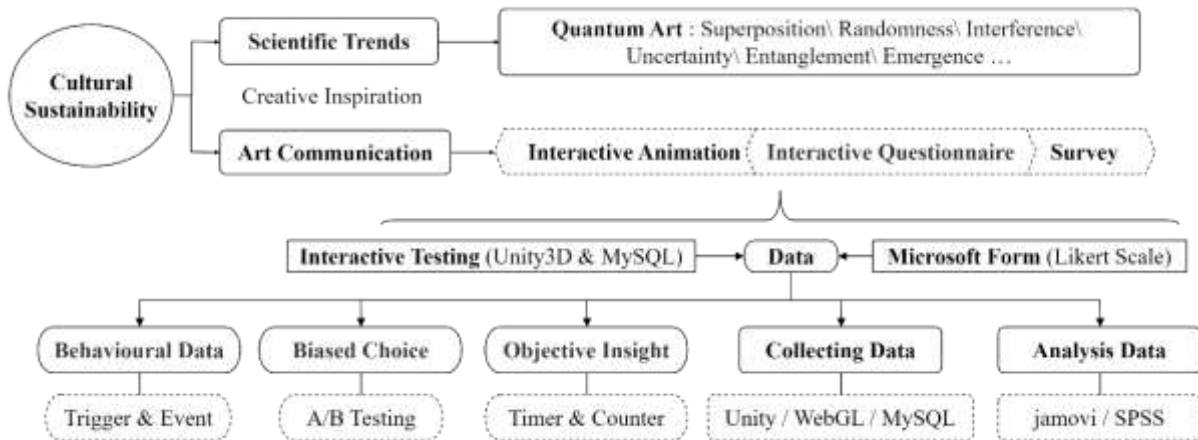

Figure 7. Framework of Interactive Questionnaire

AIGC Challenge

In 2009, I joked with my colleagues in the 3D animation industry that maybe in coming future, 3D animation will be automated and intelligent, and animation can be produced by just saying the word "animate". It became a prophecy, and it emerged in 2022 In the field of automatic graphics generation of AIGC, magic animation can be generated with simple "keywords".

Traditional 3D technology often requires manual modeling or purchasing resource libraries for digital models or assets in fields such as illustration, animation, and gaming. However, with the emergence of AIGC in 2022, the production threshold for 3D digital content has been lowered.

AI-generated content (AIGC) presents a considerable challenge to established aesthetic norms and conventional production processes. AIGC uses generative large AI algorithms to assist or replace humans in creating massive, high-quality, and human-like content at a faster pace and lower cost. This has led to a shift in the creative process, challenging traditional methods and aesthetics.

Norm and Disrupting

AI-generated content now is challenging established aesthetic norms and disrupting conventional production processes. Different from open-source technology, AIGC challenges existing aesthetic standards, especially the originality of content copyright. Since AIGC conducts big data learning and builds models on shapes and styles, the aesthetic level of its content sources varies. together. In addition, AIGC is premised on the supply of huge amounts of data, and the data provided inevitably includes content protected by copyright.

AIGC has also had an impact on the animation production process. On AI image generation platforms such as Midjourney, DALL-E, and Stability AI, digital images can be generated with just one text command, eliminating the need for hand-drawn concept drawings, modelling, binding actions, and lighting. and other processes, simplifying the animation generation steps. The process of obtaining intelligent images based on graphics card memory is to imitate the visual imaging mechanism of the human brain, a process from vague impressions to concrete shapes. This is just like the proverb "The laws of illusion creation originate from invisible chaos" in Tao Te Ching (Moral Scripture) written by philosopher Lao Tzu.

The digital images and synthetic characters composed of AIGC have reached a high level of authenticity, and fake videos and highly imitated characters have brought cognitive confusion to the public. In the ancient Chinese Literature "Strategies of the Warring States", an Idiom namely three people make tigers (Whisper Game). Three people in a row claiming that there are tigers on the street make people believe that there are indeed tigers on the street. The metaphor is that repeated rumours can still make people believe it is true. If the number of images and illusions synthesized by AIGC that disturb the public reaches a certain level, that can be said to be a representation of the metaverse and a challenge to cultural sustainability caused by media interference.

Digital 3D vs. AIGC 3D

Digital 3D and AIGC 3D (AI Generated Content) are two different approaches to creating 3D content. Here's a comparison based on the parameters from duration, difficulty, controllability, vividness, and volume.

Duration: Digital 3D content creation is often time-consuming as it requires manual effort. On the other hand, AIGC 3D can generate content more quickly as it leverages AI algorithms. In actual creative practice, although AIGC can quickly generate concept drafts of multiple plans, its uncertainty brings instability factors to the later and detailed processing. The final shot always misses, and later adjustments will also It's a waste of time, and you even have no control over the picture.

Difficulty: Digital 3D requires knowledge of specific software and artistic skills. AIGC 3D, while requiring an understanding of AI models and algorithms, can automate much of the process, making it potentially less difficult. Digital 3D digitizes traditional paintings, sculptures, and photography. It is more friendly to artists, but it has a threshold of artistic level for the public. Although AIGC 3D at the current stage has lowered the threshold, its generation logic is based on large models rather than

traditional modelling processes, or perhaps, the degree of intelligent integration with classic three-dimensional processes needs to be improved.

Controllability: Both methods offer control but in different ways. In Digital 3D, the artist has direct control over the creation process. In AIGC 3D, control is exerted through the parameters and data fed into the AI model.

When inferring a digital model from an image, the model is often composed of point clouds with a large amount of data and does not have a very reasonable and remeshed topological structure.

Vividness: AIGC 3D has made remarkable progress in generating rich and diverse content, including text-guided 3D avatar generation, texture generation, scene generation, and shape transformation. Digital 3D also allows for rich content creation, but the richness largely depends on the skill and creativity of the artist.

Both Digital 3D and AIGC 3D can produce vivid and detailed content. The richness of AIGC 3D content can depend on the complexity of the AI model and the quality of the input data. Digital 3D utilized translated 2D animation principles, such as Disney and Pixar-style action design, to make Digital 3D animation more vivid and art expressive.

Volume: It's important to note that the 'volume' in this context does not only necessarily refer to the physical size of the models, but rather the amount of data they contain. We can analyse from another perspective about the volume of 3D content in terms of both quality and quantity. AIGC 3D has the potential to generate a large volume of content quickly, as it can create new content based on the input data and parameters Digital 3D content, excluding scanned point cloud models, whose creation is typically a manual process, is modelled with a reasonable structure and topology. In AIGC 3D, the models are often generated to point clouds, which can result in a large volume of data., the points with their own set of coordinates lead to highly detailed models, but also a large amount of data. On the other hand, Digital 3D models are often more remeshed and optimized which is just like structural sketching in painting. They are typically created with a focus on maintaining a balance between detail of topography and efficiency, which often results in a smaller data volume.

Table 1. Digital 3D vs. AIGC 3D

Parameter	Digital 3D	AIGC 3D
Duration	Slow, manual	Fast, AI-assisted
Difficulty	Software & artistic skills	Automates process
Controllability	Direct control	Via morpheme
Vividness	Artist's skill & creativity	AI model & input data
Volume	Optimized models, smaller	Point clouds, larger

In the process of creating the CG illustration "Moon Rabbit" that I made at the end of 2023, I tried to use the AIGC tool to generate digital sketches in the early stage and used language descriptions to strengthen and improve the ideas in my mind. For example, enter the morpheme "Rabbit on the Moon Chang 'e lunar rover Rabbit astronaut On the moon The Tiangong space station with the Earth in the background" in Midjourney or Alibaba Cloud's generative AI model Tongyi Wanxiang (Universal illusions) creates images by the morpheme "The Chang 'e lunar probe vehicle driven by the Rabbit astronaut, the rabbit astronaut stands next to the Chang 'e lunar probe vehicle, with the Tiangong space station on the moon in the background of the large view of Earth". In terms of the rigour of styling and the richness of details, Midjourney's

creativity is even more excellent.   So, while AIGC 3D models might have a larger data volume due to their point cloud nature, Digital 3D models might offer a more optimized and efficient use of data. Both methods have their advantages and drawbacks when it comes to the volume of data.   At this stage, AIGC is more suitable as a quick preview of concept drawings for 3D animations, but it is still far from being an effective digital asset.

CONCLUSION

The "Spectacle Dilemma" refers to the challenges that AI-generated content (AIGC) faces in terms of control and interference. While AIGC is revolutionary, it lacks control and is full of interference. This is primarily due to the nature of AI, which learns from vast amounts of data and generates content based on the patterns it identifies. However, these patterns may not always match human expectations or intentions, leading to a lack of control. Interference comes into play when considering the data used to train these AI models. The data provided will inevitably contain copyrighted content, raising potential legal and ethical issues. In addition, the aesthetic level of the content sources varies, which can lead to inconsistencies in the generated content.

Regulators are aware of these challenges. For example, the Cyberspace Administration of China (CAC) issued the Interim Measures for the Management of Generative Artificial Intelligence Services (the "AIGC Measures") on 13 July 2023. These measures aim to provide clearer guidance to the AI and algorithm-related industries about the current regulatory spectacle. The AIGC Measures emphasize the principles of balancing technological advancement with safety measures and fostering innovation within a lawful regulatory framework. They also provide a degree of flexibility for providers to meet their compliance obligations. While the AIGC has made significant progress, it still faces challenges in terms of control and interference. Addressing these challenges will require a combination of technological advances, regulatory measures, and ethical considerations. It's a complex issue that will continue to evolve as AI technology advances.

One of the most important propositions in my research of "Media Spectacle & Crossover Integration: Artistic Creation and Cultural Meditation in Contemporary Interactive Animation" refers to the characteristic of interactive animation as "No interaction without interference".

The spectacle of media, particularly in the context of 3D technology and art, is a manifestation of the complex relationship between art and technology. Art has its roots in technology, while technology simultaneously influences and interferes with media.

Three-dimensional or interactive animation is a specific kind of media spectacle. It is deeply embedded in interactive technology and reflects our humanistic heritage. Its primary characteristics are interaction and interference.

The concept of "artistic creation of cultural sustainability and interactive creativity through three-dimensional animation" refers to the digital sustainability of the media spectacle. This concept is crucial for the sustainable development of media ecology. It bridges the gap between real and virtual ecosystems and helps to preserve the memories of past and future civilizations.

Media technology and artistic creativity serve as important focal points in contemporary digital media design. Interactive animation has emerged as a new interdisciplinary research area, further emphasizing the importance of these elements. This development underlines the dynamic and evolving nature of the ecology of 3D animation.

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Appendix
Monograph on interactive 3D animation by author:
"Interactive Animation Design: Integration of Zbrush+Autodesk+Unity+Kinect+Arduino 3D Motion Sensing Technology " (ISBN: 978-7-122-25850-2, Chemical Industry Press) Feb 2016.
https://www.researchgate.net/publication/356193533_Interactive_Animation_Design_ZbrushAutodeskUnityKinectArduino_3D_Somatosensory_Technology_Integration
"New Media Cross-border Interaction Design" (ISBN: 9787302475446, Tsinghua University Press) Oct 2017.

https://www.researchgate.net/publication/356193622_New_Media_Crossover_Interaction_Design

Website of the interactive 3D animation by author:
http://www.balancerstudio.cc/