

# Research on the application of immersive art in digital technology scene

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**Abstract.** In the context of the continuous growth of data information, the arrival of the digital age has not only changed People's Daily life, but also had a profound impact on the development of the art field. There is a complex and changeable integration relationship between science and technology and art and culture. Technology aestheticization and art technicalization have become one of the most important features of the development of the new era. The most representative one is the development of immersive art technology, which, as the key of mood art emerging in the current market, has developed rapidly with the help of the theory of digital technology. On the basis of understanding the development status of digital technology and immersive art, this paper deeply discusses the application advantages of immersive art in the construction and development of modern society according to the common technological means of immersive art in the current market.

**Keywords:** Digital technology; Immersive; Art; 5G technology.

## 1. Introduction

From the perspective of international development, immersive art has been applied more and more widely, with more and more overall development modes. It can make full use of digital technology, sound, photoelectric and other elements to create immersive art scenes for social residents and bring them immersive art experience. This digital technology as the core of the art field, not only allows the audience to produce a new sensory experience, but also promotes the interactive nature of the art model. For example, Japanese artist Yayoi Kusama exhibited a series of immersive works at the Museum of Contemporary Art in Shanghai in 2013. Among them, the creator of "Infinity House" created a dreamlike art world for visitors by reflecting points of light and accumulated sculptures in a closed space through a mirror. Combining the traditional painting Along the River during Qingming Festival, the Palace Museum presents visitors with a high-tech interactive exhibition named "Along the River during Qingming Festival 3.0". The exhibition uses a variety of high-tech interactive technologies, such as 4D dynamic image and 8K ultra-high-definition digital technology, which can highly restore the cultural features of the Northern Song Dynasty. It can also present immersive experience activities for the audience. From the perspective of overall development, the development of immersive art has gradually changed people's original art appreciation way and thinking concept, which has broad development space in the future technological innovation and development.[1-3]

However, the development of immersive art has also attracted questions and concerns from all walks of life. Some scholars believe that immersive art will dissolve the original seriousness of art, lead the field of art to the direction of commercialization and entertainment, gradually lose the character of art itself, and become a pastime game for the public. According to the research and application situation of immersion art technology in recent years, there are few theoretical literatures, and new features and problems of overall development lack comprehensive study. Therefore, when promoting immersion art technology system, we should pay attention to combining the case study analysis and guarantee the common development of theoretical knowledge and application technology. In essence, the core of immersive art is immersion. By creating immersive sensory experience for the viewer from the art scene, the aesthetic subject can change from a mind-oriented view to a body-oriented view, which can not only show the advantages of new media art, but also solve the development problems of traditional art.[4-6]

The theory of immersion art was studied earlier in foreign countries, which involved psychology, art history, technology research, literature theory and many other aspects. For example, in the mid-1970s, psychologists first proposed the basic theory of "flow experience". They believe that it is a feeling that an individual puts all his body and mind into something, which will make people feel highly excited. Immersion in experience activities can make people forget the real world, so as to generate flow. In the early 21st century, art historians made a deep overview of the two concepts of illusion and immersion, taking the history of western image development and art development as the main clues, rethinking the function of image and painting method according to the art works currently mastered, and conducting a comparative study with the current new media art, so as to continuously expand the research vision of virtual art. In the 1980s, the American science fiction scientist and the father of cyberpunk movement first put forward the concept of cyberspace, which includes the correlation analysis between virtual reality and the calm feeling in cyberspace, which provides an effective basis for the research on the aesthetic and technical characteristics of new media art. However, there are not many research literatures on digital era immersive art experience by Chinese scholars, which can be reflected in the following points: First, from the perspective of aesthetic art, some scholars deeply explore the content of technology revolution, Turing test and cyberspace from the new media, and focus on the analysis of mixed reality, augmented reality, virtual reality and other technical theories; Secondly, from the perspective of communication, some scholars regard virtual reality technology as a brand new mode of communication and communication tool, and conduct all-round exploration of the development trend in the era of new media. Third, from the perspective of application in different categories, immersive experience technology has been widely used in exhibition activities, animation, movie theater and other aspects, which has a profound impact on audience's viewing psychology and the narrative mode of the film itself. Therefore, on the basis of understanding the development status of immersive art, this paper mainly explores the application direction and main content of digital technology scene in the new era, and then combines practical cases to judge and analyze the development advantages of immersive art with digital technology as the core.

## 2. Methods

### 2.1 Display Space

In a new media environment, the immersive display space reconstructs the visitor's perceptual pattern, allowing people to participate and interact with it. Compared with traditional exhibition design forms, digital technology-centered immersive art exhibition space plays a unique role in communication. On the one hand, it can fill the information gap of traditional exhibition space, store a large amount of information data, and accelerate the updating and iteration of exhibition art content. On the other hand, it can create a multi-sensory immersive experience environment and form a good interactive experience cognition. The present display space characteristics are shown in Table 1:[7-9]

Table 1 Characteristics analysis of various display Spaces

Project	Characteristics of traditional exhibition space	Spatial characteristics of digital display
Display content	Physical exhibits, sculptures, pictures and texts	Installation art, dynamic influence, etc.
Performance streamline	Fixed invariant	Flexibility and freedom
Display technology	Low technology	AR, VR, MR, 5G, Holographic projection, etc
How the audience accepts information.	Passive acceptance	Take the initiative
mode of transmission	Unidirectional propagation	Two-way communication
Experience mode	Visual experience	Multi-sensory experience

Utilization of environmental resources	consume	save
designer	Authority (artist)	Participants (audience)
the spread of information	limited	extensive

Based on the above analysis, it can be seen that the display space with digital technology as the core is regarded as an effective channel to spread cultural information, which can not only present rich and interesting information resources to the public, but also help them better understand the display content. From the perspective of the characteristics of digital display space, it pays more attention to the flexible and free display to people, and lays more emphasis on the fundamental needs and role positioning of audiences. Combined with the theoretical analysis of media environment, it can be seen that the immersive art experience activities with digital technology as the core can meet the common demands of the social public for culture and spirit. Therefore, it is necessary to build an exhibition hall with humanistic care. That resonates with their emotions and gets them engaged.

For example, the size of the physical space will affect the audience's immersion in art, so the following methods can be chosen to weaken the space: First, reduce the environmental illumination, so that visitors' visual focus is mainly concentrated in the light range of information transmission; Secondly, shorten the space scene boundary and design the arc space structure, as shown in Figure 1 below. Since it is not easy to connect the electronic screen and the projection in the angular space, it is not conducive to the representation of real information in the virtual content. The curved interface reflects the light source evenly, so the color and brightness of the presented picture will not be affected, and the information content can be displayed more intuitively to the audience. Therefore, when creating immersive art experience activities, the curved space form should be preferred.[10-13]

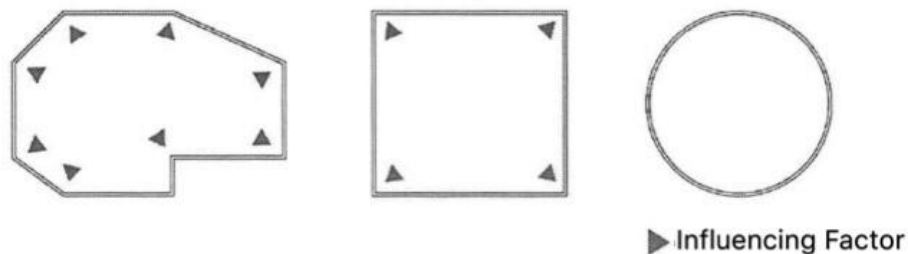


FIG. 1 Design of arc-shaped space structure

Finally, the exhibition space is considered in the environmental design to ensure the coordination and compatibility between the exhibition space and the architectural space, so as to truly meet the audience's immersive experience needs.

## 2.2 VR Integration

After entering the 5G era, market information dissemination has undergone qualitative changes. How to use virtual reality technology to present immersive art activities to users in an all-round way and make them feel immersed in the scene is the main issue of current scientific research. As the latest generation of cellular mobile communication technology, 5G technology is faster than 4G technology, with data transmission speeds of up to 10 gigabits per second, and can reduce energy costs, improve system storage capacity and large-scale device connectivity. From the perspective of the development of immersive art, the integration of 5G technology and VR technology should take the audience as the core basis, integrate and study the application performance of existing technical equipment, as shown in Table 2 below, and then ensure that the technical equipment can fully cover the human sensory system, so that users can receive artistic information from the first perspective.[14-15]

Table 2 Performance analysis of existing VR equipment

computer module	data transmission	Display scheme	positioning system	name
PC	wired	Screen light package	6Dof	PCVR
android	Integrated built-in	Screen light package	3Dof	virtual reality all in one headset
Unlimited	wired	Screen light package	3Dof	Vr glasses
		mobile phone screen	Mobile phone 3Dof	VR box
			NOLO6Dof	NOLO positioning set
Unlimited	Unlimited	Optical packet screen	without	Toudai cinema

### 3. Result analysis

After clarifying the application direction of immersive art with digital technology as the core, this paper takes Tianquan as an example and integrates H5 experience and interaction technology to present this story to the public in the form of animation, so that they can listen to the natural sounds of the mountains while watching panoramic photos and text images, so as to have the feeling of being there. As one of the traditional Chinese comic books, Tianqu organically combines plastic arts and literary arts, featuring readability of plot, liveliness of characters and integration of text, text and information.

HTML5, short for H5, can produce and disseminate multimedia content on mobile devices and multiple platforms. It not only integrates text, image, audio, video and other audio-visual elements, but also guides the public to participate actively according to its own interaction. In accordance with the technical process shown in Figure 2 below, an immersive virtual space is created from the visual and auditory aspects. On the one hand, readers can obtain strong reading continuity, on the other hand, they can get rid of the traditional static presentation mode, so that the color of the picture and some objects can change with the eyes and movements of the audience, so as to present dynamic presentation effect.

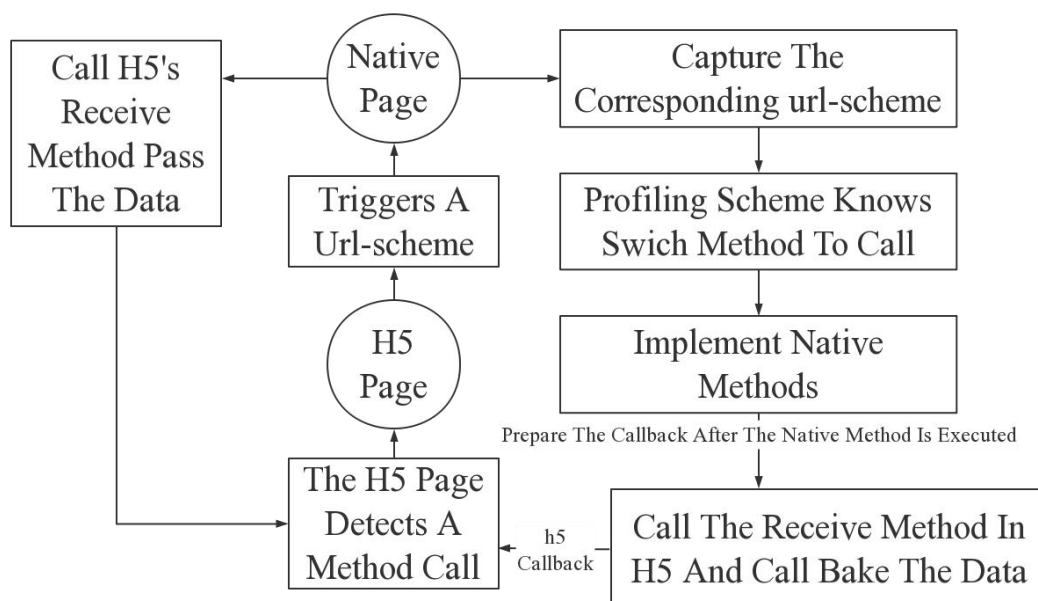


Figure 2. Flow chart of H5 experience interaction technology

At the same time, virtual reality technology is combined to build the system platform as shown in Figure 3 below, and the web form of waterfall flow is integrated and used, so that each picture is seamless. It can not only skillfully use the difference between visual elements, so that the audience's sight can follow the changes, but also create a relaxed and pleasant viewing environment. From the perspective of practical application, in the development of immersive art field, the digital technology theory proposed in the new era is integrated and applied. Each technology method has advantages and disadvantages. Therefore, developers and designers can integrate various methods to maximize the application performance and user experience, and ensure that the audience can feel the continuity of information when appreciating. The viewing experience will not be affected by content errors or frequent operations. At the same time, the background music and sound effects are slowly controlled according to the picture changes, which can bring a new audio-visual experience to the audience.

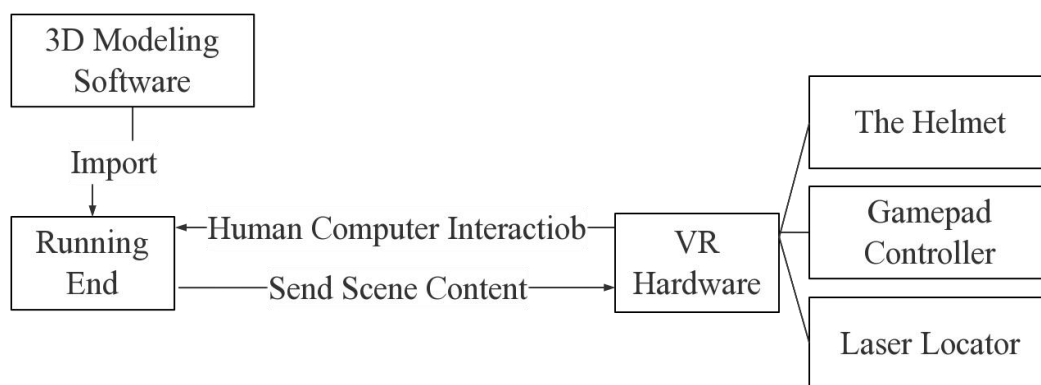


Figure 3 Platform structure of immersive art system

#### 4. Conclusion

To sum up, the development of digital technology has accelerated the pace of immersive art innovation and provided technical support for artistic creation and literary appreciation in the new era. Therefore, Chinese scholars should start from the perspective of the development of artistic creation, according to the many characteristics of the development of immersive art, integrate the use of virtual reality, augmented reality, mixed reality and other modern technologies, to build a virtual art space consistent with the needs of social residents, gradually break the traditional development mode of one-way communication, and at the same time, according to practical research problems, Deep thinking how to use the digital technology scene to promote the healthy development of immersive art. Under the development trend of economic globalization, immersive art is facing more opportunities and challenges. Therefore, while strengthening the research on the concept of immersive art and the theory of digital technology, we should actively cultivate outstanding talents in the industry, scientifically coordinate various factors affecting the development of art, and build and develop humanistic and interesting new media art. In order to improve the aesthetic ability of social residents.

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