# The Use of Digital Multimedia Technology in Public Space Art

1st Chi Sun[1], 2nd Naiqi Wang[2]

{sunchi1962@vip.sina.com[1], 2509860614@qq.com[2]}

Shenyang University of Architecture, Shen Yang, Liao Ning, China

**Abstract.** With the rapid development of information technology, digital multimedia technology has been applied to many industries, and digital technology has changed people's daily life and leisure methods. This paper explores the application of digital multimedia technology in urban public space art to provide new ideas for the interactive integration of technology and art.

**Keywords:** digital multimedia technology, public space art, interaction

## 1    Introduction

Information is everywhere in today's world and digital multimedia technology, as a discipline based on the integration of computer technology, network technology and culture, business and art, has changed the way we live. This new art form is based on digital technology and communication technology, merging our rational thinking and artistic sensibility into a new art form.[1] In a broader sense, all artistic practices and works that use digital technology can be referred to as digital multimedia art. Public space artworks are also brought to life by this integration of digital technology. The 'borderless' integration of digital multimedia technology not only adds to people's sensory experience, but also makes conventional artworks more creative. In the context of the fusion of virtual reality and reality, a variety of composite and diverse new media are emerging.This cross-media approach to development, driven by digital technology and the intersection and synergy of new media, has emerged.

## 2    Overview of public space art

Art in public space is defined more broadly than art in galleries or exhibition halls. Traditionally, art in public space refers to all artworks created by artists in public space. There are two central conditions that define the need for the existence of public space: public space and public participation. Art in public space conveys a number of messages for people, including the city's regional culture, folklore and local customs, as well as the functional structure, expression and style, symbolic content and beliefs of the works themselves.

The impact of public space art on cities is of great economic and cultural value. It can be sculpture, installation, murals or even other audiovisual art such as 3D holographic projections, performance art, projection art, multimedia video art or even avant-garde experimental art,

which is growing and changing with the times . Excellent public space construction reflects the good appearance of a city and regional culture, and creates a good public environment while enhancing cultural confidence.

## 3 Advantages of digital multimedia technology in the development of public space art

As some scholars say, "With the dailyization, socialization and pluralization of media and the awakening of audience self-awareness, anything can become a new media,and the awakening of the audience's self-awareness, anything can become a new media art, and the public's independent participation in art creation and meaning generation has become an inherent demand for cultural experience.We summarize this phenomenon as the public nature of new media art."[2]

In recent years, with the increasing pace of urbanisation in China and the rapid growth of civic awareness, public space art has gained public interest and attention in China. With its rich, diverse and creative art forms, public space art has enlivened the cultural environment of China's urban spaces. The addition of digital multimedia technology can not only increase the richness of spatial art, but also extend the forms of spatial art. The 'border less' use of digital media has also become a key factor in improving the quality of art in public spaces. The main body of public space art needs to use the public space art in which it is located to communicate with the public, and the public in turn wants to participate in public space art in order to express their perception and evaluation of the artwork.

However, at present, all public space art in China remains in the physical space where the public space artwork is located and the effect and influence it has on the public in the area, and the degree of audience participation is still far from adequate. The more participatory a public space work is in relation to the people around it, the higher the level at which the work portrays the spirit of the people and the quality of the city. In this context, the integration of public space art with digital technology is particularly important. From a digital perspective, the development of digital multimedia technology has broken through the original relatively single space, increasing communication between people, and these interactions are not limited in time or place, and interactive installations need to reflect the innovation of artistic expression and aesthetic application.[3](Figure 1)



**Fig.1.** Example figureDigital multimedia design direction from the perspective of public space design

# 4 Ways of integrating digital technology into public space

## 4.1 Enhancing practicality and creating everyday art

Art in public space symbolises the universal public culture of a society and is closely related to the daily leisure activities of people from all walks of life, so it is necessary to deepen the design of art installations and the environment in which they are located from the perspective of social practicality. In the early stages of the design process, the behavioural habits, lifestyles and behaviours of the local people should be taken into account, and the functional requirements of the interactive installation, including social interaction, living services and social functions, should be set according to the needs. Then, in the design of the scheme, the social function perspective is used to create a positive impact on the social ecological environment, so as to effectively provide support, guidance and cohesion for people's lives. In addition to satisfying the function, the design further reflects the characteristics of humanistic care, fun and artistic expression. Public space art carries the function of aesthetic education, and interactive installations need to reflect innovative artistic expression and aesthetic application, providing more aesthetic scenes for different groups to experience.[4]

## 4.2 Focus on public interaction and interesting venues

The pursuit of more intimate, interactive and stimulating interactive feelings is always the audience's inner subconscious, so the basic value of public space art is to be able to use its artistic expression in public facilities, buildings and landscapes to highlight the fun, extensibility and inclusiveness of public space, so that the surrounding public can feel a positive living environment through common activities and dialogue and communication.[5]

## 4.3 Create a sense of place and focus on cultural heritage

"Sense of place" and "locality" have been the new focus of China's urban transformation and urbanisation in recent years, and the real implementation of public space art needs to be more sustainable than fleeting beauty.[6] Designers should therefore consider how to express the historical mark of a public space through interactive installations, in order to express the unique historical and cultural atmosphere of the public space, in accordance with the needs of the public and the development trend of public space art. The use of interactive devices is an innovative way of portraying the historical heritage of the space, conveying the value of the local history and enhancing the sense of belonging to the site. Through interactive devices, the events of the area are told, and the unique mark of the site is reinforced by the intersection of art and technology.

# 5 The application of digital multimedia technology in public space art

The development of new media technologies, especially the widespread use of digital technology, has revolutionised the way humans communicate. Digital media technology combines artistic and technological methods, and its applications include music, art and design, computer programming, film and television, and many more. [7]The use of digital technology

allows for the diversification and flexibility of art design and the application of digital art in the field of public space art.

## 5.1 Interactive installations

Diverse and cross-media works can attract public attention while at the same time generating interaction, thus allowing the viewer to become more involved in social activities.Human vision is the intuitive feeling of things, space is also, people getting along in a space vision is the first to measure the spatial environment, including materials, colors, dimensions and many other elements.material, color and size and so on. The connection between installation and space is by the designer through the combination of things and space to produce interaction, so that the user better feel the design and the designer to produce emotional resonance. Zadar, Croatia, is famous for its beautiful sunsets. Since 2005, the Zadar coast has received a great deal of attention from the outside world, and in the design of the coastal renovation at that time, architect Nikola Bašić made acoustic improvements to the beach structure - he designed the unprecedented "Sea Organ"(Figure 2). The pipes are positioned so that the musical sounds generated by the movement of the sea and the wind are heard by distant pedestrians, like the natural chanting of the distant shore, and the sound diffusion promotes a high degree of unity between the building and the natural environment. One can easily approach the sea and touch it. The 'performer' is nature itself. [8]
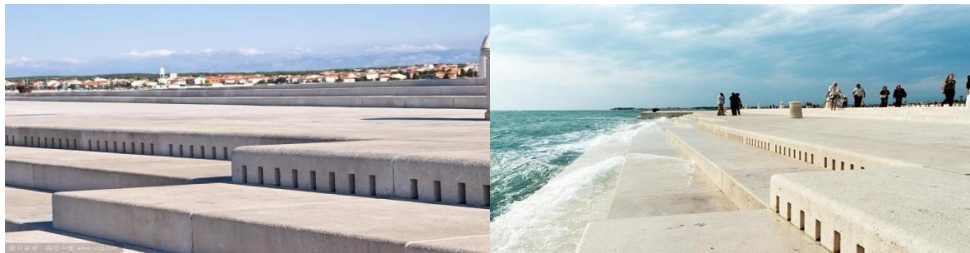


**Fig.2.**The Sea Organ

## 5.2 Digital light installations

Light installations are artistic creations that use sound, light and electricity to create a spatial environment(Figure 3). It takes artificial light as the main medium and creates the overall atmosphere according to the intensity, colour and movement of the changing light. The light and shadows and shades created by the light can not only form the main body of the design alone, but can also be combined with other forms of art, such as sculpture or architecture. But whatever the form of expression, the key medium is 'light'. Light installations are works of art that incorporate modern technology, using sound and light to create audio-visual and interactive works of art in certain contexts. As some experts and scholars have concluded, this is a comprehensive work of art in which "light + material + space + emotion" is used. [9]
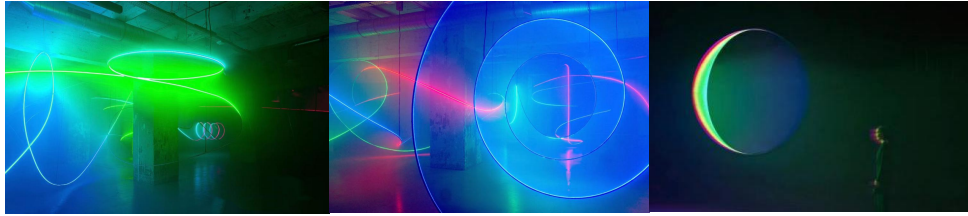
**Fig. 3.**The Application of Digital Lighting Installation artwork in Public Space

### 5.3 Projection technology

Projection technology refers to the projection of images onto the surface of a projection carrier through projection equipment, and then combines 2D images with 3D mapping through multi-channel projection fusion technology.3D printers work on the basis of software and hardware that work together to create a 3D printing company. 3D models are the technology of the process, which can use other 3D models and .stl file formats to create software. 3D printers print from models based on layers, and can only print one layer at a time(Figure4). Therefore, it is necessary to layer the model to generate the path file, and Cura is one of the more widely used layering software. The print control software is a computer-based application that allows the G-code file control board to send commands to achieve effective control of the printer's work. Firmware is also the underlying control program, which directly affects the quality of printed items(Figure 5).
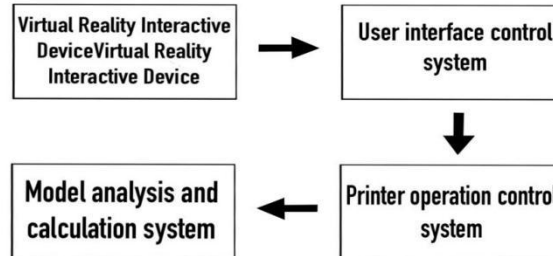


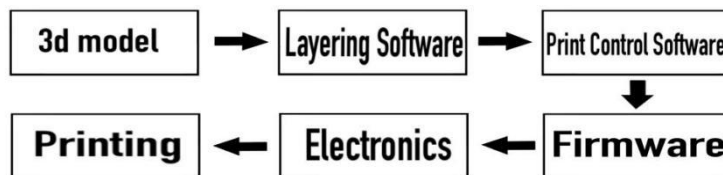**Fig.4.**Overall design structure of the 3D printing system



**Fig. 5.**How 3D printers work

That allowing for a magical interaction between the projected artwork and the scene while integrating the interpretation into a deeper virtual world. For example, in the design of public spaces monuments, buildings, walls, bodies of water and floors are transformed into virtual spaces. [10]The French painter Javier Riera, for example, uses natural scenery as a drapery to

project light and shadow effects.The combination of elements of nature and technology creates a marvelous feeling, a feeling that gives people a new understanding of nature and thus a new subjective experience. These projection works immerse the viewer in the realm of reality, and are therefore praised by the general public during cultural exchange activities in urban public spaces(Figure 6).



**Fig.6.**Digital projection technology in space

## 5.4 3D printing technology

3D printing is a computer-based sculpting technology developed through the combination of modern technology and science. Its strength lies in its ability to achieve very accurate shapes and rapid shaping, and it has now penetrated many industries, giving a new lease of life to the development of public space art(Figure 7). Its unique value is its powerful virtual data modelling capability, which allows the artist's ideas to be completely unconstrained by traditional processes, and which greatly enriches the possibilities and creativity of modern artworks. For example, the public toilet in Yangshan National Forest Park in Jiangsu Province, China, which was built using 3D printing technology, looks like an art gallery from a distance. [11]The 3D printer toilet has now become an important part of the national forest park and is a popular destination for many visitors.



**Fig.7.**Computer-influenced modeling of complex building forms and spaces

# 6    Conclusion

Public space art in a digital media society is not only about the "beauty of art", but also about the comprehensive spatial atmosphere, art, humanity and urban spirit, and about making the most of the information media to reflect the content of the artwork. At the same time, public space art is an art proposition about a social environment. It's not an individual, personal symbolic space. Therefore, it needs to be widely recognised and acknowledged by all members.

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