Research on Landscape Design Based on Digital Technology

Yan Jun*, Shan Xiao Xian
Jingdezhen Ceramic Institute, 333000, Jingdezhen, Jiangxi, China
*003240@jci.edu.cn

Abstract: Firstly, this paper briefly analyzes the concept and development of digital technology. Then it deeply analyzes the application research of digital technology, including digital projection, VR technology and mixed reality. Finally, it expounds the application research of digital technology in landscape design, and puts forward the design strategy of improving the projection technology and VR virtual reality technology in digital technology from the current situation of landscape design development in China, so as to promote the integration of digital technology in landscape design development.

1. Introduction:
With the continuous progress of science and technology, network technologies such as big data, VR technology and computer application have developed rapidly in today's society, which has promoted the great progress of digital technology. The emergence of digital technology has a great influence on the development of landscape design, so the field of landscape design should conform to the trend of the times, apply digital technology to landscape design, and promote its transformation and development by means of relevant technical means. Combining artificial landscape with natural landscape and presenting it to the public is the most important aspect in landscape design. Therefore, digital design methods such as virtual reality should be fully considered when applying digital technology in landscape design. Combining virtual reality technology can make landscape design more intuitive to the public.

2. Concept and Development of Digital Technology
The core idea of digital technology application is to convert all kinds of information data into binary numbers, and finally show them through the processes of transmission, processing and output. It covers a wide range of technical aspects, such as virtual reality technology, augmented reality technology, etc. Using digital technology to transmit information data can not only ensure the integrity and universality of data, but also enable the information data to be stored for a long time. Therefore, the digital concept develops rapidly in today's society, and even promotes the change of people's lifestyle. Augmented reality and virtual reality in digital technology are two widely used technologies at present, and these two related digital technologies are recognized and accepted by the public earlier. In addition, the rapid development of network technologies such as computer application technology, big data and Internet of Things in recent years has promoted the development of digital technology to a certain extent. On the other hand, it is the development characteristic of the digital age that the interaction between people takes the media as the carrier. With the rapid development of network technology, more and more computer technology has been applied in people's lives, and digital technology has also been developed under the impetus of this. For example, transportation, film and television, and life digital products all exist in a digital way. At present, the application and
The development of digital technology is everywhere in people's lives. For example, people used to read books in paper, but now people read books on mobile phones or buy special reading machines. In the early years, photos were mainly in film style, and now photos are mainly digital photos taken by digital cameras. Similarly, the rapid development of digital technology has brought opportunities and challenges to modern landscape design. Using digital technology in landscape design can present a more realistic landscape environment and design effect. The following figure is the application framework of digital technology in landscape design, from which we can clearly see how the landscape is completely presented through digital technology. Although digital technology has become the development trend of the times, with the different needs of people, digital technology should still have innovative spirit in the development process, so that digital technology can constantly bring forth new ideas in the current social development.

Figure 1. Application Framework of Digital Technology in Landscape Design

3. Application Research on the Digital Technology

3.1. Digital projection
Digital projection is one of the widely used technologies in digital technology, which can present the virtual landscape in the form of projection in large-scale venues. Notre-Dame de Paris was baptized by a great fire a year ago, which had great damage and influence on the historical landscape and cultural landscape of Notre Dame de Paris. Through digital projection technology, the landscape of Notre-Dame de Paris before being destroyed by the fire can be presented truthfully, and the restored landscape can provide more historical and cultural information for people. However, there are still some problems in digital projection technology, for example, because the landscape restoration area is too large, the technical facilities and projection equipment cannot operate permanently. Projection technology plays an important role in digital technology. In order to promote the long-term development of digital technology, digital projection technology must be further updated and reformed.

3.2. Virtual Reality Technology
Immersion, interactivity and conceivability are the main characteristics of virtual reality technology. It uses network technology to simulate and generate phenomena that people can't see or feel in reality, and plays an important role in digital technology. The exhibition of the famous scenic spot "Xiyang Building" is the application of virtual reality technology in digital technology. Through the network means such as virtual equipment and handle contactor provided by the staff, the experiencer can experience the feeling of walking in Xiyang Building. In the virtual scene, the experiencer can use the
rotation of the head and the control of the handle to complete the visual switching. This operation can make the experiencer feel on the spot and realize the immersive experience in digital technology.

4. Application of Digital Technology in Landscape Design

4.1. Experience Expression of Landscape

Natural elements and artificial elements in landscape are the core contents of landscape design, which is not only an artistic aesthetic but also an engineering technology. The progress of the times has driven the development of cities, and people's lifestyles have changed because of the emergence of network technology, and people have different needs for living environment. Covered by digital technology, landscape design needs to be integrated into the times to develop for a long time and meet the needs of the public. The application of digital technology such as computer image technology in landscape design promotes the application of landscape design and realizes the interaction between users and landscape design content. The integration of information by real-life landscape can realize the fast, accurate and multi-directional expression and display of information in landscape site design. Augmented reality technology has various ways of information transmission, and experiencers can receive humanistic information and site information transmitted by augmented reality technology, which greatly enhances the interaction between experiencers and landscape. For example, Longmen Grottoes is a representative historical and cultural relic in China. As a typical cultural landscape, the application of digital technology makes people and site information in Longmen Grottoes within reach. The exhibition of landscape environment in Longmen Grottoes uses digital technology, and realizes the experiential expression of landscape. The exhibition site is a relatively closed environment, and the digital information provided outside the exhibition site can be received by electronic devices such as graphics and VR, and then analyzed, processed and screened by computer application technology, big data and other network technologies, and finally the landscape corresponding to Longmen Grottoes is displayed through augmented reality technology; Most historical and cultural landscapes in Longmen Grottoes are precious and not open to the audience. Through the application of augmented reality technology mentioned above, not only the precious landscape context can be displayed to the public at close range, but also the interaction between experiencers and landscapes can be realized, and the experiential expression of landscapes can also be realized.

Figure 2. Using digital technology to collect digital information of Longmen Grottoes
4.2. Application in Landscape Relics Development

VR technology, also known as virtual reality technology, is one of the contents of digital technology, which greatly promotes the development of landscape design. The relics have rich historical information, and it is a traditional display technique to use oral and exhibition boards. This traditional display technique has uncertainties and certain errors in the process of digital information collection, processing and transmission, and can not bring interactive effects to the experiencers. However, using modern digital technologies such as computer, big data and VR to display the landscape design of relics can not only ensure the integrity and confidentiality of digital information in the transmission process, but also increase the interactive links of experiencers. Using different display methods and digital technologies can produce good interactive effects between experiencers and landscapes. It can be seen that digital technology plays an important role in landscape design, especially VR technology has great influence on the development and display of landscape relics. At present, VR technology in digital technology is widely used in landscape reconstruction and urban reconstruction. For example, Old Summer Palace is a precious royal garden in China. However, due to the influence of war and other historical factors, the architectural landscape and garden landscape of Old Summer Palace have been greatly damaged. The architectural landscape of Old Summer Palace embodies rich historical information and humanistic information, so it is very necessary to rebuild the architectural environment and garden landscape of Old Summer Palace. At present, relevant design and research teams in China have started to reconstruct the landscape of Old Summer Palace, and integrated the digital information of Old Summer Palace by using computer images, big data and other technologies, and then transformed the digital information into pictures or videos through virtual reality technology, which can make the public have a more intuitive understanding of the architectural environment and landscape of Old Summer Palace, promote the interaction between participants and the landscape environment, and realize the reconstruction of the relics and landscapes.
4.3. Application of Digital Technology in Urban Landscape Design

With the rapid development of the times, more and more urban buildings and urban landscapes have gradually disappeared into people's lives. Natural and historical factors are the main reasons for the disappearance of urban landscapes. Using digital technology to rebuild urban landscapes can make the public feel the historical emotion and humanistic spirit expressed by urban buildings and landscapes again. The construction of digital city is mainly based on computer technology, supplemented by virtual reality technology, which combines participants with spatial systems and completes the construction through spatial information. The city reconstructed by digital technology not only contains humanistic information, natural information and economic resources, but also can fully reflect the relationship between people and cities and between people and landscapes; In addition, the use of VR technology in digital technology in urban reconstruction can show the urban landscape completely and truthfully to the public, improve the public experience, promote the interaction between the public and the urban landscape, and improve the development of urban resources; Finally, the application of digital technology in urban landscape promotes the transmission of various resource information in the city, which is of great value to the future development of urban landscape design.

5. Concluding remarks:

As the crystallization of the development of computer technology, big data, Internet of Things and other network technologies, digital technology is widely used in people's lives, especially in landscape design, such as urban landscape reconstruction, relics reconstruction and restoration of cultural relics.
VR technology and digital projection technology are the core of digital technology and play an important role in landscape design and presentation. Therefore, it is necessary to constantly improve and innovate digital technology to promote its new development in landscape design.

Acknowledgement

Project Fund: Science and Technology Research Project of Jiangxi Provincial Department of Education in 2018 “Research on the Application of Virtual Reality Technology in Environmental Design” (Project Number: GJJ180732)

References:

[1] Li Zhe, Cheng Yuning. Teaching Reform and Practice of Landscape Planning and Design under Digital Technology Environment[J]. Landscape Architecture, 2019, 26(S2): 67-71.

[2] Zhang Yudong. Research on the Intervention and Practical Value of Digital Technology in Landscape Design[J]. Journal of Wuzhou University, 2019, 29(03): 52-55.

[3] Yuan Yiyao. Research on Visual Interactive Landscape Design Method Based on Digital Technology[D]. Nanjing University of the Arts, 2018.

[4] Chen Sihan. Innovation of Digital Technology to Traditional Landscape Design[J]. Management & Technology of SME (late journal), 2018(01): 154-155.

[5] Li Zhiwei. Research on Virtual Landscape Design Based on Digital Technology[D]. Nanjing University of the Arts, 2017.

[6] Zhu Biyun. Research on the Application of Digital Media Art in Contemporary Landscape Design[D]. Nanjing University of the Arts, 2016.