

Research on Digital Protection Strategy of Ancient Village Buildings in Shanxi Province based on Realistic Experience

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As a large province with the most cultural relics on the ground in China, Shanxi has a large proportion of ancient villages in the country. In recent years, the state has begun to attach importance to traditional villages, and the number of ancient villages in Shanxi has been on the rise every year. Due to the difficulty of protecting ancient village buildings and the imperfect and imperfect traditional protection methods, the use of digital protection data retention, display and dissemination can play an important role in the protection of ancient villages. Common digital protection can not provide certain experience for ancient villages, but in the process of digital protection, the sense of experience is not strong, and a technology with perfect visual and tactile interaction is urgently needed to realize the realistic cultural experience and realize the real sense of digital protection of ancient villages.

Keywords: ancient village, digital, virtual, reality

Introduction

Ancient villages are also known as traditional villages and historical and cultural villages. As a large province with the most cultural relics on the ground in China, Shanxi has a large proportion of ancient villages in the country. In recent years, the country has begun to attach importance to traditional villages. According to the number of ancient villages in Shanxi published over the years, up to 2016, a total of 279 villages in Shanxi Province were listed in the list of Chinese Traditional villages, among which 48 villages were listed in the first batch in 2012, 22 villages were successfully listed in the second year in 2013, and 59 villages were listed in 2014. In 2016, the fourth batch of Chinese traditional villages in Shanxi successfully selected 150, which shows an upward trend every year. Shanxi Province has unique topographic characteristics and a long historical and cultural background, so that these traditional ancient villages are preserved and provide us with valuable research materials. Experts and scholars have increasingly begun to pay attention to the protection and utilization of such huge traditional villages, and further explore the cultural and artistic value of traditional villages.

As the protection of ancient village buildings is difficult and traditional protection methods are not perfect, the use of digital protection data retention and display and dissemination functions can play an important role in the protection of ancient villages.

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Common Digital Protection Measures

Data Preservation

At present, common digital protection technologies mainly retain data through the use of special instruments through graphic image acquisition and spatial data acquisition, etc. Through data retention, obtaining the most comprehensive, systematic and real data is the most basic and also a very critical step in the process of digital protection. Through data retention, not only can big data be accurately mastered, but also big data can be obtained. Through the collection of big data, it can solve the shortcomings of difficult paper collection and difficult preservation in the protection of ancient villages. At present, relatively mature technologies mainly include graphic image acquisition and spatial data acquisition.

Through the use of high-definition digital cameras to the existing various types of buildings in ancient villages and related intangible cultural heritage pictures and video records, the appearance and details of the buildings are taken in high-definition photos: the traditional homestand activities such as festival activities, folk performances, cultural life, folk crafts, artists oral activities and other activities are recorded in high-definition video records. This kind of technology has a long development time and is relatively mature, and is the most commonly used means of ancient village survey and digital data record preservation.

By means of remote sensing technology and three-dimensional laser scanning technology, a large range of ancient village information such as the spatial structure of the ancient village and the regional characteristics of the entire village can be collated and collected, and real-time dynamic and constantly changing data can be obtained by using this means. Remote sensing technology has the advantages of flexibility in data acquisition, high efficiency in data acquisition and avoiding re-damage to the surveyed buildings. In recent years, due to the hot rise of UAV, low altitude remote sensing technology is more and more convenient. The UAV has the advantages of low cost, convenient use, long-term operation, and can be equipped with a high-definition digital camera during use, which can fully scan the real-time data of relevant buildings through low-altitude manual operation, so as to achieve the collection and storage of spatial data information.

When acquiring the measured data target, the three-dimensional laser will not be constrained by the measured object in space and time, and can clean the sub-millimeter level in scanning accuracy, and can collect the data of irregular building shapes or complex building components completely and accurately to obtain accurate data information. 3D laser scanning is very popular in the digital extraction and preservation process technology in recent years, and it has a pivotal position in the digital protection process with the advantages of contactless operation, high scanning accuracy and fast implementation.

Digital Display

It is an effective way to increase the publicity and dissemination of the humanistic environment, historical landscape and related cultural connotations of ancient villages, and attract more people to pay attention to and protect them. As the amount of information in ancient villages is very large, it is impossible to meet the needs of many tourists simply by visiting them. The use of today's hot virtual reality technology and "Internet +" has become an important means of digital protection at present.

Virtual reality technology: also known as VR technology, mainly with the help of computers and other equipment to produce a realistic three-dimensional vision, touch, smell and other sensory experience of the

virtual world. Through virtual reality technology, the real image of ancient villages can be intuitively displayed, and the real experience brought by technology can be felt in an all-round, no-dead corner, close distance and more three-dimensional immersion. Entering the scene can enhance the visitors' sense of high participation and interaction.

"Internet +": "Internet +" is through the analysis of data, through the extraction, calculation and analysis of big data, to achieve "digital tourism" and "smart tourism". Through the establishment of ancient village digital service platform, ancient village digital museum. The realization of tourism digitization, through the simulation of buildings, etc. to rebuild the ancient village at that time brilliant style and historical heritage. Promote ancient villages through the development of digital peripheries and cultural and creative products.

Study on Digital Protection Strategy of Ancient Village Buildings in Shanxi Province

With the development of modern digital technology, the protection of ancient villages is no longer just reconstruction and restoration. The use of digital technology to collect relevant data and realize new digital protection through data sorting and utilization can make the life cycle of ancient architectural culture longer and the preservation time can be extended. The purpose of its protection is to use digital technology to protect the traditional culture of ancient villages, so as to achieve the purpose of inheriting the traditional culture of ancient villages. Through digital protection, the repair process can be faster, and the repair results will be more accurate. Digital protection can not only greatly improve the feasibility of protecting ancient villages, but also improve the cognition level of ancient architectural culture through digital display.

At present, the digital protection of ancient villages in China has made great progress compared with the traditional protection. Virtual reality technology can be used to collect all kinds of data in the early stage, use computer technology to generate electronic signals, and convert them into various forms of images that tourists can watch. VR and AR technology is no longer a static display method, but a vivid and comprehensive display of the overall image and details of ancient villages. The processing needs to use 3D virtual professional software with professional standard configuration, and the display platform needs to have corresponding interaction technology, touch screen interaction, VR or AR device support, etc., so that the experient can be placed in a virtual panoramic space at close range, thus effectively realizing the purpose of display, publicity and inheritance. Experiencers are free to choose what they are interested in. The combination of virtual reality technology and different spatio-temporal data can also be applied to the protection planning of ancient villages, the construction of virtual museums, and the development of digital tourism products. The virtual interaction function design

The establishment of digital museum of ancient villages is the most realistic digital experience museum in the process of digital protection of ancient villages. Collect the images and picture materials of the ancient village's geographical environment, human landscape, village architecture, famous and popular culture, and restore and build it through simulation, add audio and video explanations, and use animation and other forms of display to make the experiencer feel as if they were in the life scene of the ancient village at that time, and present the past, current situation and cultural and historical knowledge of the ancient village through this way. It can improve the experience effect of visitors.

There are Some Problems in the Digital Protection of Ancient Villages based on Realistic Experience

Realistic experience is to make a comprehensive effect analysis on the external and internal factors that affect users' multi-sensory cognition, formulate prediction models and evaluation standards, build an immersive user experience prediction and evaluation model by combining visual and tactile cognitive effects, content elements and the visual and tactile elements that appear when they are combined, and develop a highly immersive multi-sensory experience creation platform. Apply the effects through immersive cultural content.

Vision and touch refers to the simultaneous provision of vision and touch, including not only the respective cognitive role of the two senses, but also the interaction of the two senses influencing each other. In the meta-universe environment, including immersive media, physical interaction is emerging as the next enabling technology, promising to be a new technological breakthrough for the stagnant immersive media industry. Unlike vision-hearing, in the field of touch, there are no models built to predict cognitive effects based on stimuli, making it difficult to create tactile systems and author tactile content.

The demand for multi-sensory user experience prediction and evaluation models that consider all sensory cognitive effect elements, content elements and interactive elements is expected to increase in the aspect of digital protection of sensory experience in ancient villages, but there is no systematic methodology yet.

Immersive physical interaction is one of the important technical elements for the further leap of immersive media industry. However, compared with user expectations, there is still a large gap in the current technological perfection. Therefore, haptic perception prediction and user experience, as one of the main elements to narrow the gap, are the basic elements for effectively developing multi-sensory immersive media systems and content. The lack of tactile content can be addressed by providing authoring tools that develop cognitively optimized visual and tactile content for each content need through cognitive experience prediction techniques.

Due to the difficulty of high-fidelity analog haptic feedback, most of the current consumer VR devices can not provide a true and complete tactile perception experience, touch simulation, physical sliding, texture perception and other solutions are not relatively mature standards. Because the touch experience involves a very wide range of application levels, in some scenes, the role of touch is as important as sight and hearing. Nowadays, most virtual simulation resources only pay attention to the simulation aspect and ignore the behavior and feeling of the experiencer as the subject. Therefore, in view of the lack of visual and tactile interaction technology in the design and generation of virtual simulation resources, a kind of visual and tactile interaction technology is designed to achieve realistic cultural content experience.

Conclusion

With the continuous progress and development of digital technology in China, the combination of digitalization and ancient village protection will have greater possibilities in the process of ancient village protection, and will play a pivotal role in the protection of ancient villages and the inheritance of cultural heritage historical value. Studying the digital protection of ancient villages is conducive to exploring and enriching the spatial protection planning, and it is easier to understand the theories and methods of the inheritance of construction skills. It is conducive to the collation and preservation of ancient village data, constantly improve the systematic and parametric digital content of ancient village information, and provide

more possibilities for the revival of ancient villages. On this basis, it will be beneficial to promote the protection and application of cultural heritage of ancient villages in Shanxi Province. In contemporary society, with the continuous development of digital technology, how digital technology can really save the ancient villages on the verge of disappearing needs the whole society to continue to explore and innovate.

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