

## **A Preliminary Study on the Design of Folk Culture Digital Expo in Zhuqiao Ancient Village, Jinxi County**

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**Abstract:** From the point of view of digital technology, this paper analyzes the necessity of the design of the ancient architecture group of Ming and Qing dynasties and the digital museum of folk custom and culture of "three sculptures" in Jinxi County, Fuzhou, Jiangxi Province. In this paper, the frame structure of digital museum is briefly listed, the Photoshop, Premiere, After Effects, 3Dmax, Unity 3D software used in digital museum design is analyzed, and the picture and video database of ancient buildings of Ming and Qing dynasties in Zhuqiao Ancient Village is described in detail. The flow of the VR roaming platform of Yu's Grand Temple and the 360-degree panoramic interaction of Zhuqiao Ancient Village buildings in Ming and Qing dynasties. The technical method provides a comprehensive application of digital technology for the construction of digital museum, and provides a reference method for the protection, transmission and experience of folk culture.

### **1. Introduction**

Jinxi County, located in Fuzhou area of Jiangxi Province, is an ancient historical and cultural county with jurisdiction over 7 towns (Xiugu Town, Hu Wan Town, Shuangtang Town, he Yuan Town, Hezhen Town, Langju Town, Zuofang Town), 6 townships (Huangtong Township, Qiaoxiang Township, Lufang Township, Chen Fangji Township), Liuli Township, Shimen Township). During the period, there were a large number of ancient buildings in the Ming and Qing dynasties. According to the recorded written records, there were 80 ancient villages, 920 ancient buildings, and almost every ancient building had a large number of "three sculptures" artistic traces. During a video interview in Jinxi County, the author found that almost all of these "three sculptures" were damaged in varying degrees. "three sculptures" is the Treasure of Jiangxi Culture and Art The craftsmanship and folk culture contained therein are important intangible cultural heritages. With the development of "Digital Heritage China Journey", the ancient villages headed by Zhuqiao Ancient Village in Jinxi County are being repaired and restored. At the end of 2017, the ancient village of Zhuqiao was named a national 4A tourist scenic spot to protect and inherit the folk culture of the ancient village of Zhuqiao in Jinxi County in response to the call of "Digital Heritage China Tour". The design of digital museum of folk culture is imperative. Digital museum design is divided into four major modules: picture and video database (pictures are conducive to viewing the whole in intuitive browsing mode Layout and details of the three sculptures, the video itself has intuitive, recording and dissemination function, intangible cultural heritage transmission of the effective means); Yu's Hall VR roaming platform (with bamboo bridge ancient village representative architectural examples Yu's hall to show the Ming and Qing dynasties architectural interior and "three sculptures" technical details and surrounding geomantic environment); The 360-degree panoramic interaction of the ancient village buildings in the Ming and Qing dynasties (one-to-one restoration of the ancient village buildings in the ancient village of Zhuqiao, the layout of the whole building can be roaming from many angles). This design starts with the construction of the Ming and Qing dynasties ancient buildings and the "three sculptures" image database in Jinxi County, and makes use of the modern digital media technology to advance. To carry out the construction of "Digital Museum of Folk Culture" in order to provide technical reference for the construction of heritage "non-legacy" in Jiangxi Province and

provide digital materials for the construction of Jiangxi Folk Culture Museum. To provide data reference for local folk culture, art and heritage, in order to provide digital technical support for the protection and inheritance of Jiangxi folk culture.

## **2. The necessity of constructing the Digital Museum of Folk Culture in Zhuqiao Ancient Village, Jinxi County**

Feng Jicai, chairman of the Folk Literary and Art Association, pointed out that traditional villages are the spiritual homeland of the Chinese nation. The traditional village in Jinxi County is the spiritual habitat of people in Jinxi County. The traditional techniques contained in the works of "three sculptures" in the architecture, folk art and folk culture are the evidence of the inheritance of Jiangxi culture. In recent years, with the demise of the traditional villages and the destruction of the material cultural heritage, the inheritors of the intangible culture have grown older and older, and the protection of the ancient village buildings in Jinxi County and the severe test faced by the inheritance of the "three carving" techniques. The design of digital museum of folk culture is an important means. The audience can experience the construction of bamboo bridge ancient village in Jinxi County through the digital form. The overall appearance of the group and the details of the patterns and engraving techniques of the "three sculptures"; through interviews with the folk art inheritors of the documentary film and television can be seen to understand the spread and changes of local folk culture, and so on. Digital means can better preserve the whole picture of ancient architecture, "three sculptures" works, folk skills, folk culture and other data of the ancient village of Zhuqiao ancient village in Jinxi County. It is a supplement to the physical display and an innovative form of cultural relics display. The production of digital museum of folk culture needs to be realized by means of aerial photography, digital image processing, video editing, three-dimensional graphics and virtual reality. Digital technology for gold Xixian Zhuqiao ancient village architecture and "three sculptures" works for reproduction, simulation, display, preservation, dissemination, users through the digital museum viewing and experience, can truly experience the sense of space, and even in the process of interaction, There is a real sense of immersion. In addition to providing traditional museum collections, research, display and education functions, digital museums can transmit their accumulated knowledge and cultural assets through the Internet to all parts of the world. It strengthens the function of knowledge sharing and educational dissemination in traditional museums.

## **3. The structure design and module composition of the digital museum of folk culture in Zhuqiao ancient village, Jinxi county**

The digital museum of the folk culture of the ancient village of the bamboo bridge in Jinxi County, which is designed for the general public, is divided into four modules, namely, the image video database of the Ming and Qing complex of the ancient village of the bamboo bridge, the database of the film and television documentary of the ancient village of the bamboo bridge, the VR roaming platform of the Yu's and the 360-degree panoramic interaction system of the Ming and Qing complex of the ancient village of the bamboo bridge. in which, the picture video database of the Ming and Qing complex of the ancient village of the bamboo bridge is used as the basic part of the project, and a hand information data is collected in the ancient village of the bamboo bridge in the Jinxi county, and the terrain and features of the ancient villages are taken by the unmanned aerial vehicle, and the details of the "three-carvings" works are taken in the ancient building; The database of the film and television documentary film of the ancient village of the bamboo bridge has passed an interview with the local important folk art. People who are familiar with folk customs and people who are familiar with folk customs. Yu's Hall VR roaming platform display through virtual reality technology, based on the Unity platform, using the integrated modeling method to build the model, with the help of Photoshop to deal with the real picture, finally VR synthesis; Through the investigation of the shooting site of the ancient village of Zhuqiao, listing the shooting script, sorting out the main and secondary, selecting the scene site, splicing and uploading to the platform after shooting.

### **3.1 Structure Design of the Digital Museum of Folk Culture in Zhuqiao Ancient Village, Jinxi County**

The design of the ancient architectural complex and the "three-carvings" system of the ancient village of the Bamboo Bridge in Jinxi County, is an important work of the design of the digital museum of the folk culture. The digital museum is divided into a picture video database, a bamboo bridge and an ancient village film and television documentary database according to the function and contents. It is beneficial to ensure the normal operation of the digital museum, the data of the platform is to be continuously updated and maintained, the integrity of the information, the interactivity and the operability of the system are fundamental.

### **3.2 Modular composition of the Digital Museum of Folk Culture in Zhuqiao Ancient Village, Jinxi County**

#### **3.2.1 Ancient Building Group of Ming and Qing dynasties and "three sculptures" Image and Video Database Module in Zhuqiao Ancient Village, Jinxi County**

Zhuqiao Village, located ten kilometers north of Jinxi County, is a model of traditional buildings in the Ming and Qing dynasties in China. The village has green brick and gray tiles, high wall and deep alleyway, and it is interesting to see the surrounding green mountains and green waters. At present, there are more than 100 ancient buildings built in Ming and Qing dynasties, of which eight houses were built in the Ming Dynasty, one ancestral hall in the Ming Dynasty (Wen long Gong Temple, that is, Yu's ancestral Hall), and the rest were Qing Dynasty buildings, which began in the late Yuan and early Ming dynasties. In addition to one of the Ming Dynasty residential buildings divided into up and down four, most of the dwellings for up and down two. House lintels, eaves, eaves and interior walls, doorposts, window lattices, columns, squares, panels, ceilings, stone foundations, etc., are decorated with carved patterns. A classic work of art. Using drones to photograph the layout of the whole building complex, the construction layout can be clearly recorded, the "three sculptures" technology within the complex can be recorded, and the pattern will be photographed with the combination of camera and SLR camera, in which the pattern of "three sculptures" will be taken for a long time. Because of the local wear, the digital acquisition and repair are carried out by the mixing mode of SLR camera and 3D scanner and the post-processing. Each of the houses photographed is equipped with a detailed text description and expert analysis to trace the historical origin of the internal engraving patterns, through shooting, collating, collecting relevant information to form the Zhuqiao Ancient Village Ming and Qing dynasties ancient buildings and "three sculptures" picture and video data. Library.

#### **3.2.2 Yu's Grand Temple VR roaming platform display Modul**

After the exhibition and production of the VR roaming platform of Yu's Hall, after collecting information on the Internet, the scene architecture, the material of the scene, the terrain structure, the trees and the structure of the building were investigated on the spot, and the modeling of the scene of Yu's Hall and the surrounding scene was carried out by using the 3DMAX software tools. After the model is finished, import Unity 3D to add maps, lights, trees, add lights to the scene, create the sky box, and animate the camera rendering. Then the VR plug-in of Google is imported into Unity3D to realize the VR scene and generate the VR roaming platform of the digital Yu's shrine

#### **3.2.3 360-degree panoramic interaction Module of Zhuqiao Ancient Village, Jinxi County, Ming and Qing dynasties**

The 360-degree panoramic interaction of Zhuqiao Ancient Village buildings in Ming and Qing dynasties is to virtualize the physical scene, introduce the panorama into the production software to be 3D, and then introduce the experimenter into the virtual scene through the VR experience equipment, which can basically meet the needs of the experimenter's visit. The 360-degree panoramic interactive platform is designed first to define the theme, to survey the shooting site, secondly to investigate the shooting environment, list the shooting script, and distinguish the primary and secondary. Select the

landscape site and theme, etc. After shooting for splicing, pay attention to the switch between the scenes, the unity of the content of the screen style. Whole platform It is made up of eight scenes, which are transformed from the external environment of aerial photography to the indoor scene, and the whole environment of aerial photography is focused on a certain detail element of the ancient residential buildings, and shooting is carried out. By switching different scenes, the whole work is unified and harmonious. Switch to different scenes with a narrator to illustrate. After uploading a single scene to the 720 Cloud Panorama Network, you can set up the relevant content through the background of the website, including project name presentation, text introduction, and the conversion of each scene to each other, and you can add a separate picture to each scene. It can also add complete phonetic explanation and background music to the whole, and build the ancient village of Zhuqiao in Jinxi County in Ming and Qing dynasties. Build a 360-degree panoramic interactive platform.

#### **4. Realization of Digital Museum of Folk Culture in Zhuqiao Ancient Village, Jinxi County**

The Digital Museum of Folk Culture in Zhuqiao Ancient Village, Jinxi County, based on the picture and video database module, takes the VR roaming platform display module of Yu's Grand Temple as an example, and takes the 360-degree panoramic interaction between the Ming and Qing architectural groups in Zhuqiao Ancient Village as the final introduction platform. Each module can be switched between each other in the platform to create a better experience for the user.

##### **4.1 Development of VR roaming platform for Yu's Temple**

###### **4.1.1 Research on 3Dmax Modeling Technology**

Before the model was built, the real scene of Chuqiao Ancient Village was collected. Finally, several pictures were confirmed as a reference, sketched, and photographed with SLR on Yu's Hall and the surrounding real-scene buildings, because it was the restoration of the real scene. So take panoramic pictures of multiple single houses and map many details of the house, take the house vision, mid-range, close-up, close-up and close-up. Take a single shot of the details, antiquities and sculptures of the house. The real scene modeling is carried out by 3DMAX software. Modeling is a very important part. By analyzing the structure, shape and characteristics of the building model, the model is modeled according to the measured data, and the accuracy of the model is checked according to the perspective view. When creating a model In order to save the number of faces, we should choose the appropriate modeling method, build out the gross model structure, and then detail it. For scene mapping, Photoshop is the most popular software for image processing. It has a simple and rapid method of making pictures. In the establishment of the ground model, the irregular road surface adopts the modeling method of capturing several suiTable pictures by using aerial video, using the way of creating the patch, adding the line, squeezing the surface, reducing the line segment and making the modification to the surrounding area again. Finally, the desired requirements are met.

###### **4.1.2 Application of Unity3D Software**

Unity3D is a quick and convenient creation such as 3D games, simple games, building visualization, VR games, VR scene browsing and other types of interactive content, 3DMAX inside the use of archiving, map and material export, extract archive files, Open Unity3D software, first the map is imported into Unity3D, in the import model, so that the model will automatically adapt the map, do not manually match, import grass and tree plug-in Unity3d, such trees and grass will be more realistic. The Unity3D built-in parallel light is used as the main light source of the scene. Through Set different lights to render the scene to a realistic lighting effect.

The sky box is far away from the scene, without many details and simple. Create dynamic browsing under the Create panel, create Camera to set it to Main Camera, in the parameters panel, create a Animation, in the camera premise, create a Animation, in the camera into Animation, create Position in Animation and Rotation, in the key pin to create motion tracks. Adjust the motion time, direction to make the motion trajectory more perfect.

#### **4.1.3 Implementation of VR system**

Using unity software and Google plug-in technology (Virtual Reality), to import Google VR plug-in into Unity3D. In the Prefab option of the imported plug-in, we can find GvrMain, and put it into the created Main Camera to realize the VR scene.

#### **4.2 360-degree panoramic interaction of Zhuqiao Ancient Village complex in Jinxi County**

In the 360-degree panoramic display design of the Zhuqiao Ancient Village complex, the overall layout of the UAV aerial photo building complex was used as the introduction screen, the panoramic camera was used to photograph each angle of the interior space of the residence and 360-circle photography was carried out for a week. In order to ensure the perfection of the final synthetic effect and the real experience of immersion, it is necessary to close to the face to ensure the true experience of the internal pattern. In the process, we should stay away from the dynamic object and the close-range deformation. After the image export in the composition, as far as possible not to leave a flaw, to achieve the digital virtual exhibition hall of the real experience. The use of this technology has lower requirements for allocation and can guide students involved in the project to make. Number The exhibition hall provides two modes of manual walkthrough and automatic walkthrough. Manual walkthrough experiencers can zoom in and out of the image through the manipulation function provided by the platform, and move the mouse to carry on the roaming switch of the scene. At the same time, you can use mobile phone and VR glasses for immersive experience, its restoration effect is real and vivid.

#### **4.3 Testing and publishing**

After the testing of the three modules, the independent .exe program was made, and the work was published. Finally, the digital museum of folk culture in Zhuqiao Ancient Village, Jinxi County was completed.

### **5. Conclusion**

The digital museum of folk culture of bamboo bridge ancient village in Jinxi county not only brings visual feeling to the viewer, but also brings satisfaction to people psychologically. While watching this work, the contents displayed by the digital museum are deeply rooted in the hearts of the people. Strengthening the self-confidence of national culture is of great significance to the dissemination and protection of Jiangxi folk culture. While people experience the convenience of digital technology, its innovation provides the technical basis for the construction of digital museum in Jiangxi Province. Is the new media era "non-legacy" inherited form innovation.

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(2)Design of clothing display Digital experience Hall of Jiangxi Garment College based on New Media Art Science and Technology Project of Jiangxi Education Department, Nov 2016 GJJ161209

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