

Art and Design under the Meta-Universe Concept

-- Taking the restoration of Zhengda Guangming Scenic Spot and Jiuzhou Scenic Spot as an Example

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Abstract. In modern times, many scholars have put forward plans for the restoration of the Old Summer Palace, but the architectural form and style of the Old Summer Palace are too luxurious, and the restoration requires great manpower and material resources, so the restoration work mainly focuses on the restoration of some mountain water systems. However, if the building is not restored, and the cultural core of the Old Summer Palace itself is lost, and the restoration of the Old Summer Palace will be impossible. In view of the more than 100 landscapes of the Old Summer Palace are all the organic combination of landscape, flowers and trees, buildings, complement each other, but it is difficult to repair the overall Old Summer Palace, expensive, so it is a good way to restore its morphology in the virtual space. This project aims to establish a model of Jiuzhou scenic spot through the establishment of virtual space and record documents and pictures, and restore the "million garden" in the metauniverse, so that people of later generations can see its infinite scenery.

Keywords: meta-universe, Yuan Ming Yuan, virtual, restoration, architecture, landscape.

1. Introduction

In recent years, the continuous development of Internet technology has made the Internet of everything possible. While a series of new products based on Internet technology, such as smart home and smart cars, are booming, a brand new concept is born: the "meta-universe". Actually traced back, this concept is not new, it is already in 1992 American science fiction the avalanche (snow crash), then appeared in a large number of film and television works, such as the matrix, appeared similar people and the virtual world link, people can experience in the virtual world similar to the subjective experience of the real world. So far, the metaverse that appeared in related films and television works is limited to science fiction concepts, until 2021, the potential huge business opportunities of the metaverse attracted the Internet giants at home and abroad, and they invested huge funds to promote the development of the metaverse project. At this point, the yuan-universe officially entered people's vision. The proposal of this concept, while realizing the prediction of existing industrial change, also promotes the rapid development of emerging industries. This kind of realistic projection virtualization scenario can not only well reflect and guide the practice of real production and life, but also reduce the exploration cost of real production, which has a broad and far-reaching significance for the development of production and life.

The Old Summer Palace was presided over by the Qing emperor. It was first built in 1707, and is generally composed of "Yuanming", "Changchun", "Qichun" three gardens, covering an area of 350 hectares (totaling more than 5,200 mu), a total construction area of more than 160,000 square meters, there are more than 100 gardens, is a veritable large palace. The Old Summer Palace is an artistic treasure of Chinese culture and also the best witness of modern Chinese history. Back to 1860, the British and French coalition invaded Beijing, make the Old Summer Palace was looted, the remaining eight banners and bandits to the ruffian also participated in the devastating movement, they will be the Old Summer Palace after basic restoration and a total of nearly one hundred architectural cultural relics, buildings, ancient trees and artifacts were different degrees of damage, and even completely destroyed. In modern times, many scholars have put forward plans for the restoration of the Old Summer Palace, but the architectural form and style of the Old Summer Palace are too luxurious, and the restoration requires great manpower and material resources, so the restoration work mainly

focuses on the restoration of some mountain water systems. However, if the building is not restored, and the cultural core of the Old Summer Palace itself is lost, and the restoration of the Old Summer Palace will be impossible. In view of the more than 100 landscapes of the Old Summer Palace are all the organic combination of landscape, flowers and trees, and buildings, which complement each other, but the overall repair of the Old Summer Palace is difficult and expensive, so it is also good to restore its appearance in the virtual space. This project aims to establish a model of Jiuzhou scenic spot through the establishment of virtual space and record documents and pictures, and restore the "million garden" in the metauniverse, so that people of later generations can see its infinite scenery.

2. Construction of virtual scenes

Advanced realistic technologies such as VR / AR / MR will bring human society into a highly intelligent and real-time interactive communication era. [1]In contrast to non-immersive communication, immersive communication provides sensory immersion and real-time engagement with its unique "person-centered, omnipresent" communication nature. It sometimes uses the ability to air conditioning, that is to say, it can overcome the obstacles of time and space, from macro to micro, from near to far to integrate the past and the future together. The expansion of real media and its creation of immersive communication can show strong horizontal contact: it not only like traditional media contact people and information, and on the basis of realize the people and things, the real world and the deep connection of the virtual world, at the same time, people's thought world is integrated, the user's service demand are triggered, the key functions of different resources to gather[2]. Cloud virtual reality can become the mainstream of the future media development. Similarly, the virtual reality industry can be regarded as the core industry of the future metacosmic development, with inestimable broad development prospects.

Our project uses the "SketchUp" software architecture and the "Lumion renderer" to render, which can let us use the first-person view of the virtual space. This project is only an attempt to introduce jade to the metaverse. First, we will restore the architectural landscape and mountain water system of the Old Summer Palace in the virtual space, so that users can truly feel the artistic attainments and cultural core of the Old Summer Palace as a masterpiece of classical gardens.

3. A Brief Introduction to the Old Summer Palace landscape

Zhengda Guangming this group of scenic spots, is the first of the Old Summer Palace and the official government of the Old Summer Palace. Great palace gate five, sit north to south, in front of the room each five. Great palace door for in and out of the virtuous gate five, actually for the two palace door. The whole great palace Gate area is the place where the emperor's garden was ordered. Enter the entrance to the virtuous gate, the eye is the Old Summer Palace —— Zhengda Guangming Hall, with seven halls. In front of the hall, a platform is built in width, and the building is equipped with five east and west halls, which is similar to the Renshou Hall in the Summer Palace. The Zhengda Guangming Hall was not only a place where the emperor held court meetings and dealt with political affairs, but also for large celebrations and meetings with ethnic minority leaders and foreign envoys, and for the imperial examinations. This is true of several generations of emperors, from Yongzheng to Xianfeng. [3].

Jiuzhou scenic area covers an area of about 28 hectares, and the "Jiuzhou Qingyan" on the south bank of the lake, covering nine parts: "Moon cloud", "Yitong Academy", "Natural Pictures", "Sky", "Ciyun", "Honest", "Apricot Flower Spring Hall" and "Ruguhan Today"."Jiuzhou Qingyan", as the earliest built, is also the largest scenic spot, and the Zhengda Guangming Hall across the lake. In fact, the nine parts are islands connected by nine bridges. Throughout this picturesque complex is the product of Emperor Yongzheng's grand political ideal of world peace and Jiuzhou unity. At the same time, it has the meaning of "Yugong Kyushu", and the famous sentence of the Book of Songs: "under the whole heaven, it is not the king's earth", which promotes the rule of the Qing Dynasty. Jiuzhou

Qingyan Hall, located in the northernmost end of the three main halls, adjacent to the Back Lake. The forehead of the temple for Emperor Yongzheng himself, the forehead book "wei wei and deep show", the ruler called it "the world of peace and good weather" treasure[4]. However, Jiuzhou Qingyan scenic area eventually can not escape the situation of destruction. In 1860, in the process of looting and destroying the Old Summer Palace, the British and French allied forces destroyed or destroyed the precious relics of the ancient Palace, and the whole civilization was destroyed.

4. Display of finished products

4.1 Review

Around the ninth year of Emperor Qianlong, under the instruction of Emperor Qianlong, various painters and ci officials of the Qing Dynasty drew 40 scenes of the Old Summer Palace, which better depicted the scenery of the Old Summer Palace at that time, giving us a reference to the original data for modeling. In British and French coalition plunder, interior house style room palm head lei family design style of "ray", due to the war by maid eunuch outflow, spread is very rare, so we use relatively large proportion of forty garden landscape, through SketchUp and Lumion renderer, modify some unreasonable place, finally the Qianlong years fair scenic area and Jiuzhou scenic area modeling and rendering, aims to the two parts of the scenic spot digital restoration and preservation, and then show the ancient Chinese people's architectural wisdom and excellent traditional culture. At the same time, the digital preservation of the traditional cultural material carrier also extends its material vitality and provides an intuitive reference for the cultural textual research of the later order.

With the development of the meta-universe concept, More and more people will see the glory of the this part of the Old Summer Palace in the digital world, Believe that in the near future, The forty scenes of the Old Summer Palace will first be restored in the virtual world in a digital form, Based on this basis, More and more things that have already disappeared, Or the soon-disappearing material medium of traditional culture, Will be reproduced in the meta-verse in the form of lower threshold digital modeling, Then, to guide the restoration of reality, It can also serve as a great window for more people to learn about Chinese culture, Experience the thousand-year cultural heritage in an intuitive and three-dimensional way, That's what we mean by doing the digital recovery. The restoration results will be shown by comparison with the 40 scenes in turn.

4.2 Zhengda Guangming Scenic Spot

Zhengda Guangming scenic spot is the first of the 40 scenes, for the main hall of the Old Summer Palace, is the emperor of the Qing Dynasty in the Old Summer Palace. It was also because of its grandeur, it was taken as a temporary command by the British and French allied forces, and burned down after their retreat. Now the entrance of the Zhengda Guangming Palace has been changed to rice fields, the temple is marked with the position, the north only shoushan and left, jade bamboo shoots also disappeared.



Fig. 1 The whole picture of Zhengda Guangming scenic spot in the 40 scenes

We searched for ancient books and documents and modeled them. The modeling results matched the original picture, such as the picture below:

4.3 Jiuzhou Scenic Spot

Jiuzhou Scenic Spot is the first scenic spot after entering the Old Summer Palace through the Zhengda Guangming Scenic Spot, which is divided into two parts: The Front Lake Scenic Spot and the Houhu Scenic Spot. The former lake is in the south and the latter lake is in the north. Jiuzhou Scenic Spot, due to its early construction, the scenic spot has become the main part of the Old Summer Palace. There are nine small islands around the back lake, including the meaning of Jiuzhou, which is the main place for the emperor to entertain guests and play, with various buildings and art collections, which is a cultural center to show the craft skills of that time.

During the Opium War, the British and French allied forces brutally looted and destroyed it miserably, and the whole scenic area was destroyed. Now, farmland, factories and housing have been built on its old site, which is not the style of the year. We have modeled and restored the nine small islands in the Jiuzhou Scenic Area in turn, hoping to reshow the former glory of this cultural treasure.

4.3.1 Jiuzhou Qingyan

"Jiuzhou Qingyan" consists of three iconic southbound main halls, located between the front lake and the back lake. As the center of the Jiuzhou Scenic area, it has the largest architectural complex in the Houhu scenic area. The three halls are responsible for the emperor's banquet, the display of various court tribute, the emperor's bedtime and reading and enjoying the scenery.

Here is a presentation of our digital recovery:



Fig. 2 The whole picture of Jiuzhou Qingyan in the 40 scenes

4.3.2 Louyue Kaiyun



Fig. 3 The whole picture of Louyue Kaiyun in the 40 scenes

"Louyue Kaiyun" was built in the southeast corner of the lake scenic area, formerly known as the peony pavilion, symbolizing peace and prosperity, lounge, library and viewing platform here, famous for flowers, Kangxi 61 years, Kangxi, Yongzheng and Qianlong once grandparents three generations

in this flower flowers, so in the Qianlong nine years of the main building peony platform to Ji'en Hall. Now the site of the past carving column jade Che has disappeared, replaced by a piece of wasteland.

Here is our recovery diagram:

4.3.3 Natural drawing

"Natural drawing" is located on the east bank of the rear Lake, with the theme of a square building, with bamboo buildings and a bookcase. The garden plants are magnolia, which was planted at the same time as the Old Summer Palace. Emperor Qianlong thought that magnolia here was the same age, so it was called the ancestor of magnolia in the Imperial Garden. In addition, during the Qianlong period, many imperial sons and daughters were born and lived here. Today, the site has only square pools excavated from the south.

Here are our modeling results:



Fig. 4 The whole picture of Natural drawing in the 40 scenes

4.3.4 Bitong Academy

"Bitong Academy" was built in the northeast corner of the Later Lake, where the Qing Dynasty emperors read, painted and enjoyed the mountains. It was quiet and deep, full of parasol trees, a symbol of integrity and purity. Only the rectangular pool and the stone bridge columns that stand on it remain.

Here is our recovery:

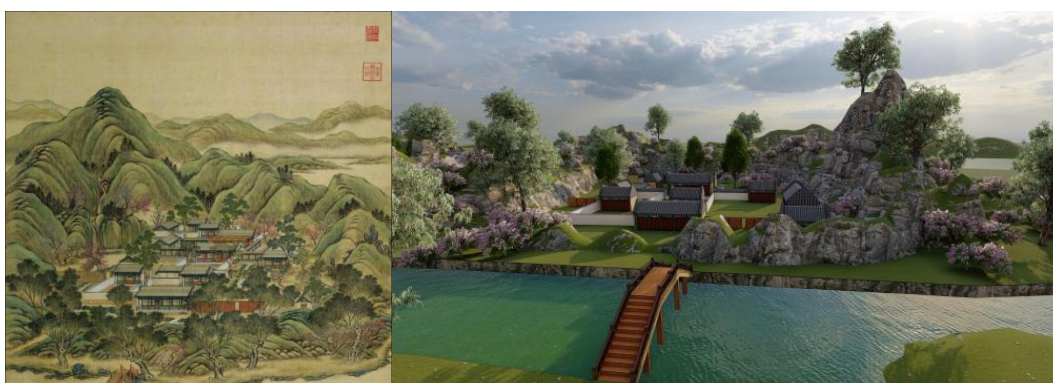


Fig. 5 The whole picture of Bitong Academy in the 40 scenes

4.3.5 Ciyun Puhu

"Ciyun Puhu" is located on the north bank of the rear Lake, with many temples and gardens. Yongzheng believed in Buddhism in the early stage, and then worshipped Taoism after he ascended to the throne. Among them, the palace was established to worship the gods and Buddhas, to pray for many sons and good weather, and there were also some singing bell towers to remind Yongzheng of his work hard. Now, the remains of the bell tower have been cleared and excavated in the north of the relic. The ringing bell building, as another clever invention of Chinese skilled craftsmen, shows the superb handicraft skills of Chinese craftsmen.

Our recovery is as follows:



Fig. 6 The whole picture of Ciyun Puhu in the 40 scenes

4.3.6 Upper and lower sky light

"Upper and lower sky light", named from the poem in "Yueyang Tower", is located in the northwest position of Houhu, and the main body is Hanyue Tower. Hanyu building as a two-story open pavilion, built near the water, left and right water pavilion, connected with nine curved bridge. During the Daoguang period, the water part was demolished, and the Han moon building was also transformed into a misty rain building. Now, after archaeological excavation, the original relics have been cleaned up and restored, and the platform in front of the culvert moon building has been rebuilt.

Here is our recovery:



Fig. 7 The whole picture of Upper and lower sky light in the 40 scenes

4.3.7 Apricot Flower Spring Pavilion

"Apricot flower Spring Pavilion", also known as apricot flower village, named after Du Mu poem sentence, to express the pastoral interest. It is located in the northwest of Jiuzhou scenic spot, for the highest scenic spot, imitation of Kunlun, during the farmland vegetable garden, planted full of fruits and vegetables, apricot flowers open in spring, the emperor usually came here to taste the wine and enjoy the flowers. During the reign of Emperor Qianlong, the scenery of the villa was built, with high artistic value. The foundation remains today.

Our recovery modeling diagram is as follows:



Fig. 8 The whole picture of Apricot Flower Spring Pavilion in the 40 scenes

4.3.8 Tantan Dangdang

"Tantan Dangdang" is located in the west of the back lake, imitating Hangzhou Qinglian Temple artistic mood, raising thousands of koi tail, commonly known as the goldfish pond. Scenic spots are surrounded by water have built Bridges, among which the stone bridge Bilan Bridge is the most famous. Through bililan Bridge, you can come to the "apricot flower spring pavilion" introduced above. This is the crystallization of the ancient fish appreciation culture, is the empress emperor and the Empress Dowager often come to visit. After the archaeological cleaning, the goldfish pond and the stacked stones are once again displayed in front of the world.

Our recovery modeling diagram is as follows:



Fig. 9 The whole picture of Tantan Dangdang in the 40 scenes

4.3.9 Rugu Hanjin

"Rugu Hanjin" is located in the southwest corner of the rear lake, in the south of the "open", is the place of the Qing Dynasty emperor reading in winter, private banquet ministers to talk about the ancient and present, also known as Shao Jingxuan. The second floor, as the best viewing site of the Jiuzhou scenic spot, is relatively flat and the building is shorter.

Now the Palm ting Bridge in the east of the site has been restored, and a considerable number of original paintings of Qing emperors and ministers are preserved in the scenic area.

Our recovery modeling is as follows:



Fig. 10 The whole picture of Rugu Hanjin in the 40 scenes

5. Summary and Outlook

Mr.Liang Sicheng said, " China's wooden structure system can remain invincible in such a vast region and for four thousand years, and it is still being applied without its basic characteristics. This phenomenon, only the continuity of the Chinese civilization can be compared with it."

The architecture of the Old Summer Palace can be said to be a collection of ancient Chinese architectural art, its beautiful style, exquisite shape, crown the unique world. The cultural heritage it carries is incomparable to other buildings. She represents the highest wisdom of the Chinese nation in the field of architecture, and also contains the beautiful wishes for the unity of mountains and rivers and the peace of peace and peace of the people.

In this project, we carefully obtained the historical data and tried our best to restore the real Old Summer Palace in history. Although due to time and energy, technical means and historical integrity, achievements and the real Yuanmingyuan gap, but we believe that as long as the project can let more people look to the restoration and restoration work, we will always meet her new day, our team is also counted as a cultural inheritance. I hope that in the near future, we can find this national memory shared by every Chinese people, and feel the pulse of The Times that has passed through hundreds of years.

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