Application Research of Virtual Reality Technology in Rural Tourism Promotion

Shaoyu Liu

Sichuan Agricultural University, China

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Abstract: Tourism can adapt to the development of the network by nature, so once the virtual technology is developed, it will quickly infiltrate the tourism industry and serve it. In the context of virtual tourism, the application level and content of virtual technology in China's domestic travel websites are different. Virtual tourism technology is a bridge connecting intangible tourism products and tourists. The development of virtual tourism technology reduces the psychological burden of tourists' risks and uncertainties before traveling, and is an important channel for tourism marketing. Based on the characteristics of virtual reality technology, this paper expounds the advantages of using virtual reality technology in rural tourism, and then puts forward the application of virtual reality technology in rural tourism.

1. Introduction

Rural tourism is a form of tourism that takes the wild countryside as the environment, no one interferes with it, has no ecological damage, and is characterized by habitat and wild behavior. This form of tourism not only promotes the development of rural economy but also awakens the original residents to the ecological environment. Protection awareness. It is an important channel to help poor people get rid of poverty and get rich. However, the development of rural tourism has not been comprehensive compared to other modes of tourism so far, and promotion is not deep enough [1]. The use of virtual reality technology in rural tourism can provide travelers with a new way of experiencing geographical conditions and breaking through time boundaries, and inserting informational visualization wings for the development, promotion and publicity of rural tourism. The application of virtual reality technology in rural tourism plays an important role in promoting the development of rural tourism [1].

2. Virtual reality technology and rural tourism

2.1 Definition of virtual reality.

Virtual reality technology has many fascinating features, which come down to three things: interactivity, presence, and multi-perception.

1) Interactivity. Participants issue instructions to the virtual reality software through the input device, the virtual reality software accepts the instructions and intelligently interprets, and then updates the virtual world, rather than passively accepting information or merely acting as a bystander, as if viewing a three-dimensional animation [1].

2) On-the-spot. As participants interact with the virtual world, the virtual system places participants in an isolated environment due to the role of the helmet display, data clothing, and data gloves, and in this environment the participants head, hand, eyes, language and the movement of the body will make the image and sound in the virtual environment follow the change in real time [1]. Picking up the object can make the object move with the movement of the hand, and the sound of the three-dimensional simulation can be heard. The participants in the virtual environment, everything feels are extremely realistic and has an immersive feeling.

3) Multi-perception. Since the virtual reality system is equipped with sensing, sensing, and responsive devices, the user can obtain various perceptions such as sight, hearing, touch, and kines in the virtual environment, thereby achieving his or her presence [2].

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2.2 Definition of rural tourism.

Rural tourism refers to the main motivation of urban tourists to pursue physical and mental health, using high-quality rural natural ecology, characteristic health folklore and longevity groups to achieve a special leisure and holiday activities involving longevity, recreation and shaping [2].

3. The significance of virtual technology to promote tourism

3.1 Vividly display the scenery characteristics of the attractions.

Virtual reality technology can vividly simulate the environmental characteristics of rural tourist attractions, customs, history and culture, and can meet the needs of potential customers who are interested in rural tourism but do not travel in person, sightseeing, and knowledge. At the same time, the digital characteristics of the technology are conducive to vigorously publicizing rural tourist attractions through the internet and other channels, expanding the influence and reducing the cost of attraction promotion and promotion [3].

3.2 Conduct protective development of cultural relics that have disappeared or are on the verge of disappearing.

Because some historical relics and architectural sites have been destroyed and disappeared due to poor protection or are on the verge of disappearing, and the limited funds invested by the local government cannot be maintained and restored [2]. According to the picture or the description of the local people, virtual reality technology is used to restore and reproduce these historical relics and architectural sites with low input.

3.3 Bring real economic benefits to the local area.

Virtual reality technology can also be used in virtual tour guides, navigation maps, hotel reservations, etc. in rural tourist attractions, bringing real economic income to rural tourism. The immersive, interactive and predictive nature of virtual reality brings visitors a realistic experience of sensory channels such as feeling, touch and vision, and gains an immersive experience. This kind of paid virtual experience is also an important way to obtain economic resources from rural tourist attractions [4].

3.4 Tourism advertising.

In tourism propaganda, people have long used abstract concepts to express very rich tourism resources, such as texts, plans, brochures, and sometimes 3D animations, video discs, etc., but users are only passively accepted. Unable to fully and completely understand the information. The realization of virtual tourist attractions can provide tourists with accurate and detailed information. From the perspective of tourists, the user can “enter” the scenic spots to see and interact with each other. Before the tour, they have a clear understanding of the quality and cost of the scenic spots [3]. The interest of tourism encourages users to actually go to the destination to play.

3.5 Tourism planning.

With the help of the virtual travel system, the existing scenic spots that do not exist can be expressed. The interactive performance of VR can also be used to modify some scenes in real time, and the process of design and construction can be dynamically demonstrated and controlled in real time. Comparing various programs and results makes the designer's thinking more visual, the concept easier to understand, and easier for leaders to make decisions. This is something that traditional methods such as floor plans, renderings, sand tables, and even animations cannot achieve. In addition, the design can be modified repeatedly until the desired effect is achieved in virtual reality, so as to reduce or even eliminate the situation where the actual build effect deviates greatly from the design intent [2]. This will undoubtedly greatly improve the effectiveness of the design or planning department.

3.6 Teaching applications.

Virtual tourism can also be introduced into the education of primary and secondary schools. For example, when students study geography and historical knowledge, they are accompanied by relevant virtual tourism works. Students are learning and mastering knowledge in a live atmosphere like a game [3].

The teaching of the tour guide is more effective, the teaching scene is real, and the scene tour, student internship, etc. can be realized, and the teaching goal is achieved in the interaction. In addition, it can reduce teaching costs, save time and save costs.

3.7 Interactive entertainment.

All the tourist attractions in the world, one person can not go to the field to play, through the virtual tour can be addicted, users can stay at the scenic spots without leaving the house, and even interact in virtual tourism to increase entertainment.

4. Establishment of rural tourism virtual scene

At present, the process of applying virtual reality to the tourism industry is structural design, information collection, information digitization, virtual interaction design and implementation, product release, and ultimately virtual travel experience.

Tourist attractions can exist or not exist in reality. For real scenic spots, actual data and photos are collected. For the scenic spots in the planning, the planning plan is first designed, and it is made into a three-dimensional model according to the structural layout, and then the virtual interaction is utilized [4].

4.1 Virtual modeling technology.

The construction of a three-dimensional virtual scene model generally goes through several stages from design, modeling, mapping, scene synthesis, environment setting, animation, optimization, and model derivation. We use 3DMax as a modeling tool, because the model built by 3DSMAX has a strong simulation stereo effect, and it is convenient to import into the later virtual software to complete the interaction design [4].

1) Building modeling. Building modeling, such as the model with renderings, is not suitable. Each frame of the running image in virtual reality is calculated by the graphics card and the CPU in real time. If there are too many faces, the running speed will be drastically reduced or even impossible. Excessive number of model faces will also result in increased file size, and publishing on the network will also result in increased download time [4]. Therefore, the virtual tourism model uses a polygonal modeling approach.

The main advantages of polygon modeling technology is simple, convenient and fast, and saves the "face number" to meet the needs of virtual travel real-time display. In the design of virtual tourism works, not only the realism of the scenic spot, the feasibility of virtual interaction, but also the fluency of virtual tourism interaction should be considered. Considering the limitations of hardware and the real-time requirements of virtual reality systems, most of the models use techniques such as model segmentation and texture mapping [5]. Under the premise of ensuring visual effects, try to use relatively simple models. In the process of model creation, The model is segmented and modeled separately to facilitate the realization of virtual tourism.

2) Plant Modeling. Plants are important constituent elements of scenic spots. Plant models are complex and have a large amount. It is impossible to use conventional modeling methods. In addition to individual major plant models, most of them use plant maps for performance.

3) Water structure. The water body is also an important part of the landscape, such as a fountain, which can be expressed by a particle system, but it will reduce the speed of the system [5]. We only use the plane in the model design, attach the water body map, and the dynamic change of the water body to the later virtual software.

4.2 Optimization techniques.

Optimization of virtual scenes is an indispensable part. By adjusting and optimizing models and textures, the speed and fluency of the system can be greatly improved.

1) Model optimization. Divide the triangle faces of the object appropriately and delete the unwanted faces, lines, and points. Keep the distance between the surface of the model and the surface. When displaying the object of the slender strip, try to use the texture without using the model [5]. The number of models should not be too large, group objects, and the density of the model should be reasonably distributed.

2) Texture and material optimization. 3DS MAX's excellent texture mapping, material editing capabilities, provide a way to handle the surface material and texture of the model. Although there are scripts for changing the texture in the post-editing of virtual reality, if the surface material processing is completed in 3DS MAX, it will be much easier to enter the post-editor [6]. In addition, the use of materials sometimes needs to be combined with baking operations, different types of materials need to adopt different baking methods.

4.3 Virtual interaction technology.

Virtual tourism needs to have strong interactive performance. Users can easily interact with the system in three dimensions in the scene. In the later virtual software, scripts are used to control the interactive functions.

1) Camera settings. The camera is the human eye. In the virtual tour, the user roams in the scene as desired. These functions are realized by keyboard keys or mouse clicks. In later software, it is necessary to create a camera for different roaming modes and associate the camera with a button or mouse action. The creation of the camera should be combined with the design of the virtual tour, for example, the first person mode, the third person mode; the free roaming mode of the tourists, the automatic roaming mode. The automatic roaming of the prescribed route is a tour of the tourists according to the prescribed route. The scenery is fixed and orderly. This method is suitable for tourists who want to get a preliminary understanding of the landscape or are not familiar with the tourist destination [6]. The free roaming of tourists is a route for tourists to decide their own travel, free to walk, and there is no restriction on the travel route, so that tourists are more independent and entertaining.

2) Collision settings. Roaming in the scene should be in line with the convention. No matter whether you walk in a certain way, you will not go to other places outside the scene or fall into the building. This requires the system to judge the collision between objects in real time and accurately, and make a reasonable response [4]. The collision of the object is set in the post-virtual software, select the object that the camera will collide, and set the relevant parameters.

3) Multimedia effect settings. Provide navigation maps in the virtual tour system to help visitors understand where they are, or select the places they want to go by map. In the virtual scene, it is also possible to appropriately increase the number of active characters, small animals, etc., to simulate the effect of real tourism.

5. Application of virtual reality technology in rural tourism promotion

The use of virtual reality technology in rural tourism refers to the establishment of a realistic tourism landscape, using virtual reality technology to create a three-dimensional virtual world that transcends reality by realistically simulating realistic scenes. You can enjoy the beauty and feel the local culture in the built rural tourism virtual reality system.

According to its characteristics, there are several ways to apply virtual reality technology in tourism.

5.1 Virtual existing rural tourist attractions.

Virtual reality technology through the process of modeling, mapping, rendering, baking and so on. Really reproduce the local climate characteristics, mountains and rivers, and establish a virtual reality

system for rural tourism. Through this virtual tourism system, tourists can visually and vividly see the various tourist landscapes, giving visitors a feeling of being immersive. This application is a virtual tour of the existing landscape [7]. This kind of application has played a role in tourism propaganda, expanding the influence of scenic spots, and attracting tourists. The virtual tourism system can also largely satisfy the needs of those who are interested in rural tourism, who have not visited the tourist attraction or who have no ability to visit the tourist attraction, to appreciate the history and culture.

5.2 Virtually envisioned rural tourist attractions.

Virtual reality technology can simulate existing physical landscapes or realistically virtualize unfinished attractions in the expected phase. In response to this feature, virtual reality technology integrates the attractions that are still under planning and construction into the virtual tourism system. Through this system, people can enjoy the immersive landscapes and enjoy pre-promotion before the landscape is built [7]. The role of attracting tourists and satisfaction surveys, according to the feedback from tourists in the virtual tourism system, further modify or reconstruct which scenic spots are unreasonable and the tourist satisfaction is not high.

5.3 Reappearance or legendary cultural sites.

Due to historical reasons, some of the scenic spots or monuments in the countryside have been damaged and destroyed. Reappearing these disappearing spots and monuments can satisfy the curiosity of tourists, and also help visitors to learn about local history and increase their knowledge. Give tourists a nostalgic mind to some degree of comfort [7]. For example, the disappeared Loulan Ancient City, based on literature, legends, and historical records, through realistic virtual reality technology to construct realistic mountainous landscapes, street buildings, character costumes, and then combined with human landscape information, through the virtual reality technology to make the history of the ancient city of Loulan Landscapes and natural scenery can be preserved in another way, and enable future generations to revisit this singular tourist landscape through virtual tours in the years when they no longer exist, to experience the prosperous ancient Loulan culture.

6. Summary

As one of the advanced, application-oriented and most practical high-tech, virtual reality technology has greatly improved the development of related industries. Rural tourism is a new type of tourism that is different from traditional tourism. The development of the aspect is still in its infancy. Applying the most advanced virtual reality technology to rural tourism will also greatly promote the development of rural tourism.

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