Research on Interactive Visual Experience Design of Intangible Cultural Heritage Based on VR Technology

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Abstract. Under the background of the rise of the intangible cultural heritage industry, it is necessary to fully combine the virtual reality technology to improve the vision of the interactive intangible cultural heritage. Using VR technology can enhance the visualization of intangible cultural heritage visual model, according to the design requirements of interactive intangible cultural heritage vision, virtual reality technology adopts system integration technology to collect data information in interactive intangible cultural heritage vision and key models, in order to improve the experience of interactive intangible cultural heritage. System integration technology mainly includes data synchronization, data calibration, data conversion, data management, data synthesis, etc. The main purpose of this paper is to study the application of VR technology to provide multiple development paths for the interactive intangible cultural heritage visual experience, and to create a high-quality visual experience for the intangible cultural heritage through the flexible design.

Keywords: VR Technology · Interactive · Intangible Cultural Heritage Visual Experience · Design

1 Introduction

Virtual reality technology (VR) is a computer simulation system that can create and experience the virtual world. It uses the computer to generate the simulation environment and immerse users in the virtual environment [4]. Virtual reality technology is a phenomenon that people feel by using the data in real life, the electronic signals generated by computer technology and various output devices [15]. The objects that can be heard in reality can also be substances that can not be seen by our naked eyes, which can be expressed through three-dimensional models. This phenomenon is not what we can see with our own eyes, but the real world simulated by computer technology, so it is called virtual reality [14] (Fig. 1).

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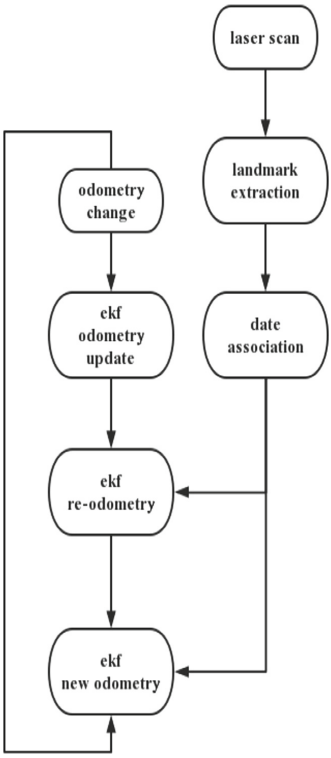

Fig. 1. Structure of intangible cultural heritage visual interaction system.

2 Design Advantages of VR Technology

2.1 Create a Diversified Learning Platform

VR technology creates a variety of presentation modes in the design of interactive intangible cultural heritage vision [17]. Because the form of intangible heritage is generally single, mainly to publicize the production technology, but it can not be well integrated with modern society [10]. Moreover, many intangible cultural heritages have complex processes, excellent production and complex types, so that the inheritors need to spend a lot of energy and financial resources to complete them [13]. The periodicity is long and the production is slow, which can not meet the market demand, so they will face the phenomenon of loss [18]. If the inheritor uses VR technology, it can not only control the production cost, but also make the teaching method of intangible cultural heritage easier to understand and speed up the pace of inheritance [7]. The virtual model of VR can help intangible cultural heritage workers observe and learn works more intuitively and comprehensively, stimulate users' learning enthusiasm and improve their practical ability [16].

2.2 Breaking Space Boundaries

Many intangible cultural heritages are faced with the problems of no one learning, difficult technology and long effectiveness in the process of inheritance. Moreover, some intangible cultural heritages do not have considerable economic benefits, and some even need subsidies from intangible cultural heritage workers.In this case, it is difficult to attract inheritors [6]. Even if you succeed in learning, you can't stick to it for a long time because of various life and economic pressures [5]. Moreover, due to the strong regional nature of intangible heritage, without a lot of publicity, people can not understand this art, and then it will gradually decline. In order to meet the development direction of modern society, intangible cultural heritage needs to break the shackles and move to a new stage [2]. VR technology can combine the characteristics of intangible cultural heritage and make use of the advantages of virtual reality technology to help intangible cultural heritage get out of the restrictions, make more people understand intangible heritage and better protect intangible culture [1].

2.3 Key Technologies of Virtual Reality

2.3.1 Real Time 3D Graphics Generation Technology

The generation technology of 3D graphics has been relatively mature, so the key is "real-time" generation. In order to ensure real-time, at least ensure that the refresh rate of graphics is not less than 15 frames/s, preferably higher than 30 frames/s.

2.3.2 Stereoscopic Display and Sensor Technology

The interactive ability of virtual reality depends on the development of stereo display and sensor technology. The existing equipment can not meet the needs [11]. The research of mechanical and tactile sensing devices needs to be further deepened, and the tracking accuracy and tracking range of virtual reality equipment need to be improved [9].

2.3.3 Application System Development Tools

The key to the application of virtual reality is to find suitable occasions and objects. Selecting appropriate objects can greatly improve production efficiency, reduce labor intensity and improve product quality [12]. To achieve this goal, we need to study the development tools of virtual reality (Fig. 2).

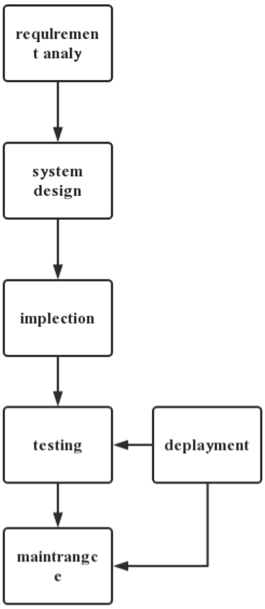

Fig. 2. Construction of intangible cultural heritage virtual model.

3 VR System Design Structure

VR technology integrates real scenes and objects into the design of intangible cultural heritage visual experience. Combine visualization technology and system integration technology to build intangible cultural heritage production scenes, add the real experience of inheritors, and arrange the levels between various plates. In the production process of virtual scene, each plate is connected and interacted with each other, which fully ensures the authenticity of intangible cultural heritage scene [3]. The application of intangible cultural heritage virtual scene to intangible cultural heritage inheritance can help apprentices integrate into learning faster and feel the production and skills of intangible cultural heritage technology comprehensively and deeply. Quickly help the target object establish a learning system and improve the learning quality of technology [8].

Human computer interaction is carried out between virtual scenes and users. This interesting design highlights the flexibility and experience of intangible art inheritance. However, it also needs to be accurately combined with the production process of intangible cultural heritage technology in order to make the interesting design more perfect. In the virtual learning scene, the module design shall be carried out according to the actual operation and learning experience of the craftsman, and a variety of learning habits shall be designed to meet the personalized needs of users and improve the learning initiative of learners. The construction of virtual scene is to meet the needs of Intangible Cultural Heritage Inheritance, help inheritors learn quickly, and finally strengthen training with real scene to exercise users' thinking and operation ability. The model building of virtual

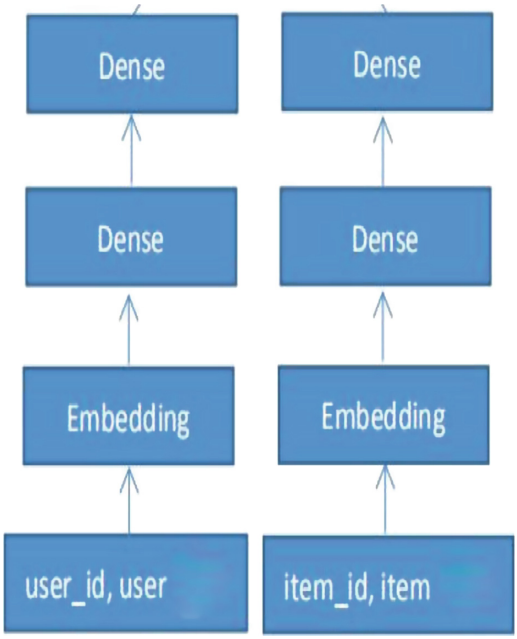

Fig. 3. Virtualization scenario computing.

reality technology creates a good bridge for the inheritance of intangible cultural heritage, fully combines with the modern development level, and promotes the high-quality development of intangible cultural heritage (Fig. 3).

4 Conclusion

The rise of intangible cultural industry further promotes the visual development of VR technology. VR technology continuously integrates key technologies into the design and optimization of intangible cultural heritage visual model, strengthens the experience sense of visual experience model, and makes the visual experience model more realistic. For example, dynamic environment modeling technology, the establishment of virtual environment is the key of VR technology system. The main purpose of application is to quickly obtain the three-dimensional data of the actual environment of intangible cultural heritage objects, and build the relevant virtual environment model according to the application requirements.

In the future development, VR technology will be constantly updated, and VR technology will get more mature development. Only in this way can intangible cultural heritage be presented to people in a diversified way and improve the visualization technology of intangible cultural heritage industry.

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