

IP Visual Design System of Grassland Silk Road Culture on Account of Intelligent VR Technology

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Abstract: Visual symbols belong to a comprehensive carrier, which contains artistic elements and often gives a deep memory image. This paper adopts intelligent VR technology to carry out IP visual design for grassland Silk Road culture, so as to sublimate the visual symbol of grassland Silk Road culture. Grassland culture contains many elements, such as joy, anger, sorrow and joy, moon on the grassland, etc., which are the artistic conception pursued by writers. The visual culture of the grassland has been strengthened over time. This paper studies the IP visual design system of grassland Silk Road culture on account of intelligent VR technology, introduces the relevant content and theory of grassland Silk Road culture, and explains the principle of IP visual design of this culture. Data analysis shows that the IP visual design system research of grassland Silk Road culture on account of intelligent VR technology has a very efficient performance in IP visual design.

1. Introduction

The medium of visual design is information, and the communication and notification of information are utilized to convey visual artistic effects [1]. Intelligent VR technology is adopted to carry out visual design of grassland Silk Road culture, which enhances the historical value of grassland Silk Road culture. The steppe silk Road culture is the historical and artistic symbol of the Mongolian nation for many generations, and its intrinsic value deeply affects people's mood. In this paper, intelligent VR technology is used to display and render the grassland Silk Road culture [2]. The research on IP visual design system of grassland Silk Road culture on account of intelligent VR technology is conducive to improving the IP visual experience of grassland Silk Road culture.

On the research of intelligent VR technology, many scholars at home and abroad have carried out research on it. In foreign studies, Matthews T argues that virtual reality (VR) has gained increasing adoption and support in healthcare training, but efforts are still needed to alleviate usability concerns. Methods: This study conducted a usability study on an active emergency medicine virtual reality training application that can be used on commercial virtual reality hardware and has a standard interaction design. Results and Conclusions: Our results show moderate (and potentially best) workload and an above average system availability score [3]. Shieh Y Y proposed

that the purpose of the study was to use a fixed effect model to study the relationship between the characteristics of participants in vocational rehabilitation and national economic conditions, defining measurable skill gain (MSG) under the Workforce Innovation and Opportunity Act (WIOA). The findings suggest that there appears to be a large fixed effect on data from vocational rehabilitation (VR) programs. Predicted MSG rate results show inconsistent values in some states [4]. Kostis A presented case evidence of how virtual reality digital artifacts can support enterprises to effectively implement custom solutions in robotics and automation projects. The adoption of new digital co-creation practices redefines the traditional client-provider role in industrial co-creation, increasing participation, reducing uncertainty and improving project outcomes [5].

Visual design is a very important video design method, this paper using this method, one of the intelligent VR technology to abstract, grassland silk road culture, again, this image of steppe silk road culture can visually show in front of people, so intuitive image to show the dynamic image of its history, so as to reveal the historical and cultural thick and beauty [6-7]. The research on the grassland Silk Road cultural IP visual design system on account of intelligent VR technology is conducive to the innovation and progress of cultural IP visual design.

2. Design and Exploration of IP Visual Design System of Grassland Silk Road Culture on Account of Intelligent VR Technology

2.1. Intelligent VR technology

Intelligent VR technology is the use of computer simulation to produce a three-dimensional virtual world, providing users with visual, auditory, tactile and other sensory simulation, so that users as immersive, can timely, without restrictions to observe things in three dimensional space.

Dynamic environment modeling technology adopts the sample data in the environment and constructs the virtual environment model according to the real needs [8-9]. Three dimensional data acquisition in two ways, one, the use of CAD, the other, the use of non-contact visual technology. If the above two can be combined together, the effect of data can be improved. The technologies used can be divided into several aspects, as shown in Figure 1.

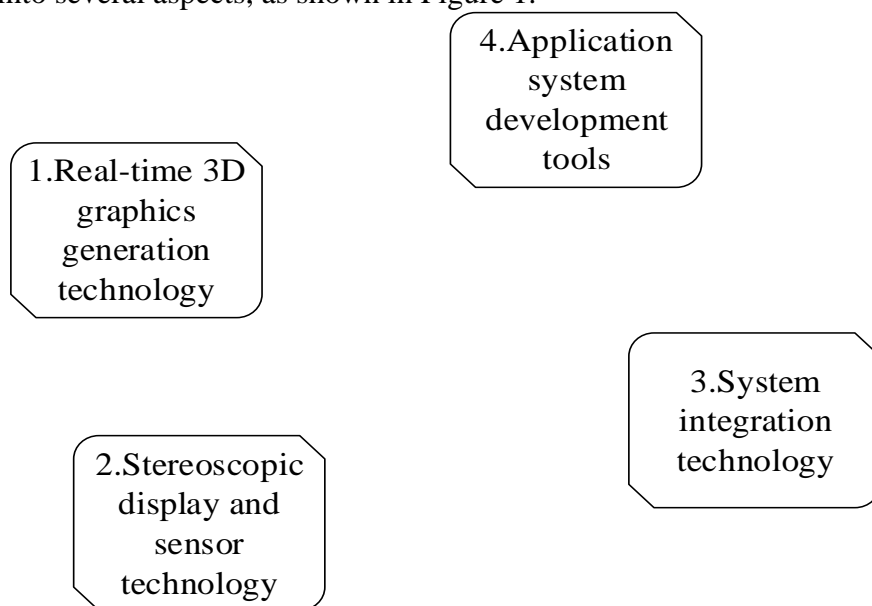


Figure 1: Specific division of the use of technology

First, real-time 3D graphics generation technology

3d graphics generation technology has been mature, the key is how to achieve "real-time" generation [10-11]. For real-time purposes, ensure that the graphics refresh rate is at least 15 frames per second and preferably 30 frames per second. How to improve the refresh frequency without reducing the quality and complexity of graphics will be the research content of this technology.

Second, stereoscopic display and sensor technology

Virtual reality data communication needs to adopt stereoscopic display and sensor technology. VR is far from meeting current needs, such as slow response, poor resolution performance, narrow utility range, use defects, etc.; The positioning technology of virtual devices needs to be further improved, so 3d display technology needs to be developed.

Third, application system development tools

The application of virtual reality is very necessary to create appropriate scenes and targets, how to fully create environmental conditions, and how to completely enhance innovation [12-13]. Greatly improve the production efficiency, weaken the use of strength, improve the quality of the system. There is an urgent need to create virtual reality systems.

Fourthly, system integration technology

Because virtual reality includes a lot of perceptual information and models, system integration technology plays an important role. Integration technology includes information synchronization technology, model calibration technology, data conversion technology, data management model, recognition and synthesis technology.

2.2. Research on IP visual design system of Grassland Silk Road Culture on account of intelligent VR technology

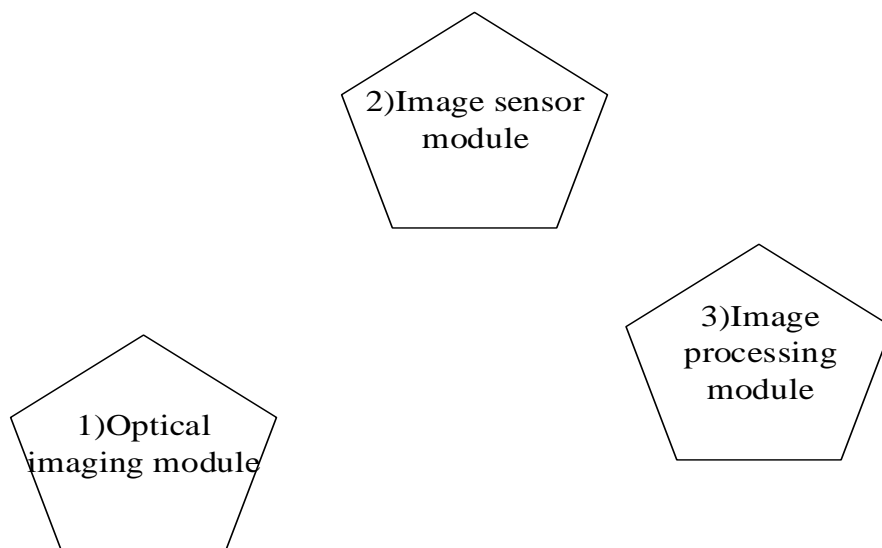


Figure 2: The structure of the system can be specifically divided

The structure of the system can be specifically divided into the following aspects, as shown in Figure 2:

(1) Optical imaging module

The module is divided into a daylighting system and a mirror optical system. The lighting system obtains the optical characteristics, band, target and background of the measured object by detecting light wave, adjusts the color, intensity, uniformity, shape and light path of the detected light wave, and finally obtains relevant information of the target [14-15]. The mirror optical system mainly relies on the lens, carries on the projection to the target, and carries on the adjustment to the light

parameter, the range threshold correction. Finally, after determining the information of the measured object, the data is stored in the cache.

(2) Image sensor module

The function of this module is to collect the information and transmit the photographic data of the target. This module is generally at the rear of the lens, which is mainly divided into CCD charge-coupled components and CMOS components. The key part of this module is to design a stable circuit to stabilize the signal of the image sensor.

(3) Image processing module

The function of this module is to process and process the image data, and finally obtain the required image data processing results. This module deals with the related data of image information, which is mainly divided into hardware and software. Hardware refers to the electronic component systems associated with the CPU. PC machine mainly processing image related content components. The software includes some of the image processing code, but also includes related algorithms, data transplantation and so on.

3. Research on the Effect of IP Visual Design System of Grassland Silk Road Culture on Account of Intelligent VR Technology

SURF uses integrals to operate on images and adopts the measure of a matrix to perform the checking algorithm [16-17]. Assuming that a specific point in graph I(X) in VR is represented by X = (X,y), the algorithm formula $I_{\Sigma}(X)$ of integrated image is as follows:

$$I_{\Sigma}(X) = \sum_{i=0}^{i \leq x} \sum_{j=0}^{j \geq y} I(i, j) \quad (1)$$

SURF feature points often have many information, such as specific orientation, measurement degree, direction, vector and so on. The nearest neighbor method is used to coordinate the graph. The Euclidean distance is used to represent the similarity of images, and the Euclidean distance equation can be expressed as:

$$OP = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2} \quad (2)$$

Where, x_1 , x_2 , y_1 and y_2 represent the coordinates of points.

When orthographic projection is carried out on the image, a stereo image will be generated at this time. The similar pixel coordinates of the image (x,y,z) and the pixel coordinates of the panoramic image (s,t) are represented, the radius of the cylinder is represented by R, and the height is represented by H. Then the image pixel (x,y,z) can be obtained:

$$\begin{cases} x = r \cos \frac{2\pi s}{S \text{ width}} \\ y = r \sin \frac{2\pi s}{S \text{ width}} \\ z = \frac{(S \text{ height} - t)h}{S \text{ height}} \end{cases} \quad (3)$$

Using intelligent VR technology, the IP visual design system of grassland Silk Road culture collects samples of grassland Silk Road culture, initializes them, and then extracts features of

grassland Silk Road culture to form feature sets. Finally, the visual design of the feature set makes the grassland Silk Road culture more intuitive.

3.1 Characteristics of grassland Silk Road culture

(1) Common theme of expression

Among the bronze culture families of Eurasian steppe, ordos bronze ware is the representative type of Mongolian plateau, which is directly related to the animal style of bronze ware of Russia, Ukraine and Hungary. Originally is the European scholars found out baikal region m LuoXiSiKe basin discovered bronze animals style with the modelling of erdos bronze ware and decorative style of similarity, as the world's grassland semicircle band provides such a special environment of the earth's surface and horseback national commonality, so have the culture with worldwide coverage and convergence.

(2) Periodic cultural colors

Grassland people take climate as the cycle, and pay attention to the characteristics developed in such natural conditions and social environment. As time goes by, the cyclical customs extract the characteristics of visual symbols of grassland culture. Across Eurasia, the collision between the periodicity of grassland culture and farming culture plays unique notes from time to time in the vast Chinese artistic tradition. The color of grassland culture is formed in such a state. Therefore, in artistic expression, it always imitates the perceptual images of concrete things in nature and social life, but in the end, it is not just stuck to the images, but the cultural characteristics formed by blending with the abstract perceptual knowledge.

(3) Strong ideological atmosphere

In terms of the rock paintings widely distributed in the northern grassland, the ancients were often created by intense feelings, and their content was mostly mask rock paintings, dance rock paintings, hunting rock paintings and other works to charm and entertain the gods. If the masks in the rock paintings are regarded as the products of nature worship, the stone statues and deer stones in the shepherd's cemetery are the testimony of ancestor worship, which is closely related to the special ideology of primitive society. The birth of primitive social ideology was on account of the ancient people's worship of natural spiritual power, which was popular among all the nomads in the northern grassland, which can be confirmed by the art works of various ethnic groups in various regions.

4. Investigation and Research Analysis of IP Visual Design System of Grassland Silk Road Culture on Account of Intelligent VR Technology

In order to verify the proposed effect of applying intelligent VR technology to IP visual design of grassland Silk Road culture, this situation is now verified. The intelligent VR technology, fractal algorithm and particle filter algorithm used in this paper are compared in the test effect. Now 1200 IP visual samples of grassland Silk Road culture are used for testing, and these images can constitute a series of images.

The software used this time is VS2010, the memory is 128G hard disk, and the processor is Intel Core i5-3322. The operation data are shown in Table 1.

Table 1: Grassland Silk Road Culture IP visual design test data

Number of images	Intelligent VR technology		Fractal algorithm		Particle filtering algorithm	
	memory/MB	time/s	memory/MB	time/s	memory/MB	time/s
5	15.34	4.5	17.56	5.6	19.34	7.9
10	21.45	5.5	27.67	6.7	38.45	11.4
20	33.54	8.7	48.82	10.2	48.65	17.3
40	42.32	15.6	78.32	19.2	75.54	31.32

Table 1, there are three algorithms, namely Intelligent VR technology, Fractal algorithm and Particle filtering algorithm. When the number of sample images is 5, 10, 20, and 40, the memory consumption and time spent are shown in the table. Intelligent VR Technology consumes the least memory and takes the least time.

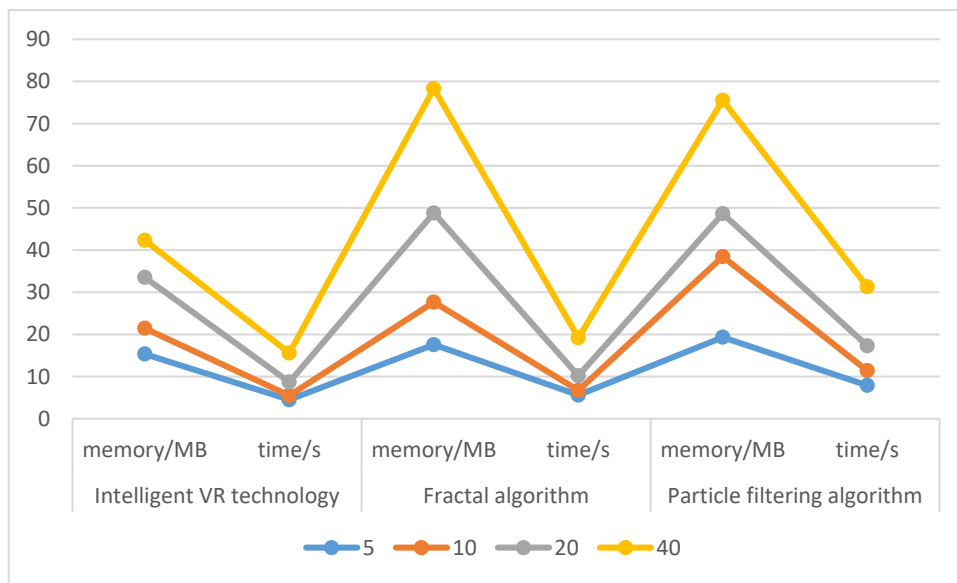


Figure 3: IP visual design illustration of Grassland Silk Road Culture

Figure3 shows three algorithms: Intelligent VR technology, Fractal algorithm, and Particle filtering algorithm test the operation parameters of 5, 10, 20, and 40 images. As can be seen from the figure, the line of memory consumption of Intelligent VR technology is lower than the line height of other two algorithms, and the memory consumption is less. The consumption time line is also lower than the other two algorithms and consumes less time. Therefore, Intelligent VR technology is more efficient.

The data test shows that the research of grassland Silk Road cultural IP visual design system on account of intelligent VR technology is more efficient and efficient in the visual design of grassland Silk Road cultural IP.

5. Conclusions

The image memory and image symbols of the grassland Silk Road culture can be felt by people up to now. The culture and art of the grassland Silk Road is an essential visual symbol for the development of human civilization. Scholars use intelligent VR technology to extract features of the grassland Silk Road culture and visually display the culture, so that people can feel the charm of grassland culture more. Research on IP visual design system of Grassland Silk Road culture on account of intelligent VR technology, which has efficient performance in IP visual design of grassland Silk Road culture.

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