Digital media 3D virtual visual interface design application e mbodiment

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Abstract. In the steady development of social economy, the form and content of visual communication design under the digital media technology are more and more rich, and the overall expression style presents a diversified development trend, which has an impact on the transmission of visual information in the new era. Nowadays, digital media technology, as the main media and technical support for visual communication design, not only expands the design resources and development space, but also visually presents rich visual information to the public. Therefore, on the basis of understanding the research status of 3D virtual visual interface design and according to the development trend of digital media technology, this paper mainly studies 3D virtual dynamic reproduction design with large digital media as the core. The final experimental results show that the practical design and application methods meet the needs of industry development in the new era.

Keywords: Digital media; Three-dimensional virtual; Visual interface; Visual information; Visual communication

1. Introduction

Nowadays, all kinds of websites in China mainly regard digital technology as the basic conditions, quick visual communication as the development goal, the good experience of customers as the research core, pay more attention to the creation of advertising media to attract the eyes of the audience, guide the visual communication design towards the direction of digital and intelligent steady development. With the continuous improvement of our social economy and science and technology, digital media technology has been rapidly developed, and each industry innovation research provides more opportunities. The application of digital media technology in the field of three-dimensional virtual visual interface design can not only help the staff to integrate traditional art and animation creation, and develop more high-quality three-dimensional animation works, but also can deeply integrate all kinds of art levels, and speed up the development of Chinese art and culture innovation. [1-3]

In essence, digital media is one of the new media technologies with network technology as the core. It can use binary digital language to spread and present knowledge, and has a very wide range of practical applications, both in business and art and culture, showing strong application value. The direction of practical application is shown in Figure 1 below:[4-6]
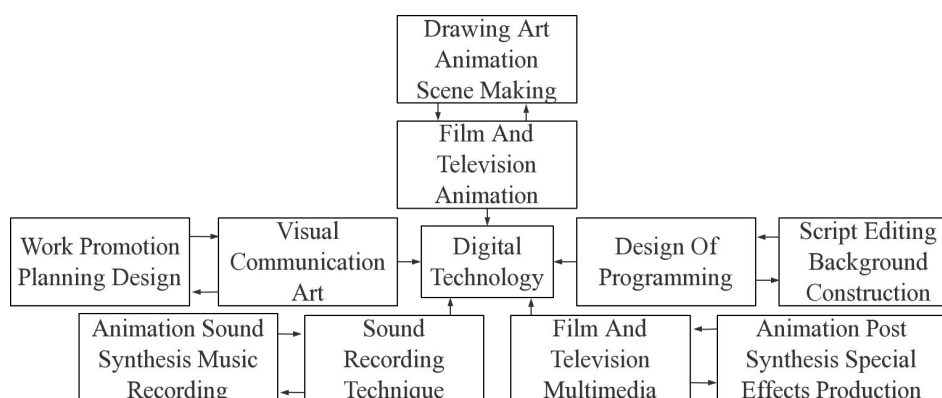

Figure 1 Application direction of digital media

Bas ed on digital information technology research and innovation digital media technology theory, under the guidance of culture and art, the public is regarded as the media communication information, which can not only accelerate the development of information technology, but also provide good technical support for the development of digital media industry, and truly meet the spiritual needs of the public. 3D animation, also known as 3D animation, mainly uses computer software technology to complete animation modeling in virtual space, and ultimately creates multi-dimensional and three-dimensional animation effects. After the modeling is completed, lighting and other elements are added for rendering processing to simulate the technical actions in real life, which can form a more complete animated video. Nowadays, the field of 3D animation contains many fields of knowledge and technology, with extremely high modeling accuracy and application effect, which is the main problem discussed by researchers. [7-9]

According to the accumulated experience of 3D virtual visual interface design in recent years, the reasonable application of embodied digital media has the following advantages: First, it enhances the authenticity of virtual creation. Traditional media communication technology can fully reflect the visual, auditory and other comprehensive cognitive information, while digital media technology can transform audio, video, text and other information into information form, on the basis of effective conversion to ensure that the information becomes more concrete, which helps people to have the feeling of being in the scene when watching. For example, in recent years, the Spring Festival Gala shows combine the real scenes and background images of the actors, presenting a more wonderful visual experience for the audience; Secondly, it presents the interactivity of visual communication. The biggest advantage of digital media technology is its strong interactivity. A good communication bridge can be built between the media industry and the audience, which helps the audience to get more wonderful feelings in the visual experience. This kind of visual communication effect needs the active participation of audience groups, which can have a deeper understanding of the individual needs of different groups, and provide effective basis for the following technical research. In addition, digital media technology can break through the restrictions of traditional visual communication, and the target of visual communication is widely transmitted to various fields. Finally, improve the comprehensiveness of communication technology. From the perspective of overall development, digital media technology can change the single characteristics of traditional visual communication design, organically combine text, pictures, video, animation and other elements together, present the visual communication design concept from a multi-dimensional perspective, and finally truly meet the aesthetic needs of different audience groups. On the basis of understanding the development status of 3D virtual visual interface, design and digital media technology, this paper puts forward a 3D virtual dynamic reproduction design with large digital media as the core, and combines with relevant experiments for verification and analysis. The final results show that the whole design application can reproduce the high-precision 3D model in a short time.

2. Methods

2.1 Virtual Dynamic Segmentation

Firstly, the image segmentation algorithm is optimized. The application accuracy of segmentation algorithm is improved by using relevant technical theories. The dynamic image is segmented into disjoint sets, and each set represents a uniformly distributed region. Since the union of any two adjacent regions cannot be evenly distributed, the image segmentation region should be quickly obtained according to the formal definition of image segmentation.

Secondly, color features are extracted. In the virtual dynamic image, all the objects have certain properties, and the color features are represented in the pixels. The histogram of the color image can be used to represent the straightness of the brightness distribution in the virtual dynamic image. The image contains the number of all brightness pixels, which can scientifically adjust the brightness changes of the image according to the information distribution of the color histogram.

Again, the image texture is extracted. Texture elements and their arrangement can be divided into two forms, one is regular arrangement, the other is irregular arrangement, generally using autocorrelation function and gray difference statistics two ways to process. [10-12]

Finally, image processing. In this work, in order to accurately calculate the weight value between pixel points, it is necessary to establish the relationship between image and virtual dynamic image, and use the theoretical knowledge of graph to effectively process, so as to complete the virtual dynamic image segmentation.

2.2 Virtual Dynamic reproduction

In 3D virtual dynamic reproduction, using large digital media technology to improve the image segmentation effect, we should first add a class of nodes, which are mainly used to mark the categories of pixels, and finally use minimum segmentation to complete 3D virtual dynamic reproduction. After mastering all pixels of the virtual dynamic image, it is mapped into the S-T network system structure as shown in Figure 2 below:
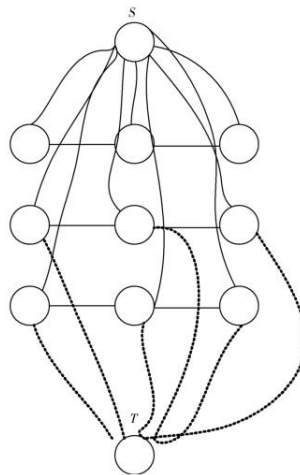

Figure 2 S-T network system structure

According to the analysis of the above figure, S represents the source point and T represents the convergence point. All pixel points can be divided into two forms, one refers to the edge connected to S, the other refers to the edge connected to T. The weight value of each edge can directly reflect the color difference of pixel points in the foreground and background, and finally the image processing can be completed through the minimum segmentation.

After building the energy model, the whole process of analysis should be simplified, the pixels of the foreground and background of the image should be clarified, each Gaussian component should be obtained, and the specific gravity of each Gaussian component should be calculated and analyzed to obtain the expression formula of the Gaussian mixture model. After introducing a new energy function, the formula as follows can be obtained:

$$E(S) = |S|.H(\theta^S)$$

In the above formula, (θ^S) represents the histogram of the target S, H represents the probability distribution function, and E (S) represents the new energy function. The overall number of calculations is relatively small.

After completing the construction and analysis of the energy model, the 3D virtual dynamic image structure should be reproduced, the probability of foreground and background of pixels should be accurately calculated, and the Gaussian component of the energy model that pixels belong to should be judged and analyzed according to the weight values of S and T. At the same time, the graph structure should be constructed according to the value of the side weights connected by S and T to complete the dynamic reproduction. The specific reproduction process is shown in Figure 3 below:
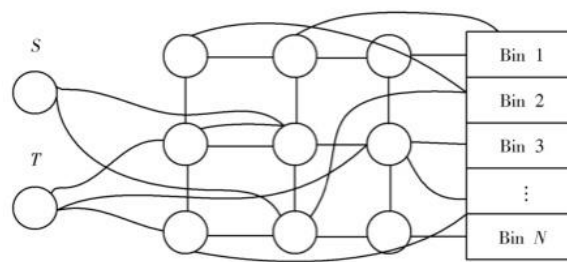
Figure 3 Flow chart of dynamic reproduction

3. Result analysis

3.1 Experimental Results

In combination with the 3D virtual vision dynamic reconstruction method proposed above and the traditional 3D virtual dynamic reconstruction method, Windows 7 is regarded as the operating system and the development environment is Microsoft Visual Studio2017. In the field of 3D virtual dynamic reconstruction, the effect of Chongqing is evaluated by combining subjective and objective methods. In the evaluation work, the staff should focus on observing the integrity of the reconstructed target, judging and analyzing whether there is undersegmentation of the reconstructed structure, researching and discussing whether the edge of the target is smooth, and whether there is no reproduced structure. Among them, the comparison of the recall rate of the two is shown in Figure 4, the accuracy is shown in Figure 5, and the numerical change of F-measure is shown in Figure 6:
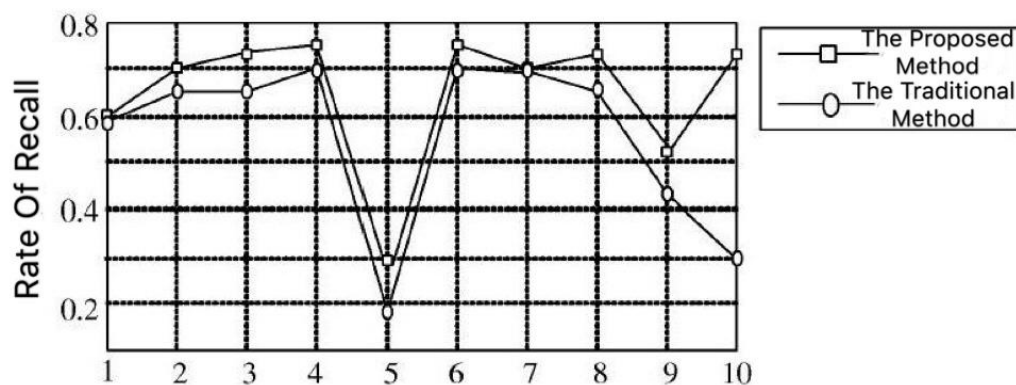

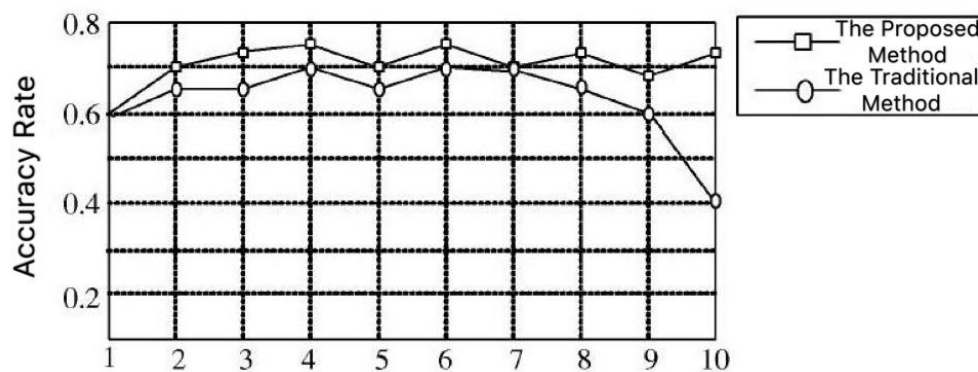Figure 4 Comparison results of recall rates

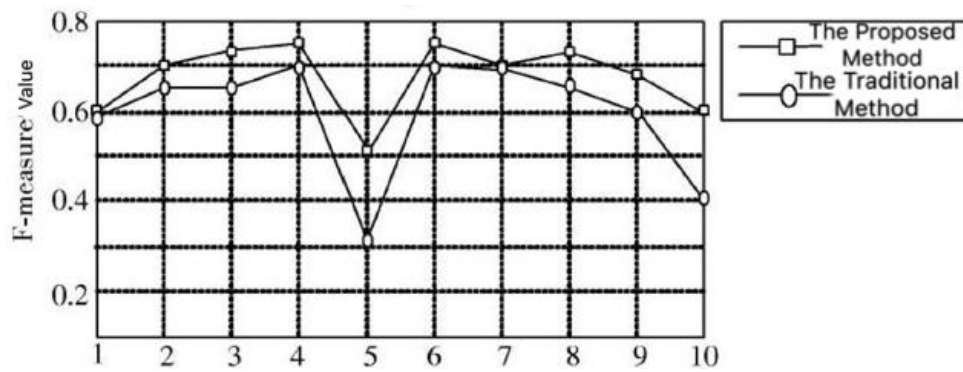FIG. 5 Comparison results of accuracy

FIG. 6 Comparison results of numerical changes of F-measure

Based on the analysis of the figure above, it can be seen that the recall rate, accuracy rate and F-measure value of the three-dimensional virtual dynamic presentation method designed in this paper with large digital media as the core reached 2.054%, 5.264% and 3.652% respectively. The final result proves that digital media technology has a unique advantage in the application of 3D virtual vision mirror design, and the 3D virtual dynamic rendering effect has reached the expected goal.

3.2 Development Proposals

In order to reflect the unique value of digital media technology in 3D virtual visual interface, we should start from the following points of innovation and development in the future: First, speed up the pace of software processing technology innovation. With the steady development of 3D technology in Chinese digital media, more and more commercial software has been applied in TV and film industry, the production cost of 3D film and television works has been effectively controlled, and the appreciation value of works has been steadily increased. However, from the perspective of overall development, there are many problems in the application of some commercial software in our country, which cannot meet the demands of creating different 3D animation works. Therefore, scientific research scholars should strengthen the theoretical research of technology, pay attention to accelerating the pace of software processing technology innovation, and pay attention to providing the basic guarantee for the development of 3D digital media technology. Secondly, strengthen the cultivation of professional talents. In order to present better 3D animation production effects, 3D virtual visual communication design should pay attention to the training and innovation of professional and technical talents on the basis of changing the traditional concept. Nowadays, when training professionals in 3D animation, it is mainly popularized by the way of education in colleges and universities. However, due to the lack of professional infrastructure and insufficient teachers in each stage of practice teaching, 3D animation teaching has not achieved good results. After entering the era of big data, on the basis of strengthening communication and cooperation relationship, Chinese government departments and universities have built a good education training system, gradually get rid of the restrictions of the traditional education model, not only optimize the talent training mechanism in colleges and universities, but also gradually improve the talent incentive mechanism, which lays the foundation for promoting the development of the three-dimensional industry of digital media. Finally, actively create a good competitive environment. Nowadays, the technology in the field of three-dimensional animation is developing faster and faster, and a more perfect management system has been established. However, from the perspective of long-term development, there is vicious competition in the animation industry market, and enterprise managers have not established the perfect supervision and management mechanism, which directly limits the development pace of Chinese digital media three-dimensional animation industry. Faced with this problem, Chinese government departments and animation industry gradually strengthened the level of supervision in the market field and paid more attention to creating a good competitive environment. [13-15]

Conclusion

To sum up, in the process of technological innovation and development of digital media, 3D virtual visual interface design, as a new form of artistic expression, has gradually got rid of the restrictions of traditional technical theories and presented better products and services for the audience. Therefore, Chinese scholars should continue to study and show the unique advantages of digital media technology in the application of 3D virtual vision interface design, so as to accelerate the development of 3D virtual vision field.

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