Application of Computer Animation Design Technology in Taijiquan Internet Communication

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Abstract. With the popularization of computer animation techniques in the application fields, traditional cultural communication modes are gradually combined with modern computer animation techniques to develop new communication modes. As a cultural brand of the Chinese nation and treasure of Chinese martial arts, Tai Chi, is a precious cultural resource in our country. Through the analysis of computer animation techniques and traditional cultural communication modes, a communication mode for Tai Chi culture based on computer animation techniques is proposed, which plays a certain guiding role in the communication of Tai Chi culture.

Keywords: Computer Animation Techniques, Tai Chi Culture, Tai Chi, System Design

1. Introduction

Computer Animation (Computer Animation), also known as computer graphics, refers to the use of graphics and image processing techniques, with the help of programming or animation software to generate a series of scenes, is the use of computer animation techniques [1-2]. It is a subfield of computer graphics and animation. Today, computer animation techniques are widely used, such as making applications more vivid or adding multimedia sensory effects; for game development; television animation production; creating attractive advertisements; special effects in film production; simulation of production process and scientific research, etc. It has gradually become the carrier and application tool of today's social and cultural communication [3].

Chen's Tai Chi was created by Chen Wangting, Chenjiagou, Wenxian County, Jiaozuo, Henan, and is a shining gem in traditional Chinese martial arts. The development of Tai Chi cultural industry has been blossoming everywhere, but it lacks the support of strong brands. It needs an iconic symbol that is popularized in the popular cultural symbols of the general public by means of modern media, and the iconic cultural symbol must be a typical art work of different cultural periods [4-5]. HENCE, it is imperative to build an integrated and superb Tai Chi animation cultural brand, which will have a sensational effect in society and enable a key breakthrough in Tai Chi cultural brand construction [6].

In this paper, the computer animation techniques and traditional cultural communication modes are analyzed, and a method for Tai Chi cultural communication based on computer animation techniques is proposed, which plays a certain guiding role in Tai Chi cultural communication.
2. Development direction of computer animation techniques

Animation techniques is one of the products of the development of high-tech techniques. The cornerstone of animation techniques is computer techniques and information techniques. It was not originally derived from the animation industry. With the popularity of the Internet, the rapid development of computer techniques and information techniques, these new technologies gradually Absorbed by the animation field, it has become the key and foundation of modern animation techniques (such as CG techniques), which has greatly promoted the development of animation (such as 3D animation) and expanded the extension of animation (such as online interactive games). Its development has experienced from The process of traditional frame-by-frame production to computer two-dimensional animation, and now to three-dimensional animation.

Driven by the rapid development of science and techniques, the animation industry is undergoing a transition from a traditional animation industry led by “image” to a large animation industry ecosystem led by “techniques”, and 3D animation has become the mainstream of development. Computer animation techniques The development of the company mainly revolves around two aspects.

One is to pursue better results. Through sports (such as bones, skin, muscles, deformation, expression, mouth shape, cloths, fluids, dynamics, hair, collision, etc.), rendering (layering techniques, cluster rendering, network rendering, etc.), special effects (particle system, group techniques, etc.) technical research to achieve a more perfect visual art effect, and establish corresponding plug-ins and callable databases (action library, expression library, material library, etc.) to facilitate the application of the technologies.

The second is the pursuit of higher efficiency. The application of early animation layering techniques is the pursuit of efficiency, and the same is true of the interpolated key frame drawing division. 3D animation production has a unique advantage in efficiency, eliminating the traditional 2D animation Heavy work in intermediate painting, coloring, etc., steps such as motion and rendering can be completed continuously and can be modified repeatedly, but now there are still many bottlenecks in 3D animation production in terms of motion control techniques and rendering techniques, which needs to be further developed and improved.

3. Virtual reality analysis of Tai Chi

The application of virtual reality (VR) techniques in Tai Chi research can be expressed in three aspects: sports training, physical education, and mass sports activities. VR techniques can provide a complex and changeable external environment during the training process, and can be easily obtained by simulating the external environment. It is especially suitable for the improvement of Tai Chi practitioners and the learning of new technologies. It also makes the cost of techniques transfer between different groups reduce. For the teaching of Tai Chi, the introduction of VR techniques can improve the teaching environment, stimulate students' interest in learning, increase learning efficiency, and most importantly, not limited by the conditions of the venue. Teachers can quickly create a variety of teaching materials such as corresponding teaching scenes, external environment, and various characters in virtual teaching, and present the key and difficult actions and the environment to the students, which is more conducive to the students' correct understanding and mastery.

When VR techniques is introduced into mass physical exercise (provided that the cost of VR equipment has been reduced to a widely acceptable level), it can open up new exercise modes and sports experiences, which are not limited by region and venue, which is equivalent to Combining the popularity of online games with the personalized experience of physical exercise, the experience of the game is richer and more stereoscopic, and the activities of exercise arouse people's interest.

But we should pay more attention to the application of VR techniques in the Tai Chi project, although it can promote its development, improve training level and even replace some training or rehabilitation methods, but in the final analysis it is an auxiliary means, not that we use this techniques The purpose of VR is just like the confusion of human society in the face of the high-speed popularization of the Internet. VR techniques will also create a more immersive illusion for the user
community, so how to use this “two-edged knife” is Think ahead.

Visual information ingestion is a basic element of sports involving interception tasks. Currently, there are several methods, such as videos and methods based on virtual environments, to analyze the visual perception under motion. Both technologies have advantages and disadvantages. The study attempts to determine which technique is preferred in the analysis of visual information in sports situations. For this purpose, Nicolas Vignais used two standardized methods to compare the performance of handball goalkeepers: video clips and virtual environments. The performance of these two response tasks was checked: an undecided task (the goalkeeper shows where the ball ends) and a coupled task (the goalkeeper tried to intercept the virtual ball). The variables studied in this study include the percentage of correct area, percentage of correct response, radial error and response time. The results show that when facing a virtual handball pitcher, the handball goalkeeper is more effective, more accurate, and starts intercepting earlier than when facing a video clip. The results show that based on the “VR” method, the visual information intake of the opponent's goalkeeper can be better analyzed.

For the popularization of Tai Chi animation, different Tai Chi data can be processed as follows:

1) Boolean type

\[
\mu A(S_{ij}) = N(\alpha jk)/n, k = 1, 2, \ldots, n
\]

Where \( n \) represents the data number.

2) Value type

Assuming that \( I \) represents the number of classes of attributes, \( C_i \) represents the first class, \( N(CI) \) represents the number of attributes in \( C_i \), \( C_j \) represents the \( i \)-th attribute value in class \( l \), and the membership function of the attribute value represents shown in equation (2)

\[
\mu_i(C_l^{(i)}) = N(C_l)/n, l = 1, 2, 3, \ldots, i = 1, 2, 3, \ldots
\]

4. Design of Tai Chi promotion system

The Tai Chi promotion system based on animation techniques refers to a computer system that uses animation techniques and post-synthesis techniques to simulate and display various moves of Tai Chi. This method is a new way to promote the influence of Tai Chi at present. Different groups of people use different animated image designs to attract more groups to participate in the learning and promotion of Tai Chi. The design process of the system is shown in Figure 1.
4.1. Data collection, consolidation and analysis
In the process of inheritance and development, Tai Chi often takes the form of routine practice. Its routines are complicated and difficult, which is not easy to be learned and mastered by beginners, and it is easy to cause the practitioner to pay too much attention to the surface form of the movement, but not to Comprehending the core and essence of Tai Chi makes the beginners feel dull and dull, and loses their interest and enthusiasm for continuing to learn, which seriously affects the promotion and development of Taiji culture. The psychological characteristics and acceptance ability of beginners follow the principle of gradual and progressive, bringing together representative movements in Tai Chi, and on the basis of combining Tai Chi's techniques, eye methods, body methods, and footwork, made certain innovations and breakthroughs. Follow the natural movement characteristics of Tai Chi breathing, pay attention to the left and right symmetry of the movement, and the difficulty is moderate, so that the learner is easy to remember and practice.

4.2. Character modeling and scene design
The development of animation techniques has gone through the process from traditional frame-by-frame production to computer two-dimensional animation, and then to the current three-dimensional animation. In two-dimensional animation, the motion of the object cannot completely match the real motion law. The displayed courage has a different feeling from 3D animation, it can give people full imagination space and exaggerated space. In 3D animation, creators can use the camera in the virtual world as an ideal camera, so that in 3D space You can use any shooting angle here, at the same time, you can make the changes and movements of objects not subject to objective laws, and you can also express the realistic texture of objects through different materials and lighting effects. Therefore, you are doing Tai Chi character modeling and scenes. When designing, we use a combination of two-dimensional animation techniques and three-dimensional animation techniques, the two complement each other, each has its own strengths, so that the system presents the beauty of fusion. At the same time, for different groups, we use different styles of characters Image and scene design, so as to meet the needs of a variety of age levels as far as possible. As shown in Figure 2, a variety of character image design, Figure 3 for the scene design meter.

Figure 1. Design process of Tai Chi system
4.3. Action sub-lens and music production
Tai Chi pays attention to softness, roundness, stretch, centering, dynamic and static, rigidity and softness, moving clouds and continuous flow. Hence, when we make action shots production, the production staff must first learn the individual moves of Tai Chi, and Comprehend the artistic conception and draw the guidance of professional Tai Chi teachers when drawing the sub-camera script, and strive to reflect the action essentials followed by Tai Chi, namely guided by mind, led by qi, discontinued in movement yet continued in mind, stopped in the body yet continued in qi.

In the selection of background music, the artistic conception of the music should be consistent with the style of the routine, and the rhythm should not be strong. To attract fashionable young and middle-aged groups, we used modern music as the background music, and for the middle-aged and elderly groups, it can reflect the national culture. Traditional music as background music.

4.4. Original animation design and production
As a highly comprehensive art form, animation not only shares the language form of the film, but also has the art language of fine art, has a strong artistic expression and vitality. Hence, in the design of the original picture, we need to consult massive materials, analyze Tai Chi art, such as character clothing design, hair design, etc., so that the character image should not only reflect Tai Chi culture, but also meet the principles of anime image design. In the Tai Chi movement design, it should not only reflect the laws of movement, but also follow the speed, rigidity, opening and closing, and straightness of Tai Chi routine, and the characteristics of the movement are all in one go, exerting the expressive power of animation art. In the design of original picture, mainly the image processing software such as Photoshop and Sai is used, and the materials are then imported into Flash Hook online to make animation.

4.5. Post-synthesis and output
In the later stage, Adobe Premiere is used for synthesis. We import the pre-made animation clips, background and background music into Premiere, complete the synthesis of the entire effect by adding clips and special effects, and use Premiere's subtitle function and recording function to add the action title and action essentials for each style of Tai Chi. To ensure the clarity of the picture and meet the requirements of various media communication at the same time, in the output, we adopt different output settings for different media, such as for network communication media, We output in FLV.
format to facilitate network transmission; for those who like to use mobile phones, we can output to MP4 format to meet user demand.

4.6. Software instructions

4.6.1. Use of software. The development of this software is to effectively promote Tai Chi, expand the influence of Tai Chi culture, and provide a platform for Tai Chi lovers to communicate.

4.6.2. Software working environment. This software runs on a PC and its compatible machines, and uses the Windows operating system, which requires the Flash player to be installed in the system. After the software is installed, click the corresponding icon directly to display the main menu of the Tai Chi promotion system and perform the corresponding operating.

4.6.3. Software function. The software includes 4 modules, namely Tai Chi Introduction, Chen Style Tai Chi, Taiji Culture and Tai Chi Homepage. The first module Tai Chi Introduction mainly introduces the development history of Tai Chi and the main features of Chen Style Tai Chi. The second module, Chen-style Tai Chi, uses animations to show the various styles of Chen-style Tai Chi. It is convenient for Tai Chi enthusiasts to learn Chen-style Tai Chi by themselves; the third module Taiji culture mainly introduces some articles related to Taiji. For example, Wenxian Chenjiagou introduction, Chen style family introduction, Taiji health, Taiji related products and other articles; the fourth module Tai Chi homepage mainly uses the Internet to conduct overall promotion of Tai Chi culture, including Taiji related news, Taiji forum, Tai Chi videos, various Tai Chi introductions, etc.

5. Conclusion

In the society where the Internet is increasingly prevalent, the material transmission channels are also constantly changing. Tai Chi promotion system based on animation techniques was born in this context. Through animation transmission channels, can not only the Chinese national culture be promoted quickly and effectively, but it can also boost the development of Tai Chi industry.

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