2021 2nd International Conference on Information Science and Education (ICISE-IE) | 978-1-6654-3829-2/21/$31.00 ©2021 IEEE | DOI: 10.1109/ICISE-IE53922.2021.00369

Artificial intelligence application of virtual reality technology in digital media art creation

Xiaoyan Wang, Yi Sun
Shandong Xiehe University, Jinan, Shandong, China
2008xiehe@dlvtc.edu.cn

***Abstract*—The artistic creation of digital media in the new era needs to further expand its information capacity and realize diversified functions on the basis of traditional forms of expression such as graphics, audio and video, so higher requirements for technical means are put forward. With the development of artificial intelligence technology in China, virtual reality technology plays an increasingly important role in digital media art creation. Virtual reality technology in artificial intelligence has the characteristics of immersion, interaction and imagination, which can provide more abundant technical means for digital media art creation. This paper will analyze the virtual reality technology methods and technology application paths that are commonly used in digital media art creation at present.**

Keywords-Digital media; Artistic creation; Virtual reality technology; Artificial intelligence applications

I. Introduction

Application of virtual reality in the digital media art is artificial intelligence technologies such as digital media art major technological innovation, it not only make the digital media presents more diversified in form, but also can provide people with immersive experience, enhance interactive digital media art works, for the development of digital media creation ideas, Improving the level of digital media art creation plays an important role. So digital media art researchers should strengthen the study of artificial intelligence technology such as virtual reality, fully understand the characteristics of the virtual reality technology, the combination of different digital media art forms and the actual situation of the artistic creation and reasonable choice of virtual reality technology, to create the diversity of new digital media work, improve the artistic appeal of the works. At the same time, relevant technical personnel should also actively research and develop digital media art creation tools based on virtual reality technology, provide convenience for digital media art creation, and promote the application and promotion of virtual reality and other artificial intelligence technology in digital media creation.

II. Overview of virtual reality technology in digital media art creation

The so-called virtual reality technology is to simulate the natural and real environment through the integration of multimedia technology, computing technology and artificial intelligence technology such as simulation simulation, so that the audience can get close to the real multi-sensory experience. Artificial intelligence virtual reality technology is characterized by immersion, imagination and interaction [1]. Through the application of artificial intelligence virtual reality technology in digital media art creation, people can get immersive experience. Creators can carry out artistic innovation in the state of integrating into virtual space, and the created digital media art works can also make the audience get more shocking and real experience feelings. At the same time, artificial intelligence virtual reality technology can also provide technical support for creators to give full play to their imagination and creativity in the virtual environment, and break through the space-time constraints of traditional digital media artistic creation. In addition, the application of artificial intelligence virtual reality technology can also realize the communication and interaction between digital media art works and experiencers, making the works more artistic appeal and easier to arouse the resonance of the audience, so that the audience can fully understand the artistic conception of the creator. Therefore, artificial intelligence technology such as virtual reality technology has obvious advantages in the application of technology in digital media art creation, which is a major technological innovation in the field of digital media art creation.

III. Analysis of artificial intelligence virtual reality technology commonly used in digital media art creation

A. Tilt Brush virtual reality technology application analysis in digital media art creation

With the development of artificial intelligence virtual technology, the Tilt Brush technology integrating digital painting has gradually become a popular VR technology in digital media art creation. Tilt Brush is a virtual-reality-based artificial intelligence drawing technology that can be used to create different types and styles of paintings. Tilt Brush features a wide range of elements, including apertures, strokes and environment elements. Tilt Brush VR technology is mainly implemented by HTC and other VR devices [3]. Creators only need to control the handle to create and edit digital media works of art. In practical application, the creator needs to wear a special display device, and then according to personal creation habits, hold the handle to complete the control of the tool panel and painting creation. In the process of creation, creators can paint and create at will in the virtual space and get real experience. For example, after the creator completes the description of the house in the virtual space, he can directly enter the interior of the house to continue to decorate the creation, such as adding furniture or painting the wall. The creator can also beautify the external environment of the house according to the creation needs, such as depicting flowers and trees, so that the creator can get a very real feeling in the creation process. Tilt Brush VR can also provide virtual environments in snow, at night, or under the stars for digital media art. In addition, the head-mounted virtual display worn by the creator also has the functions of tracking and motion capture, which can easily adjust the Angle and capture human movements with infrared tracking equipment, so as to create

978-1-6654-3829-2/21/$31.00 ©2021 IEEE
DOI 10.1109/ICISE-IE53922.2021.00369

paintings in an active tracking way. Advances in Tilt Brush VR technology and virtual devices have led to the addition of new controllers that can interact with audio sources, making Tilt Brush VR a better fit for digital media art. Creators only need to switch brush tools and adjust controller parameters to complete artistic creation. The creation of digital media works of art is more convenient and conducive to the full play of creators' imagination and creativity. After creating a piece of digital media art, Tilt Brush's virtual reality screenshots can be used to save the artwork and create a three-dimensional image.

B. Application analysis of Oculus Quill VR virtual reality technology in digital media art creation

Similar to Tilt Brush VR are artificial intelligence technologies such as Oculus Quill VR, which are increasingly being used in digital media art creation. Oculus Quill VR is also a technical method that uses virtual space to provide technical support for creators to create paintings, mainly through the comprehensive application of virtual devices such as motion cameras and painting handles. The main function of the motion camera is to capture and record motion, and the handle is a painting tool. In the virtual space, creators can virtually manipulate various paintings or click on a palette to create digital media art works. At present, Oculus Quill VR virtual reality technology is not widely used in digital media art creation due to its technical maturity and application experience. However, Oculus Quill VR has a broad application prospect in digital media art creation due to its technological advantages in originality and artistic presentation.

C. Application analysis of Oculus Medium VR virtual reality technology in digital media art creation

The so-called Oculus Medium VR technology is based on virtual reality technology for artistic design and creation of digital media technology. Not only does Tilt Brush and Oculus Quill VR have the ability to freely manipulate color palettes and other painting tools, but it can also provide materials and virtual scenes for digital media art creation. It can also present digital media art works in the form of three-dimensional sculpture. This is mainly because Oculus Medium VR virtual reality technology can provide creation materials with textures such as clay, so it has obvious technical advantages in digital three-dimensional sculpture creation.

D. Application analysis of Holo Studio virtual reality technology in digital media art creation

Holo Studio virtual reality technology is also an artificial intelligence technology widely used in digital media art creation. Holo Studio's virtual reality technology provides a virtual space for artistic creation in digital media, which can be controlled by a controller and a head-mounted virtual device. For example, during creation, the creator can adjust the floating window window by moving his eyes and making gestures, and construct the hologram. The creator can freely adjust the height, width and size of the object, as well as choose different materials and colors. Creators can not only observe their works from various angles and in an all-round way, but also understand the mutual relationship between various creative elements. You can also run and jump in the virtual space to get a more real experience. In addition, creators can also obtain the parameters of the area where their eyes are through VR glasses and other virtual devices, which provides convenience for refining the details of digital media art works.

E. Analysis on the application of Quick VR technology in digital media art creation

Quick VR virtual reality technology is widely used in digital media art creation at present. The so-called Quick VR virtual reality technology is the construction of computing platform through computer technology, and the virtual scene three-dimensional, dynamic all-round presentation of the technical means. Quick VR virtual reality technology can build three-dimensional 3D virtual scene, and can make the experiencer in the virtual space to get a more real experience. When using Quick VR virtual reality technology to create digital media art works, creators can connect cameras and digital cameras and other electronic devices on electronic devices according to the creation needs, and then import photos and other data information into VR plug-ins. Afterwards, the powerful editing function of Quick VR technology should be utilized to conveniently complete the editing and creation of plane images and audio and video files [2]. The application of Quick VR virtual reality technology can be very convenient to the image and audio files for cutting or color, and can be converted to the plane image in a three-dimensional way; At the same time, the technology can also connect images, and adjust the playback progress and content, through human-computer interaction to complete the creation of digital media art works. Quick VR virtual reality technology reduces the threshold of digital media art creation, so that ordinary people can also carry out digital media art creation. Creators only need to invest their imagination in Quick VR technology to achieve the creation and editing of materials. Quick VR virtual reality technology has been increasingly widely used in the construction of virtual scene art works in public space, commercial outlets and related educational activities. Its digital media art works can enable experiencers to obtain multi-sensory immersive experience, and can realize the interaction between scenes. Greatly improved the digital media works of artistic expression and appeal.

IV. Analysis of digital media art creation system based on artificial intelligence virtual reality technology

A. Hardware structure analysis of digital media art creation system based on artificial intelligence virtual reality technology

To apply virtual reality technology in digital media art, to express characteristics of digital media art through artificial intelligence technology, the digital media art in the creative process can realize the visual expression and must match the key information point, you need to actively research and development based on virtual reality technology of artificial intelligence of digital media art system, Multi-sensor interaction and 3D image generation can be realized through reasonable configuration of hardware and software technology equipment, thus laying a good foundation for the application and promotion of artificial intelligence technology such as virtual reality technology in digital media art creation [4]. Among them, in the digital media art creation system based on artificial intelligence virtual reality technology, the data processing order should be reconstructed and optimized according to the characteristics of 3D images, and the data storage device, core processing device and bus interface of the

system should be reasonably selected. Taking TMS320C6657 core processor as an example, the basic hardware framework structure of the system can be seen in Figure 1.

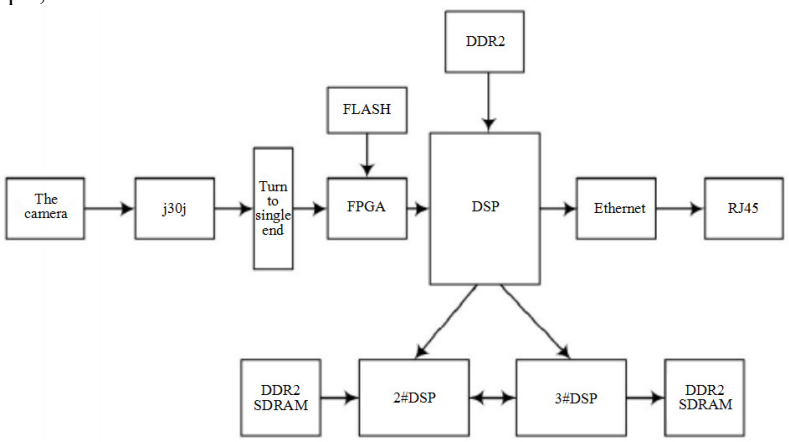

Figure 1 Hardware structure diagram of digital media art creation system based on artificial intelligence virtual reality technology

In order to meet the requirements of digital media artistic creation and improve the processing capacity of the hardware system, DDR3-1333 and DDRS control devices can be used in the system, and the original input and output interface should be optimized and improved to reduce the power consumption of the system and circuit noise, and improve the system operating environment. For virtual reality technology in digital media artistic creation in the actual application to create a good prerequisite.

B. Software function analysis of digital media art creation system based on artificial intelligence virtual reality technology

Application of virtual reality in the digital media art need to rely on artificial intelligence technologies such as the realization of the system has the function of each module, and based on virtual reality technology of artificial intelligence in the digital media art creation software system, the image module function can be done by the OpenCV library function control image import, processing, conversion and other functions. The main function of image import control is to use ImageLoader to import images. The image processing control has a processing callback function and a unified output template. Data and other functions. Meanwhile, CVThresholdType in the image change control can also be used to select different image data algorithms according to data characteristics to complete image transformation [5]. The basic function of the video module in the digital media art creation software system based on artificial intelligence virtual reality technology is to transform and process the video display image in the form of virtual 3D image. The data processing process can be seen in Figure 2. In the video processing module, the video file and the data obtained by the camera can be processed and analyzed uniformly, and the image information can be retrieved by the virtual display technology. After that, the CvCaputure object can be created by calling the information of the video source. In this process, reading frame information in video file and camera data is the key step of processing. When this is done, the CvQueryFreame function should be called looping to get all the frame data in the CvCaputure object. The loop ends when the data is retrieved. In addition, the camera function should be reset after the above processing, than the outline to ensure that the virtual display of search results is accurate.

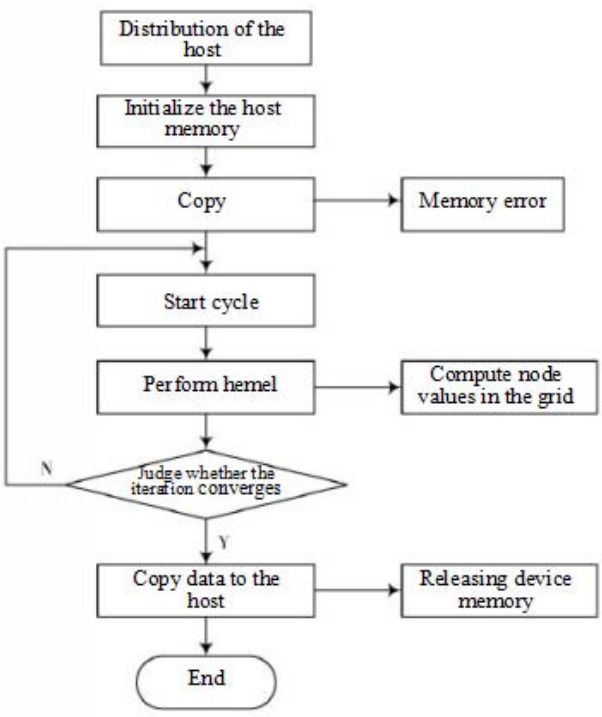

Figure 2 Schematic diagram of video processing flow of digital media art creation software system based on artificial intelligence virtual reality technology

BASS can be used for data sampling in the sound module of digital media art creation software system based on artificial intelligence virtual reality technology. The BassLoader control can be used to import sound data, and complete the extraction of audio data and the display of naturalized floating point number. At the same time, the WebcamProvider control can be used to extract the camera frame data, while the CvContourExtractor and Smooth control can be selected to extract the image contour.

In the application of virtual reality technology in digital media art creation, the input object is the foundation of creation, so users should be scientific preset parameters, and according to the need to configure the audio video and image capture devices, combined with the mouse, keyboard, operating handle and head-mounted device integrated application of the basic equipment of digital media provide technical equipment foundation of art creation. Only reasonable use of hardware equipment and software system in digital media art creation can better application of virtual reality technology.

V. Conclusion

With the continuous development and maturity of artificial intelligence technology, emerging digital media technology represented by virtual reality technology has been more and more widely used in the creation of digital media art works. In order to create multiple types of digital media art works, reflect diversified art styles and present richer forms of artistic expression, the realization of more creative artistic imagination provides important technical support. Therefore, digital media art creators should actively learn and master virtual reality technology, break through the shackles of traditional creation methods, make reasonable use of virtual reality technology means, and create digital media art works with more artistic appeal and unique style. Technical personnel should also strengthen the research and development of digital media art creation system based on virtual reality and other artificial intelligence technology, so that creators can more conveniently engage in the creation of digital media art works, so as to lay a good foundation for the application of virtual reality technology and other artificial intelligence in digital media creation.

References

[1] Zhang Jie.(2021) Research on the combination of digital media technology and virtual reality technology [J]. Tomorrow Fashion, (19): 176-178.

[2] Wang Wen.(2021) On the artificial intelligence application of virtual reality technology in digital media art creation [J]. Tomorrow Fashion, (16): 185-187.

[3] Linghu Kegeng.(2021) On the application of virtual reality technology in digital media art creation [J]. Tomorrow Fashion, (13): 178-180.

[4] Gao Lei.(2021) Analysis on the combination of digital media technology and virtual reality technology [J]. Science and Technology and Innovation, (9): 180-181.

[5] Wu Shangru.(2020) Artificial intelligence application of virtual reality technology in digital media art creation [J]. Information Recording Materials,21 (1): 106-107.