Application of Computer Visual Art in Digital Media Art

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Abstract—This article analyzes the basic content, element meaning, application characteristics, application advantages and other contents of computer vision art. The author studies the key points of application of computer vision art in image information processing, animation information processing, film and television information processing, and game screen processing. This paper studies the trends of cultural connotation transmission, emotional development, and intelligent development. The author's purpose is to give full play to the application value of computer vision technology and accelerate the development of digital media art.

1. INTRODUCTION
In the context of the digital age, the richness of information products such as digital TV, digital movies, and digital maps is also increasing, bringing more convenience to people's lives. Computer vision technology is a branch derived from computer technology. It has very good applications in film and television animation production, online game production, and image processing. Sorting out the specific application of this technology in digital media art not only can optimized the content of art design, but also has a positive significance for accelerating the development of the industry.

2. ANALYSIS OF COMPUTER VISION ART RELATED CONTENT
2.1. Basic Content
Computer vision is also known as an optical recognition system that mimics human beings. It needs to rely on the computer control system of the light source sensor to locate and judge the object and the research has been more than 30 years. Moreover, this technology is mostly used in engineering. Although it is different from the human visual system, it can work completely accurately by computer under certain environment and mode background. This can accomplish tasks that humans cannot do and replace humans with tasks that require a lot of work. Computer vision originated in the 1960s and has been used abstract things to describe the essential structure of objects. With the development of computer vision, people have been studying images, text, and audio, and computer vision art has also been understood by people. The changes in its form have also received widespread public attention. In order to enrich games and movies, people gradually began to use some words, sounds, and images. Now this factor has become a part of people's daily life.

2.2. Element Meaning
Visual communication is the process of taking a certain purpose as the forerunner, using visual art methods to convey specific information to specific objects, and at the same time affect the process of being transmitted. The elements of visual communication are mainly reflected in colors, graphics and
text. Among them, text is not only a way of drawing human emotions, but also a symbol for recording information. It has a specific meaning in form, and it is obtained according to certain constitution rules. In traditional text, there are usually serifs, and the font contrast is not great. Modern fonts are more concise and clear. After the serifs are removed, the lines are no longer divided into thickness. From now on, digital text will be more free and flexible, making all text possible. According to the meaning of visual transmission, it is not difficult to realize that any text has a graphic meaning. The text design should not only be embodied in the shape, but also should be done with artistic treatment from the text content. Only in this way can it show a unique emotional temperament and artistic content. The text design includes glyphs, font structure and text layout. Designers can use this to improve the coordination and balance of the structure.

2.3. Application Characteristics

2.3.1. Virtuality
Judging from the current application situation, when designing computer vision art, it has good virtuality. At present, in the process of technology application, more than 70% of the content is processed through digital information imitating. It can be combined with some modification techniques to achieve the corresponding use effect. Such information content does not belong to independent application information in use, but is calculated with the aid of computer technology. But from the point of view of actual application, the user will make 100% copy of the reference object. Subsequently, users will perform virtual processing on the basis of physical objects to enhance the artistic value of physical content.

2.3.2. Temporal and Spatial
In practical applications, computer vision art is usually used as a kind of image processing method with a higher degree of freedom, and it also maintains a good relationship with life in applications, and it will not be constrained by temporal and spatial content. Moreover, its specific form is not limited, and it can use imagination to create a virtual world. For example, some ancient beasts such as "gluttonous", "qilin", "kun" and "Qingqi" recorded in "Shanhaijing" are all legendary species. Whether they ever existed is still unknown. The computer art can be used to organize it, and with imagination, it can draw concrete content. As shown in Figure 1, the two pictures on the left and right belong to people's imagined unicorn appearance, which has strong dynamics.

![Schematic Diagram of Unicorn](image)

2.3.3. Versatility
Except to the application content mentioned above, there are also general features in the application of computer art. There are also strong differences in cultural content involved under different national cultural backgrounds. But there are many interoperability in the form of computer art expression. For example, there are currently more than 200 countries and hundreds of languages in the world, but in computer art processing, the processing of art is universal. Moreover, the degree of freedom in the artistic process is higher. It will not be affected by the external environment and can achieve the intended purpose more conveniently.
2.4. Application Advantage

2.4.1. Rich Visual Appeal
From the perspective of the development of computer art, technology integrates more image elements, text elements, sound elements, etc. in the application. This also increases the technological richness by 60%-80% on the original basis, which also brings better visual effects. Moreover, numerical media content can be further enriched in the application process of computer vision art. Compared with previous visual expressions, its visual appeal has also increased by more than 30%. For example, many museums will use three-dimensional virtual images to restore some damaged cultural relics. In this process, the staff will also use 4D technology to increase the authenticity of virtual images, so that users can better perceive cultural relics and improve the reliability of visual management content.

2.4.2. Rich Visual Expression
With the continuous optimization of various application technologies, the visual images currently viewed by people are no longer a certain type of visual symbol, but an application mode that facilitates information interaction. Its richness and effectiveness have been greatly improved. For example, people make full use of the sense of interaction in some VR games. Moreover, digital media will be used to complete the interface design in the application. Subsequently, the designer will use various programs in the mobile client to complete the information connection. In the application, designers can also smoothly interact with digital media to increase user participation.

2.4.3. Extend the Scope of Application
Except to the application functions mentioned above, digital media technology will be fully integrated with current popular elements in practical applications. This has also broadened the application range of digital media to a large extent. For example, the currently applied smart phones have good somatosensory functions in the application, and people can complete information operations and other content by sliding the screen. Moreover, people also use induction for some mobile games to complete operations such as movement and hitting in the game screen. In this process, the interactivity between the media can also be improved. In addition, with sound and optical elements, better application effects can be obtained. For example, the use of VR glasses to simulate real life, with the help of its good visual effects to expand the scope of application of numerical media.

3. THE SPECIFIC APPLICATION OF COMPUTER VISUAL ART IN DIGITAL MEDIA ART

3.1. Image Information Processing
Judging from the current use situation, computer vision art has a good use in image information processing. Compared with graphic content, the richness of image information is stronger, and more than 70% of the images are image information processed in real scene. In order to facilitate its storage, people have performed digital processing on it, which is also conducive to the orderly progress of storage activities. In the process of image information sorting, it is mainly composed of multiple pixels. Different types of image information can be obtained by using different colors and different permutations and combinations. In the field of digital media, different composition methods and graphic methods are used to adjust application things to obtain special artistic expressions [1]. As shown in Figure 2, using different colors to design image information can get more intuitive teaching building information. This also helps people better understand structural information. Meanwhile, in the design process, the designer will also analyze the required details through methods such as panoramic design, mid-range design, and long-range design. Designers can use this to complete the smooth expression of the scene, thereby improving the reliability of the application content.
The computer also uses different colors in the composition process to complete image information sorting. The currently used processing colors include red, orange, yellow, green, cyan, blue, purple and other colors. The emotional characteristics given by different colors are also quite different. For example, red represents warmth and enthusiasm, while green represents youthful vitality. This also brings greater influence to the optimization of emotional tone. Based on this, in the specific application design, the information content can also be emotionally expressed and artistically processed. In practical applications, designers can also deal with information that cannot be expressed in words or audio, such as dreams and wishes. This information can also be represented by reliable image information in the process of being used, so as to obtain the required application data and more intuitive image data [2].

3.2. Animation Information Collation
Computer vision art also has a good application in the organization of animation information, which can optimize 30%-40% of the content on the original basis. Animation in use is to arrange each frame of pictures in chronological order to obtain the required picture information. In practical applications, the principle of "persistence of vision" is used, which optimizes the content of animation images to obtain the required animation information. Based on past application experience, every second animation is composed of 25 frames of animation, and the production process is relatively complicated. Moreover, the use of computer vision art in applications can also be used to visualize some imaginary content, and we can use this to enrich people's spiritual needs. As shown in Figure 3, the cartoon "Kung Fu Panda" uses vivid plots to show the characters' personalities. While people understand the Kung Fu Panda's simple and honest character, they also convey positive energy to people. There are many similar cartoons, such as "Havoc in Heaven", "Astro Boy with Iron Arms", "Three Thousand Questions about the Naughty Blue Cat" and so on. The images established in these cartoons have no reference in life. However, people can still show the character image they need to express, which enhances the artistic value of the content [3].

3.3. Film and Television Information Processing
From the perspective of practical application, computer vision art is also well used in film and television information. From the perspective of practical applications, montage methods are generally
used for processing to show the desired picture. This is also the processing method currently used in more than 80% of film and television works. Moreover, in the application process of this technology, computer vision art has a very good application. For example, computer visual art is used in the "Star Wars" series of works to create a very rich simulation of war scenes. In "City of a Thousand Stars", "Avatar", "Transformers" and other movies, many virtual characters have been produced using computer visual art, which has given full play to the application value of technology. Take "Transformers" as an example. In specific applications, from the Transformers battleship to the small screws that fall off the Transformers during a fight, all of them are optimized using this technology. Moreover, this also creates a very real virtual world and brings people a very rich visual experience. It can be seen that computer simulation technology can also be used to enhance the visualization and visualization of content in the application process of computer vision art. In this way, some virtual information can be displayed and processed more smoothly, thereby bringing people a 30% sense of hierarchy and meeting application requirements [4].

3.4. Game Screen Processing

3.4.1. Large-scale Video Games
From the perspective of application, computer vision art also has a very important application in large-scale video games. For example, the current relatively hot "League of Legends" has been loved by the majority of players, and players use the keyboard and mouse to direct the movement of the characters. People can use the keyboard keys to complete the skill release to enrich the user's service experience. At the same time, in the context of the accelerating development of virtual reality technology, many VR games have also been loved by users. Players can use the handle to complete the specified action to kill the target in the virtual scene. The VR glasses worn can also further enhance the virtuality of the scene, thereby bringing a richer sense of presence to meet the requirements of visual experience [5].

3.4.2. Small Video Game
At present, in application, computer vision art also has a very good application in small video camera games. For example, the game Wii Remote as a flagship game uses a standard controller for control in specific applications. This also exceeds other control models by more than 50%. The game has good action abilities in practical applications, and players can also use some directional actions to complete the game in the application, and connect to other auxiliary systems to optimize the operation of the device. Otherwise, sensors can also be used in information applications to further optimize system operation functions, thereby improving the reliability of image information, and then obtaining a more complete system application structure [6].

4. THE FUTURE DEVELOPMENT TREND OF COMPUTER VISION ART

4.1. Cultural Connotation
People also need to do a good job in the transfer of cultural connotation in the future development of computer vision art, so as to enrich the application content of numerical media. In the context of the information age, digital media has developed very well. The media has not only been well developed in the digital field, but also has good applications in the field of painting. This also means that digital media has also begun to develop in the direction of popularization. But many people ignore the work of cultural connotation transmission, which also reduces the timeliness and impact of the proposed content. Therefore, in the future development, people need to strengthen the cultural transmission processing and enhance the impact of the processing results. For example, Chinese culture is fully integrated into the design of the Beijing Olympic mascot. The five Fuwas also represent different cultural contents, combined with smart animation production, which also effectively enhances the delivery effect of the production content [7].
4.2. Emotional Development

In the future, the development of computer vision art will also develop along the emotional direction. This is also an important way to enhance the resonance of personnel. In the actual development process, emotionalization has always been an important carrier for maintaining content in the development process. In the development of digital media art, emotional content can be refined, and reasonable artistic expressions can be used to complete the emotional expression of content. For example, in "Kung Fu Panda 3", the main line of emotion is family affection and mentorship. As a result, when using computer vision technology to process it, it not only integrates the elements of Chinese shadow puppetry, but also creates an emotional atmosphere for users in a more soothing environment. Together with the corresponding sound effects, the emotional content is greatly enriched, and the emotional resonance of the audience is improved [8].

4.3. Intelligent Development

In the future, the development of computer vision art will also develop in the direction of intelligence, which is also an important way to improve the rationality and convenience of the production process. In the actual development process, intelligence has always been the goal of continuous improvement and optimization in the development process. In the development of digital media art, computers can not only refine the processing of intelligent content, but also better optimize the design details, and improve the flexibility and fidelity of the production process. For example, in "World of Warcraft" there are a lot of content combined with real scenes. When using computer vision technology to process it, not only to refine the details, but also to dynamically adjust the content. This improves the orderliness of the intelligent development process.

5. Conclusion

In summary, computer vision art is a change in the way of creation, and even a change in lifestyle. Computer vision art also incorporates more aesthetic pursuits and humanistic care, so that digital media can display more adequate social and humanistic values while exerting artistic value.

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