

Application of computer digital media technology in animation production

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Abstract: The emergency of computer, developed to 1960s, has impacted various fields deeply, promoting reforms in every single aspect. With the help of computer technology, those reforms have been developing over time, which could be a telling evidence that computer technology has a positive bearing on the whole society. Among computer science, digital media technology has contributed to the enhancement of animation industry. As economy and digital technology has been developing by leaps and bounds, digital media technology, an information carrier based on modern science and technology, has swept over entire world, particularly in the film and television industry. This paper will discuss the impact of digital media technology on the animation industry and specific application in animation production, so as to clarify the role of digital media technology and to improve the efficiency of animation production, taking an insight into the effect that computer digital media technology brought to animation production in order to figure out past and look forward to future.

1. Introduction

Digital media technology is a new form of artistic expression based on modern science and technology. It refers to the information carrier that records, processes, disseminates and obtains the process in the form of binary digits. The application of digital media technology can enable animation to be more vivid and enhance the graphic quality, which has a profound impact on the animation industry.

2. The impact of digital media technology on the animation industry

The rapid development of our country's digital technology and spiritual culture has added fuel to the animation industry, which is becoming a burgeoning way for entertainment. Among them, digital media technology provides high-quality creative space and possibility for the design and production of the entire animation industry. In the context of the accelerated development of the globalization of China's animation industry and the era of digital media, digital media technology has a particularly deep impact on the animation industry. Digital media technology combines science and technology with art, breaking through the production methods and design ideas of earlier animation. From the initial design to production, it has had a significant influence on the entire animation industry.

As people's demand for cultural and spiritual fulfillment continues to rise, so does the demand for film and television industry. Due to the significant advantages of digital media technology, it has gradually become the mainstream technology for animation creation, whose influence on the animation industry is primarily seen in several key areas ^[1].

2.1 Improve the efficiency of animation production

Unlike previous forms of animation creation, the integration of digital media technology into animation creation can significantly shorten the animation creation cycle. First of all, traditional animation production is largely constrained by paper and painting tools, such as visual effects and a large number of manual repetitive work, however promoting the diversification and personalized development of the animation industry. Compared with traditional animation production methods, the high-quality environment provided by digital media technology enables creators to explore more techniques for expression and visual effects while avoiding redundant work, which accelerates the animation production process and reduces both time and labor costs.

Compared to the duration of the past, a 20-minute episode of animation would require a team approximately two months to produce. In the advent of digital media technology, this production time can be reduced to 2-3 weeks, or even less; at the same time, the quality of animation works has been greatly enhanced.

2.2 Expands the efficiency of propagation of animation

Digital media technology breaks through the limitation of traditional animation transmission through radio and television, allowing animation to spread more widely and rapidly under the transmission channels of digital new media. Thanks to the sharing, coordination and adaptability of digital media technology, it can be quickly promoted and disseminated to public through the Internet and media via the information service industry, opening a new era of animation.

At the same time, the advancement of digital media technology has greatly enhanced the interactivity of animation. By hosting animation on different Internet platforms, creators can communicate and interact with audiences directly through the platforms, obtain market feedback more efficiently, and reduce information asymmetry in online communication. Furthermore, the diverse internet communication channels in the digital media era allow animation creators to build their own fan communities, monetize the traffic generated by animation through selling merchandise or offering rewards, and thereby foster the creation and growth of the animation industry ^[2].

2.3 Embrace the potential of digital media technology to transcend the limitations of traditional animation design and production.

Historically, the creation of hand-drawn animations was hindered by numerous factors such as resources, spatial constraints, and time pressures, which prevented animators from fully realizing their visual and emotional concepts. The advent of digital media technology has opened up a vast array of possibilities for animation design and production. For instance, traditional hand-drawn animation require the simultaneous creation of characters and scenes, resulting in a lack of detail in some sequences or actions during the production process. Furthermore, this approach restricted the audience's perspective, making the animated characters rigid and unable to fully convey the animator's intended message or engage the audience. However, digital media technology has transcended these limitations. For example, animators can now disassociate scenes from characters and shoot from multiple perspectives using scene modeling, allowing them to more effectively express emotions through cinematic language. Additionally, they can meticulously render details of

materials, light and shadow from both macro and micro perspectives before integrating the characters with the scene, opening up a wealth of possibilities for animation creation.

Moreover, digital media technology enables the integration of animation with reality. By drawing inspiration from real-life elements and simplifying or rendering them using digital media technology, the design and creation of animation become more convenient and authentic. This approach also allows for the comprehensive integration of lifestyle details into animations, enriching the content and immersing the audience in the narrative.

Digital media technology has revolutionized the traditional linear creation structure of animation, enabling the process to transcend the limitations of time. By harnessing the power of digital media technology, animation creation has become systematic, with different aspects of the same scene assigned to specialized personnel. Ultimately, these elements are integrated through computer editing, resulting in a rational allocation of resources, time savings, and professional production in animation creation.

Furthermore, digital media technology has paved the way for the development of interactive animations and virtual reality experiences. Due to technological advancements, audiences can transition from being mere spectators to active participants, engaging with other game characters and enhancing their sense of immersion in the viewing process^[3].

3. Specific application of digital media technology in the animation industry

In recent years, alongside the vigorous development of digital media technology, the works produced by the animation industry have achieved a qualitative leap. Next, this paper will discuss the specific applications of digital media technology in animation design.

3.1 Character design application

In the realm of animation development, character design plays a pivotal role. With the aid of digital media technology, 3D modeling has become a predominant creative approach in the animation industry. This method allows designers to meticulously craft characters from various perspectives. The advantages of 3D modeling are numerous, including enhanced accuracy and detail in character depiction. Moreover, by incorporating a skeleton system into the character, it becomes possible to simulate human actions and expressions, resulting in a realistic character portrayal. For instance, Blender software integrates the modeling process with a pre-set skeleton system, enabling designers to indirectly control character modeling via manipulation of the skeleton system, thereby minimizing complex and repetitive tasks. Additionally, designers can also generate the effect of 2D animation using 3D modeling and 2D rendering techniques. Take "Jewel Country" as an example, through the application of three-shading-two technology, producers can create smooth character action animations via modeling and present a stunning visual through 2D. Furthermore, manufacturers can also integrate 2D animation with the utilization of 3D modeling, reducing the need for excessive repainting or complex character movements in the process.

In terms of traditional 2D animation, digital media technology can also automatically create transition frames between keyframes by adding and setting keyframes on the computer. And by adjusting the animation timeline for more detailed adjustment, a more vivid and smooth animation presentation can be achieved. Secondly, digital media technology can also make it more convenient to process the color of the picture, improving the efficiency and quality of the color, adjusting the picture as a whole, and reducing the technical requirements for the production personnel^[4].

3.2 Application on scenario design

Digital media technology is also widely used in the creation of scenes in film and television animation. As far as current film and television animation works are concerned, most of them involve the participation of digital media technology. With the support of digital media technology, the expressiveness and effects of film and television animation have been enhanced, making them more vivid and iconic, thus increasing their appeal to the audience. For example, digital rendering technology is used to simulate light sources and material materials, replacing manual rendering and greatly alleviating demands for manpower and time. Designers can change the light sources within a scene through digital rendering technology; at the same time, they can adjust the texture of the scene, such as the reflection of the light sources and the grain of the materials making the environmental background more realistic and harmonious by adding details and texture, thereby providing the audience a better viewing experience. At the same time, designers can also combine modeling with real scenes through graphic processing, such as synthetic images and virtual landscape technology to create a variety of fantastical and novel scenes, such as future cities and natural wonders that defy physical laws. By vividly presenting all kinds of fantasy scenes to the audience, the distance between film and television animation and reality is blurred, offering viewers a new visual experience.

3.3 Application of Special Effects

Another important application field of digital media technology in animation is digital special effects. Creators can simulate particle effects or physical interactions within a scene using a particle system to add more vivid and influential visual effects to the animation. For example, different particle properties and style can be set in the computer, such as fire, explosions or atmosphere particle, so as to enhance the expressive power of the picture. As one of the indispensable element of the film and television industry, special effects have made a vital contribution to its development. In most fictional films and television works, such as science fiction or fantasy-themed productions, the content, the creatures and scenes in the film are completely fictional, like monsters or specific planets. For example, most of the scenes and creatures in the movie "Avatar" could not be directly captured in reality. If such non-existent images need to be shown in film and television, special effects professionals can provide help.

At the same time, the use of film and television special effects can also avoid some safety issues. When encountering dangerous and high-risk scenes, such as jumping off a building or an explosions, special effects can create thrilling and exciting scenes without safety issues. Film and television special effects can also effectively save time and financial costs. For example, scenes that require the portrayal of thousands of troops, such as battles, can avoid the expense of finding a large number of extras by using film and television special effects, and the corresponding shooting time will also be significantly reduced.

4. Outlook on Digital Media Technology

Due to the rapid development of science, technology and economy, digital media technology has been widely applied, particularly in film and television animation. Digital media technology has become an inevitable trend in the development of the film industry. Its continuous advancement will further promote the prosperity of the film and animation industry, delivering more excellent film works to audiences.

4.1 Enhancing the Original Capability of the Animation Industry

The development of digital media technology has offered new possibilities and directions for animation creators, enhancing the innovation and diversity of the film and television industry. The production threshold for film and television animation has been lowered, making creation and innovation easier and leading to a diversification of animation products in the market. Animation production is no longer limited to large teams; with the help of digital media technology, the development of individual animation has gradually risen. In the case of a significantly reduced production threshold, more out-of-the-box ideas can be presented. At the same time, animation creators can use digital media technology to achieve more freedom in their creations, thereby attracting more attention and favor from audiences ^[5].

4.2 Expanding the Animation Market Scale

Under the support of digital media technology, the animation industry has developed rapidly worldwide, and the distribution and audience base for film and television animation have expanded rapidly. Against this backdrop, there is a growing increase in the demand for elites in the market. As digital media technology continues to develop, the demand for professionals in the animation market will continue to increase, presenting vast job opportunities within the animation industry.

Today, the role of digital media is becoming increasingly important, and its positive bearing on film and television animation will gradually increase, providing a wider development space for the development of film and television animation and expanding the market scale ^[6].

5. Conclusion

Digital media technology has greatly propelled the development of the animation industry, with the two becoming increasingly interrelated. The progress of the animation industry is inseparable from the foundation established by digital media technology, which in turn is also constantly updated and iterated due to the development of the former.

There is no denying that digital technology is an inevitable by-product of societal progress, which has a huge positive impact on both animation production and dissemination of animation. Digital media should be promoted by people to better enhance quality of animation industry, with its potential being explored in the realm of animation industry.

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