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The Application of Subjective and Objective Color in 3D Animation Scene Design

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Abstract:- With the advancement of technology, the development of 3D animation continuously updates its production tools and methods, bringing convenience to the animation producer and new visual experience to the audience. However, no matter how the technology changes, color, as one of the important components of a picture, still deserve our careful study and repeated scrutiny.

This article analyzes the characteristics of subjective and objective colors and their role in the convenience of emotional expressions. It expresses the importance of subjective and objective colors in the design of 3D animation scenes. In addition, we will use content analysis methods to study further the impact of subjective and objective color on the design of animation scenes. And they are trying to find some guiding principles for applying subjective and objective color design in animation scenes. An excellent animation scene needs to use subjective colors to express the authenticity of the story's background. At the same time, it needs to use subjective colors to improve the quality of the whole picture and make a leap. In the end, it shows the emotion and spiritual level that the animation creator wants to express so that the audience can get emotional resonance when watching the film. The major topics of this research are how to reasonably use subjective and objective colors in the production of animation and the kind of artistic effects are produced. Finally, the article applies the above research results to the work "DEEP" to combine technology and art perfectly.

Keywords:- *Animation scenes; Subjective color; Objective color.*

I. INTRODUCTION

The color form of animation is becoming more and more perfect with the help of the color experience of traditional painting, and it has become a unique and comprehensive language system.[1] Director Zhang Yimou once said: "In film art, color is the most resonant element in people's thoughts."color has become an increasingly important styling element in movies. With the development of modern technology, film and television animation scenes have more ways and means to use colors.[2] As one of the characteristics of oil painting color creation, subjective and objective colors play an equally important role in film and television animation.[3]

Compared with the past, the scale of current Chinese animation has expanded a lot. But the primary audience groups are primarily young children and children.[4] Compared with general film and television animation, this animation has a more straightforward plot and a simpler screen structure. Even if a small number of animations are aimed at audience groups of teenagers and above, the artistic value of animation in this type of animation is subject to certain restrictions.[5] In response to this situation, from the subjective and objective color research of animation as the starting point, the application of color aesthetics in animation is analyzed and used in animation, hoping to increase the artistic value of animation creation.

A. Objective color

Objective color refers to the true color that anyone with normal visual physiological functions can feel under the action of light in nature.[6] In the natural environment, color presents objectively. As we can clearly perceive turquoise grass, blue sky, clear streams, and colorful flowers, color becomes the embellishment of the world. Likewise, in the design of animation scenes, color has a certain objective existence. The color of the real world becomes the source of color inspiration in animation scene design, which is a bridge to ensure that the viewer can objectively build emotions and perceive the content of animation works.[7]

B. Subjective color

The subjective color is the color created by the artist in the long-term life through logical thinking and image thinking and using artistic means to reproduce the objective color truly. The expression of subjective color is a re-creation of the objective.[8-10] The accumulation of color perception from the real world and constant real-life observation allows the understanding and awareness of color to rise to a certain level of creative consciousness. The saturation of the color, brightness of light, etc., are reasonably adjusted to create a new scene picture with specific aesthetic characteristics. It is a process of sublimating the connotative meaning in the animation work.[11]

Design with subjective colors can participate in the narrative as well as express meaning.[12] Use subjective colors to create animated images to express character, mood, theme, etc. Then the subjective combination of light and color will enhance the performance of the situation, and the work will be fuller and more dramatic.

In the color design of animation scene, subjective and objective color are in correspondence with each other. Neither should not be neglected when designers work with color in animation scenes.[13-16]

II. RELATED WORKS

A. The use of objective colors in animation scenes

In the animated film 5 Centimeters per Second, Makoto Shinkai objectively reproduces reality, using many inherent colors in the scene, so that every detail can restore real-life(Fig.12).

The objective color is based entirely on reflecting the color of natural objects, adding complementary colors to the inherent colors of the object. Or adjust or change the color contrast between warm and cold, and finally make the picture have a certain color tendency.[17] Let the whole picture present a calm tone or a warm tone.

Fig. 1: Realistic scenes

B. The use of subjective colors in animation scenes

There is a solid subjective color between the paragraphs of the animation The Lion King(Fig.2).In the clip, Scar is discussing a plot to murder Mufasa with the evil wolf. Fluorescent yellow light reflected on the stone wall set off the Scar of the opposite character. Green gas ejected from the ground, the scar ambition gradually revealed, and the dark green light became brighter. As the scars recounted their tactics, their emotions grew higher and higher, from the evil green at the beginning to the yellow representing jealousy and betrayal. The scar is like a leader, with an army of evil wolves under his feet. Finally, the Scar jumped in-depth, and suddenly one turned yellow to deep red. The scar was full of confidence in the plan this time, and the excitement that could not be concealed was intertwined with evil, and his emotions reached their climax at this moment. The color between the fragments is progressive, from green to yellow to red, revealing the cruelty and insidiousness of the Scar and laying the groundwork for the development of the following story(Fig.3). And these subjective colors have played an irreplaceable role.[18] The viewing experience of the audience also changes continuously with the change of the scene color.[19]

Fig. 2: Use of subjective colors

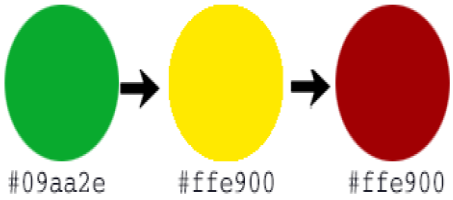

Fig. 3: The change of Subjective color

III. SOURCE OF INSPIRATION

Although subjective colors and objective colors generally influence and intersect each other, animation works should first be based on the colors that exist objectively. As the saying goes, "design comes from life", all real colors are the original materials created by designers and are the emotional basis for the interaction between animation works and audiences. In the animated short film "DEEP", the basic conditions inside the volcano were first considered, and the objective color of the object was first adopted for the scene model and lighting color.

Afterwards, the "objective colors" are refined and artistically processed according to the development needs of the plot to form a "subjective color" that meets the development needs of the work. Finally, the viewers can communicate their emotions with the pictures, and sublimate the actual connotation of the illusory story emotions.

IV. PRODUCING

A. Means of Photographing

Fig. 4: Internal structure of the volcano

Fig. 5: Magma

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The animated short film "DEEP" mainly tells the story of a bird who was extremely pretentious and greedy, when falling into a volcano with gems during an eruption, choosing between "wealth" and "life" at the last moment (Fig.4).

To create a momentary "tension", the color of the background model in the picture follows the objective colors of the natural world, and deliberately adds cool colors to the light to enhance the saturation and contrast of the light, and highlight the light and dark of the picture. At the same time, spotlights are used to focus people's attention on the gems falling into the volcano and the rising magma, portray characters, strengthen the visual impact, and induce tension.The audience can't help but think about what choice they would make if they were that bird. Choose to live and abandon the gems in the volcanic cave? I still choose jewels and let my life come to an end(Fig.5).

B. Means of Producing

After looking for a lot of reference materials, I made an indoor volcano model. Make model texture maps (objective colors) according to objective existence(Fig.6).

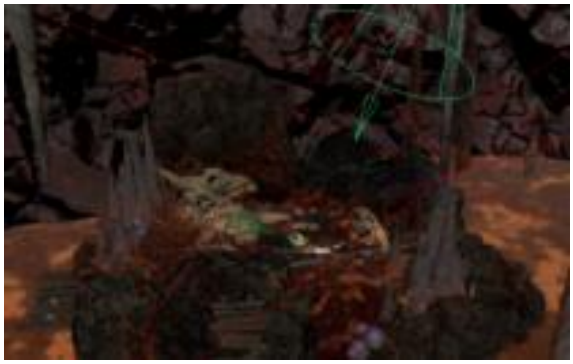

Fig. 6: Modeling of the volcano

Subjective color lighting was added based on objective lighting. In the early stage of the actual volcanic eruption, lava overflowed, and the whole picture was blood red and bright (objective color). It is impossible to see the existence of cool colors (subjective colors). The author deliberately added a non-existent calm tone (see blue light) to imply freedom and hope at the crater when making the lighting here. Subjective hope that the bird will lay down the gems and fly out of the crater to pursue a new life. The combination of subjective and objective colors here can enhance the expressiveness of the scene and make the work fuller and more dramatic(Fig.7).

Fig. 7: Lighting settings

By adjusting the light color, intensity, and overall atmosphere of the parameter screen, the nervous atmosphere can be adjusted(Fig.8).Finally, the video rendered with ARNOLD was put into AE for post-processing. In the creation process of an animated film, the color of the picture rendered in the early stage will not perfectly meet the needs of the film creation. At this time, the color correction in the later stage is significant. The color correction of the film is the second part of the animation designer for the animation work. Creation, once again using artistic means to reproduce objective and subjective colors indeed.

The color correction tries to make the color of the animation screen reach the maximum reproduction of the color to meet the color requirements of the movie. The subjective adjustment of the color of the film is to correct the color according to the film's style, tone, and emotional content. This animated short film uses the color correction of After Effects software, adjusts brightness and contrast, sharpening, color scale (Hue), natural saturation (Saturation), specific color selection, SA Color Finesse 3, color curve (Curves). The re-creation of subjective and objective colors in film and television animation makes the animation works more artistic and enjoyable.

Fig. 8: Modify the image color tone by modifying the hue/natural saturation (Hue/Saturation)

V. CONCLUSION

In the creation of animation works, subjective and objective color design is included in every step of animation creation. For scene design creators, in the case of following objective colors, based on the animation creator’s positioning of the storyline, reasonable adjustments are made to the saturation of the colors in the screen, the brightness of the light, etc., to create new scene pictures with certain aesthetic characteristics.

Improve the artistry and aesthetics of subjective and objective colors in the design and construction of animation scenes, and promote the use of colors to achieve a kind of power to build the atmosphere of animation scenes. Finally, the viewer and the creator of the animation work will have the same emotional resonance across time and space, allowing the viewer to feel the joys and sorrows of the protagonist in the animation work through the scene design of scenes.

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