Application Research of CG Painting in Digital Age

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Abstract. CG painting is the collision and blending of contemporary technology and art. What attracts majority of art lovers and experts to dive deep are their unique artistic charm and new forms of expression. With the sustaining improvement of the hardware and the development of the new computer software, CG painting makes the development of contemporary art and future art more possible. This article mainly studies the CG painting's artistic features; technology and application in the digital age, and put forward some suggestions to the development and establishment of present CG painting in our country.

1. Introduction
By CG is meant the computer graphics. It's a discipline aims to realize the related art creation by using computer to represent, generate, process, display and utilize graphics. In digital age, CG represents the collision of advanced technology and contemporary art. Along with the development of computer technology and the related art professional software the interactive CG art has been widely used and popularized in different fields. At present, CG painting has permeated into various industries, such as website design, film and television animation, print design, architectural design and military, etc. It deeply influences and changes people's life. Now, with the social economic development of our country and the progress of scientific technology, CG's tendency of development is continuous increasing. Its internal industrial structure is constantly optimized and at the same time some excellent industries are also gradually going abroad and into the internation. In 2006, the Chinese film MOBIUS RING with a total investment of 150 million yuan from China and America is the first CG event movie in our cartoon animation industry. Its appearance marks China’s successful exploration of the field of CG film and television and shows our determination and strength of CG technology application.

2. Research on CG Painting Art
CG painting is also known as the digital drawing. It is a computer graphics a new form of art expression which uses digital devices, image processing software and digital technology measures to create a painting. It a time product combined digital technology with art. Although CG painting is very different from traditional painting in the technology application and expression, it also belongs to visual arts and has the functions and characteristics of painting art. At the same time CG painting can create a virtual art world which has strong visual impact, realism and interaction to bring the public a better visual experience and an aesthetic enjoyment. CG painting mainly has the following artistic characteristics:

First are accuracy and facticity. Its high accuracy mainly reflects in both shaping of geometric forms and the expression of color. In CG painting, efficient and convenient painting softwares include different tools, such as grid, color harmony, modelling tools, brushes, texture mapping and rulers, etc. With the high precision calculation and program of computer, the precise scale geometric figure can be drawn. Utilizing the software 3DMAX can help draw and perfect object modellings to make the geometric perspective more accurate and the texture of material stronger. In addition, the object can be changed and homogenized by color filling of the PS software. Doubtless, compared with traditional
painting art, CG has more advantages in accuracy of modellings and facticity of colors. It can make paintings be more exact.

Second are variable art styles. The shaping of CG painting in modeling ability and color order are accurate and realistic. It can create a fantasy realistic artistic effect and make paintings be more impact and infectious. All of these are the reasons of CG painting art styles be variable. In the bottom plate panel of CG painting software, there are drawing, watercolor, printmaking and other rich and diverse art forms. Painters can choose what they want according to their creative needs. Moreover, CG can combine with several artifice languages like video and painting to cut and recombine the material, finally realizing a rich and unique artifice effect based on the ideas of painters. Some strange and grotesque painting images such as flying castles and a monster with human face and beast body can make painting works be more artistic and aesthetic.

The third is interaction. Interaction is the heart and soul of CG painting. It is a function and characteristic which traditional painting art doesn't have. CG painting can create some two-dimensional or three-dimensional works and combine several targeted and creative art elements. Words, actions, sounds and pictures can be combined by utilizing the video multimedia functions of computer and drawing and composing functions of software technology to construct flash cartoons or SD cartoons which are full of Interactivity and so on.

The forth are efficiency and convenience. People work more efficiently because the software of computer develops very fast and the CG painting based on computer technology is more efficient and continent in the production process, work preservation and dissemination mode. In traditional paper painting age, the creation and completion of a painting may have to go through continuous conception and modification. But due to the particularity of the paper material, the alteration and preservation of traditional painting has many disadvantages. However, the CG can store and spread in the form of electronic document, it is good for people to enjoy and evaluate. So it makes communication freer and more efficient. In addition, the digital information and its productions of CG can be rapidly processed and repeatedly copied. When finished the works, it can be collected in a picture book by connecting with digital printing binding equipment. And CG works are clean, tidy and richer in color expression. It can not only meet the aesthetic needs of modern people but also easy to mass produce in factories.

3. Technology and Application of CG Painting in Digital Age

3.1. CG Painting Technology in Digital Age

First is digital flat painting technique.

Digital flat painting technology is the most widely used technology in the field of CG painting at present. It mainly according to computer graphics efficient image technology and convenience to create graphic art works. Utilizing computer-sense plane painting can quickly and accurately design a variety of geometric shapes, points, lines and surfaces, can create combinations of different geometric shapes, can make creative works by pushing RGB three basic colors and can accord to the design make the needs of accurate and rapid color change, fill in or gradient fulfilled. At present, the technology mainly applies in fields of fashion design, advertising design and book binding design etc.

Second is 3D digital technology.

CG painting makes 3D design possible. Now under the support of CG painting technology 3D design has had great development. It widely applies in architectural design, industrial design and especially in film and television special effects production. At the same time, it combines computer graphics technology with related virtual technology to construct virtual reality technology and promotes the innovative development of visual art.

3.2. Design Application Category of CG Painting

First in field of art design, it contains flat art design, industrial modelling design and environmental design.

In flat art design, designers can use CG painting simplify the workflow and create various plane design works. For example, in traditional fashion design industry, the application of CG painting facilitates designers to check and modify works, quickly finishing the garment pattern making and
marking. It can also establish a printing symbol as a version of the icon system efficiently and improve the efficiency of the operation process.

In industrial modelling design, CG painting art is widely applicated. Designers can finish different painting assignments and program optimization efficiently by utilizing CAD and CAM computer aided technology. In traditional design field designers express three-dimensional space with two-dimensional space. This makes it difficult for designers to accurately convey their creative ideas. But with 3D modelling and simulation technology designers can accurately display the internal and external structural characteristics and performance of industrial products and dynamically display the appearance, facilities and location of product. According to the needs of design, using softwares can help change the object shape, lighting and surface texture to efficiently complete the production of three-view screen and provide designers good design environment. Such as in the design of perfume bottles designers can draw the plane painting in AutoCAD firstly, then import 3DMAX to draw 3D stereogram and finally through the rotation, angle transformation to observe, modify and determine the shape. After completing the modelling, selecting a material pattern in the material library and edit it to further render the visual effect of the perfume bottles. When finishing the material rendering, the production of perfume bottles comes to end by adjusting and modifying the color, decorations and modelling with computer painting technology.

In the field of environmental art design, CG painting art is also playing a quite important role. The CG virtual reality technology can realize the visualization of virtual building and make environmental design works be more functional and artistic. According to the design creativity and concept needs, based on digital image processing techniques, designers can use engineering to design simulation, multimedia propaganda video and architectural representation to establish and present virtual future scenes so that the ideas and imaginations can be turned into a visual design effect. For example, in indoor design designers can first draw indoor plane painting in AutoCAD and then enhance the visual effects by importing 3DMAX to generate 3D design drawing. It not only benefits designers to communicate with consumers but also good for designers to refine and modify parts, at the same time is helpful to improve the efficiency of scheme design and implementation and optimize the indoor design works in final.

Second is multimedia field.

In animation field, with the improvement of computer technology and the reform of traditional cartoon, the production and application of computer special effects are more and more extensive at present. CG painting has been an important content in the production of modern animation. Differing from the traditional animation product, the modern animation based on computer technology has more advantages such as the manipulation is easy, the painting function is powerful, the division of labor production is distinct, the creation freedom is high, the interaction and the visual impact is strong and so on. Among them, the Flash graphics production technology adopts network streaming media technology which accelerates the communication and spread of animation on the Internet. Such as the domestic animated film Pleasant Goat and Big Wolf. It takes advanced digital technology to innovate costume and modelling design, build vivid and cool film scenes in production progress. Compared with two-dimensional animation of TV series, the film version is stronger and more powerful in visual effects.

In the field of film and TV media, the CG special effect movie which produced based on CG painting technology is a very popular genre in the current film and TV industry. The CG movie is mainly utilizing computer graphics to generate scenes, characters objects and other visual products. At current film industry, combining the film and TV production with CG painting technology can enhance the commercial and artistic value of the film. For example, the 3D movie Avatar which spent 4 years and supported by CG technology is the symbolic work of the world's cutting-edge technology films. In this movie the characters like avatar, navi and other planet creatures are produced at the first time. And then coloring and modifying the parts with PS techniques. At last the two-dimensional works are imported into Zbrush software and transformed into three-dimensional digital model. For further improving visual effects, the movie also adopts virtual cameras and real-time motion capture system to accurately produce high-definition rich film and television pictures. Now, except the contemporary work Avatar, the films Banquet at Hongmen and The Painted in our country are widely
applying the CG technology. And the application of cutting-edge technology makes movie more commercial potential and entertainment value.

In electronic games, the CG painting technology is mainly used to establish virtual scenes for games' conception. First the expression of virtual scenes needs to simulate the shape, texture and spatial position of real creatures by game programming and needs to simulate mountains, lakes, buildings and various lighting effects by using simulation graphics technology. Second, for designing a creative character and taking a immersive story experience, finally the efficiency and consistency of game operation and action pictures should be made efforts to improve. In the modelling of a video game assignment, a lot of CG painting techniques are required in body proportions, three views, hairstyles, costumes and props. Such as the film Warcraft produced by American Entertainment. It is popular around the world and famous for gorgeous animation scenes, magical character modelling, unique game mode and a virtual, humanized and immersive game world.

4. The Development and Construction Strategy of CG Painting in our Country
At present, relative to the global CG painting development situation, there are still a lot of shortcomings of the CG painting in our country in technology, creativity, concept and market building, there is still a large developing space.

4.1. Enhance the Interaction between Art and Technology
CG art is a comprehensive subject. It refers art, digital technology, direction and any other arts. So, it is very easy for designers to get into quandary which called designer's ability quality unidirectional when they meet the intersection of technology and art. At that time, designers are not able to attain both abilities at the same time and it is the main reason why the domestic CG painting technology doesn't take a breakthrough for a long term. Therefore, when you don't have the ability to fully integrate and achieve a balance between technology and art, a combination of teams can be adopted. That is organizing professional talents, divide labor, cooperate and struggle in groups. And it finally jointly creates excellent design works that is the combination of art and technology and positively Interact with each other.

4.2. Maintain the Extensive Native Characteristics
Under the developing tendency of cultural globalization, foreign excellent CG painting works flow into our country and makes certain influence in domestic CG painting circle and obviously affects audience's aesthetic at the same time. Because of this, many designers in our country are used to applying and imitating foreign works in CG painting. So their works are lacking content and the value is not high. Innovation is the soul of the work; an excellent designer should design and create works with personal style based on native elements and realistic condition. Their works should be endowed with native, symbolic and novel features. At present, under the prosperous development of CG painting art, our CG painting should pay more attention to the return of the local culture. Successfully using Chinese elements to create excellent art works with cultural connotation and dissemination value and interprets novel and vivid artistic stories with unique words and actions.

4.3. Pay Attention to Talents
The quality and number of talents is the key to the survival and development of an industry. The development road of CG painting art also needs to take the talented person as the solid dependence. So it is very important to cultivate the quality and quantity of talents in this field. To this end, we should enhance the study and cultivation of further technology. Now most knowledge, concepts and technology development tools of CG painting are introduced from abroad, the limitation of technology leads to a passive CG painting development. Because of this, we should always keep a keen sense of new technology, deeply learn the experience of other countries, research our own software technology and devote ourselves to promote the development of CG painting art by technology processing. Besides, not only the technology needs to be renewed, the concepts and minds also need.CG painting is the age combination of technology and art. With the development of science technology, the artisitic concept and tendency of contemporary visual art are constantly updated and advanced. The design
concept of standing still will limit the generation of excellent works. The age's development and promotion drive the development and revolution of art; it also ruthlessly strips away the backwards and obsolete contents at the same time. Therefore, the large number of CG painting lovers must also update their concepts, strengthen self-learning and practice, brave to explore and innovate and constantly improve their artistic concepts. Chinese CG painting can be flourishing only by keeping the technical progress and concept update.

5. References
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