








Auxiliary Application of CAD Technology Under the Internet of Things Platform in Painting Creation

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Abstract. In the Internet of Things environment, computer graphics has become a new artistic creation method. Some artists explore the many possibilities of painting in different ways. In the stage of painting creation conception and sketching, reasonable and appropriate drafting technology can improve the processing effect of the artist's original works. This technical method can inspire the creator's own imagination, and then prompt the creator to complete the sketching efficiently. It is very beneficial for artists to try new ways of working to expand the form of artistic creation. At the same time, the value of art lies in the ability to create. The painting creation under the computer graphics technology is the exploration and innovation experiment method of artistic innovation in the new era. Painting creation under the control of artistic concept, on the one hand, needs to rely on the improvement of technical level; on the other hand, drawing technology has become a means and tool to assist artists in their creation. Therefore, it is necessary to inject the artist's unique personality and deep emotion into the artistic creation, in order to make the perfect integration of high technology and art. This paper studies the application of CAD technology in the field of painting creation under the physical network platform. First, this paper summarizes the application status of drawing technology in the field of art; secondly, this paper introduces the influence of computer technology on some painting creations. Finally, this paper focuses on Discuss the application of computer graphics technology in the sketching stage of painting creation. This drawing method advocates a simple creative concept, emphasizing that creators

rationally use high-tech, new materials, new concepts and other means to serve the painting creation.

Keywords: Internet of things; CAD technology; Painting creation; Auxiliary methods.

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1 INTRODUCTION

Since the 1960s, graphics worldwide has entered a new era of development. Computer graphics has also developed rapidly, and this technological progress is a brand-new opportunity for workers in the field of art and for those in the computer field. Liu [1] believed that the continuous development of computer graphics has helped artistic creators to create graphics using computers. The application of this new technology provides a new impetus and source for artistic creation. Goharinejad and Hajesmaeel [2] believed that the vast number of researchers in the field of graphics have identified the combination of CAD technology and painting creation as a new exploration direction. Based on this, computer graphics has made some progress in recent years. Especially in the classic photorealistic drawing, computer technology can achieve the effect that the conventional drawing mode cannot bring. Machine-automated mapping is not a recent phenomenon. As early as the 1870s, Impressionist painters had held exhibitions related to computer automatic drawing, showing a new artistic style of painting to people all over the world. Liu et al. [3] believed that the drawing technique symbolized a major step forward in Impressionist art painting towards the modernist style of drawing. Since then, there have been many movements in the art world, including the Cubism art work drawing school and the abstract art work drawing school. In addition, the art world has also sprung up the expressionist art painting genre. Experts in these fields mainly emphasize the artist's creative ideas and subjective expressions of inner emotions. Mori et al. [4] believed that the works of art become the material medium for artists to carry out spiritual communication. Artists express their artistic concepts and ideas to the world through artistic works. From the perspective of leaders of different genres, paintings are not simply to reflect the scene to the audience with narrative images, but to emphasize the artists' real emotions and inner thoughts. Many experts and scholars in the field of art and computer have explored this technology, and have publicly expressed some of their views and remarks. For example, artists and experts in the field of computer research, on the one hand, study drawing methods and techniques with machine-automated imagery, and on the other hand, how this technology can be applied to painting creation. In addition, Lapborisuth et al. [5] believed that the domestic and foreign scholars have carried out research on machine automatic drawing methods and technologies supported by computer CAD technology. These shortcomings of computer graphics also lead to certain concerns about photorealistic rendering techniques. The occurrence of this situation, to a certain extent, also shows that the current photorealistic rendering technology has limitations. In particular, the photorealistic rendering technology with a history of more than 40 years still has some limitations in many aspects [6]. First, photorealistic rendering techniques are too accurate, which makes people feel unrealistic about the artwork. Secondly, the information processed by photorealistic rendering technology is too complicated, which makes it difficult for people to distinguish the key content among the numerous information. Third, the photorealistic rendering technology does not feel soft enough, and in many cases, it feels blunter. Finally, in photorealistic drawing techniques, there are many important details in the processing of artistic paintings that are difficult to be properly emphasized [7]. We can feel the existence of these technologies from the movie "Titanic" shot with early three-dimensional technology. By the end of this century, some films with visual impact have gradually entered the market, and people have really felt the huge impact of computer art on people's lives. At the same time, these computer technologies also show people the great application potential of computer graphics in the field of painting and drawing [8]. Research in related fields such as computer technology has achieved great success in the creation of image realism. But at the same time, the

application of these new computer technologies also created some new problems. For example, because photorealistic painting provides very precise feedback on reality, it can cause artistic paintings to lack the artistic sense they should be. The phenomenon that paintings generally lack artistic sense is constantly emerging, and it is difficult for this technology to accurately express the way of thinking and artistic conception conveyed by the painter to the audience [9].

1.1 The Development Course of Digital Technology and Painting Creation

The automatic drawing method of machines is beneficial to people to improve the traditional hand-drawn works of art. People have improved traditional image rendering methods by using computer simulations. Generally speaking, the digital painting images obtained through this study are more vivid and interesting than real graphics, and are more personalized. The research mainly deals with how to create more aesthetic and practical images. Of course, in this case, people's research is not limited to physics-related fields. In addition, researchers are placing increasing emphasis on research in traditional fields [10]. This emerging field of research is called machine-automated rendering. The research content of automatic machine drawing is mainly to summarize the paintings with different morphological expression effects, and simulate them by means of computer drawing. The drawing technology of machine automation has developed rapidly in recent years, and has received the attention of many experts in related fields. The Application Mode of Computer CAD Technology and Physical Network Technology in Artistic Drawing (the picture is drawn by the author) is shown in Figure 1.

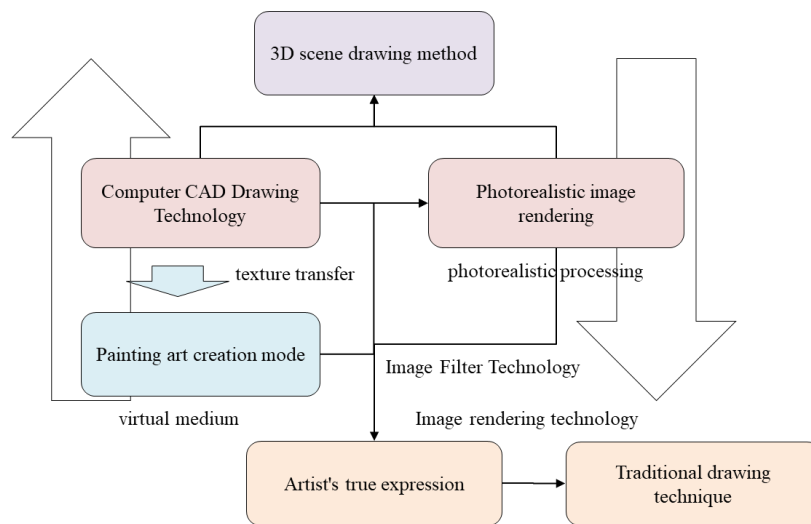


Figure 1: The Application Mode of Computer CAD Technology and Physical Network Technology in Artistic Drawing (the picture is drawn by the author).

1.2 The Correlation Between Computer CAD Technology and Painting Creation

Computer CAD painting and traditional painting techniques are related to and different from each other in form. These two technical methods are interdependent and complementary, and their existence provides human beings with a variety of visual aesthetic choices and meets people's diverse needs. From the point of view of the time of production, traditional painting was produced earlier than computer CAD painting. Therefore, the technique theory of traditional painting art has become the theoretical source of computer CAD painting art. For example, artists have their own considerations for the methods and steps of computer CAD painting creation, as well as the configuration and grasp of various color tones. These contents include the expression of form, the

embodiment of light and shadow, and the expression of the perspective state of space. These forms of expression all come from the technical theory of traditional painting art. The integration of traditional painting genres and different styles of artistic concepts plays a guiding role in the selection of computer CAD painting themes and the expression of artistic techniques. For example, different brush types set in computer graphics can handle different painting scenarios. Artists can get many different personalized brushstroke shapes by changing parameters such as transparency, graininess, pressure, and viscosity of oil brushes. These painting brushstrokes can quickly imitate the artistic expression techniques and styles of different painting masters, reflecting the style characteristics of Impressionist artists. These technical styles can show that there is a direct connection between traditional painting schools and the formation of computer CAD painting styles.

2 THE INFLUENCE OF DIGITAL PAINTING TECHNOLOGY ON PAINTING CREATION

2.1 Digital Painting Technology Can Enhance the Creative Inspiration of Artists

Generally speaking, as the subject of "artistic production" and aesthetic creation, the artist can only recognize and transform reality through life practice. Only on the basis of understanding life can an artist create works of art that reflect the beauty of reality. In this process, it is necessary to further develop the active role and personality of the artist. The main purpose of any artwork creation is to effectively disseminate the ideas of artworks, so that more people can experience and appreciate the artworks visually, so as to resonate and realize art sharing. Therefore, the creation and sub-item of art are essentially the same in communication. The Comparison of Differences between Computer CAD Drawings and Traditional Drawing Modes is shown in Figure 2.

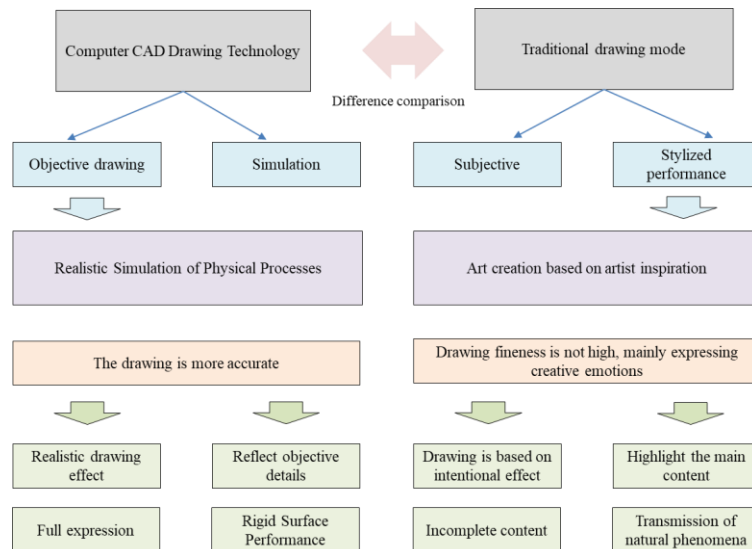


Figure 2: The Comparison of Differences between Computer CAD Drawings and Traditional Drawing Modes.

2.2 Emerging Technologies such as the Internet of Things Support the Complex Needs of Creation

There are differences between computer CAD painting and traditional painting forms, which are embodied in the different material media used by the two. Material media is the premise and foundation of artistic creation activities. It not only determines the classification of artworks and

judges the different aesthetic styles of artworks, but also has a profound impact on the creator's thinking and techniques. Traditional painting is to use tools such as pens and knives, ink, pigments and other material materials to paint on flat tools such as paper, wood, textiles or walls. For example, Chinese painting uses different types of rice paper, which can change the adaptability of brush and ink and enrich the expressive effect of brush and ink. However, computer CAD painting requires artists to use bits and bytes to use computer graphics software to express their aesthetic understanding, artistic conception, artistic communication and production. This painting mode is mediated by virtual numbers, and different material media have different natural aesthetic properties. In terms of expressing human emotional experience, digital technology can give viewers the perception of real visual existence. The scene construction method based on vector graphics can fully enlarge the local painting effect. The computer CAD drawing mode can perform this mode on the real scene in the virtual reality work, so as to present the different formal aesthetics of the work. The Comparison of the effects of computer graphics inspired by different artists is shown in Figure 3.

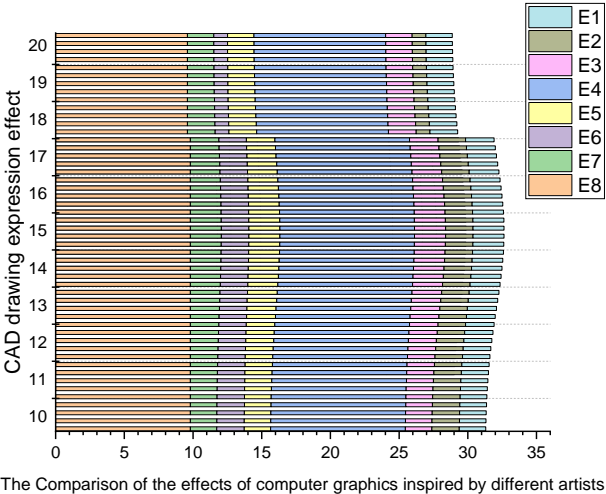


Figure 3: The Comparison of the effects of computer graphics inspired by different artists.

2.3 Digital Technology can Make Artist Creation More Contemporary

There are differences in perception in creation and cognition of cultural connotation of works between computer CAD painting and traditional painting mode. A work of art embodies the emotion of the artist. Traditional works of art are the result of the interaction between the artist's soul and life perception. A work of art can evoke exciting emotions in the audience, and a work of art is also the product of the artist's use of different creative materials and tools. Traditional painting works of art are full of affinity, with higher artistic aesthetics and historical and cultural accumulation. However, the expression technique of computer CAD painting technology is mechanical, and there are limitations in the selection of painting materials and the setting of brush parameters. In addition, this kind of art works cannot achieve the vividness and humanization of the expression style of traditional paintings, which makes computer CAD paintings lack affinity and psychological recognition in the eyes of the public. Nevertheless, we believe that computer CAD drawing technology is a product of science and technology. With the continuous development of technology and the passage of time, the artistic content in computer CAD paintings will continue to grow. The accumulation of historical and cultural heritage in works of art continues to deepen. This form of painting will inevitably form its own unique aesthetic value and be recognized and

accepted by people. The Application Process of Computer CAD Technology in Drawing Field is shown in Figure 4.

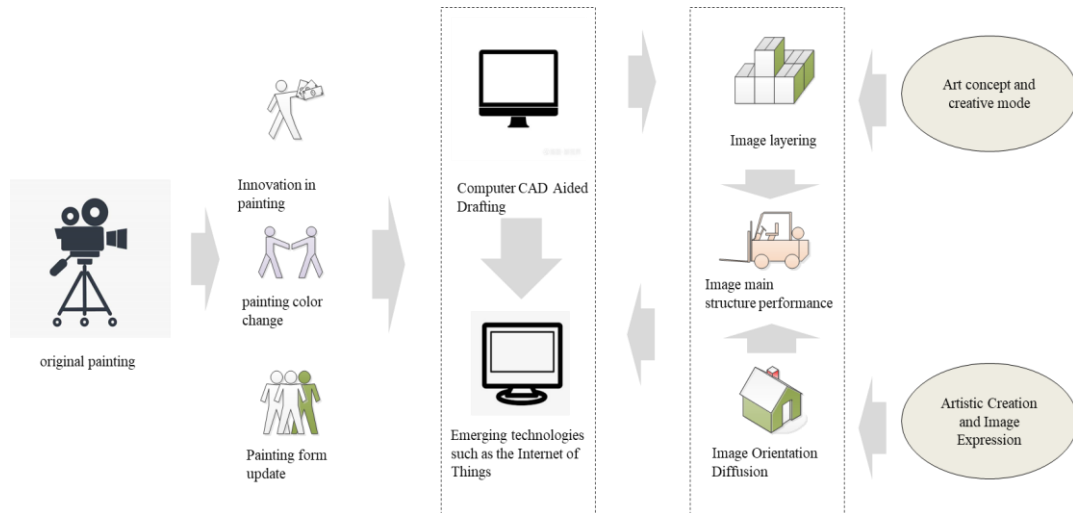


Figure 4: The Application Process of Computer CAD Technology in Drawing Field.

Computer CAD drawing technology has had an impact on the aesthetic thinking of the creative subject. Computer CAD drawing technology enriches the creative thinking of artists. Art creation is neither a simple technical operation of a craftsman nor a rigid mechanical material production. Art creation is an artist's thought process from intuition to memory, to association and understanding. The process of artistic creation is a complex and arduous spiritual production activity. These activities must be experienced by artists to make art. Artistic creation intuition is the artist's understanding of the phenomena and individual characteristics of things. The artist's aesthetic cognition activities are inseparable from intuition, but they cannot stay on intuition. The artist's artistic creation generates associations and understandings through representation and memory, thus further entering the thinking stage. The creation of art is that the artist recognizes the world in an aesthetic way through this spiritual activity, and expresses the aesthetic understanding and aesthetic emotion of reality through the creation of works.

3 THE APPLICATION DIRECTION OF COMPUTER CAD TECHNOLOGY IN THE FIELD OF PAINTING

3.1 The Art Disciplines Need to Strengthen the Use of Technology

Traditional painting has a long history of development and has gone through different eras of development. Different styles and schools of traditional painting have been jointly influenced by the political, economic and social humanities of different eras. This influence is not only reflected in the material conditions required for painting creation, but also in the painting creation thinking of the creative subject. Artists' creative thinking concepts will change with the development of the times, and finally present different styles of contemporary art works. The artistic creation process is the artist's observation, experience and aesthetics of social life. Artistic creation is also a process in which artists use material media and technical means to express life and reflect aesthetics. The production of painting works of art is a process in which the artist organically combines aesthetic thinking, creation medium and expression mode. Artists process and create real-life experience through artistic expressions such as points, lines, surfaces, colors, and compositions through

creative thinking. Artists use material means such as painting tools to form works of art with individual style and aesthetic value. It can be seen that the determining factor for the formation of works of art lies in the artist, and only through the creative thinking activities of the artist can the final form of the work of art with the artist's individual style and aesthetic value be achieved. The Comparison of Expression Effects between Computer CAD Drawing and Traditional Drawing Methods is shown in Figure 5.

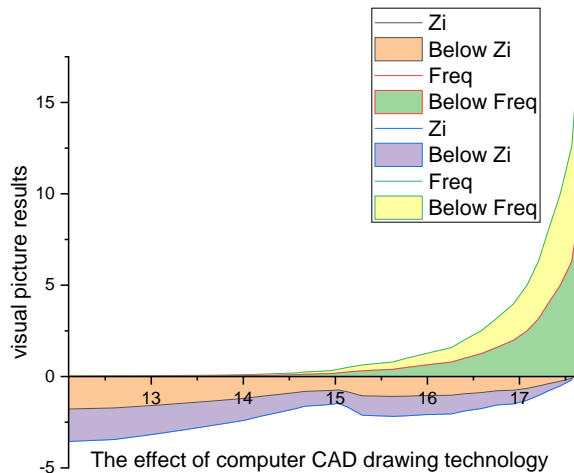


Figure 5: The Comparison of Expression Effects between Computer CAD Drawing and Traditional Drawing Methods.

In the early days, traditional painting forms were often limited by technology and times, making the subject matter and painting tools too traditional and monotonous and not rich enough. Artists are often limited to a certain object or a certain region in the subject matter of creation. However, with the application of computer CAD drawing technology and the emergence of digital network platform, the artist's creative concept has been changed. The new technology makes the artist's creative thinking not limited to a certain historical period or a certain type of subject matter. It is precisely because of the richness of current creative themes that the foundation has been laid for the richness of artistic works. At the same time, the widespread popularization of new technologies has made artists' creative concepts freer, more conducive to the use of their imagination and creativity, and further broadened their horizons. Computer CAD drawing technology has a strong editing function for materials, and artistic painting works are influenced by new technologies, which can enrich the subject matter of artistic creation. The works of art skillfully combine characters and urban buildings organically through beautiful colors and vivid pictures. This form of expression can show that the computer CAD drawing technology can have a profound impact on the contemporary art creation process. The application of new technologies can further broaden the creative thinking of art creators.

3.2 The Art Disciplines Need to Speed up the Training of Computer Graphics Talents

Computer CAD technology can make the creative thinking of artists more contemporary. With the continuous development of science and technology, computer CAD drawing technology has been innovatively applied in different fields. The application of this new technology makes the artistic language richer and more charming. At the same time, the application of this new technology also makes the creative thinking of the artist more contemporary. The development of Internet of

Things technology and digital 3D film technology has brought the visual experience of painting into a new field. People's requirements for visual experience have also been further improved, and they are no longer satisfied with the effect of two-dimensional pictures for paintings. The Internet of Things and the three-dimensional art form combine the principles of perspective and design to enhance the interaction between people and art. This form of technology breaks people's understanding of the art of painting and deepens people's feelings about the visual experience of painting. Artists are sensitive to the external environment, and artists have different knowledge and understanding of the subject and carrier of artistic creation. However, the application of new technologies in the field of art cannot be changed or resisted by anyone. Generally speaking, the painting composition mode based on CAD technology brings people a strong visual impact and leaves an unforgettable impression on people's hearts. The combination of three-dimensional image and painting produces a peculiar artistic effect, which increases the attractiveness of the picture, and at the same time fully reflects the contemporary characteristics of the artist's creative thinking. The Comparison of Expression Effect and Main Prominent Content of Computer CAD Drawing is shown in Figure 6.

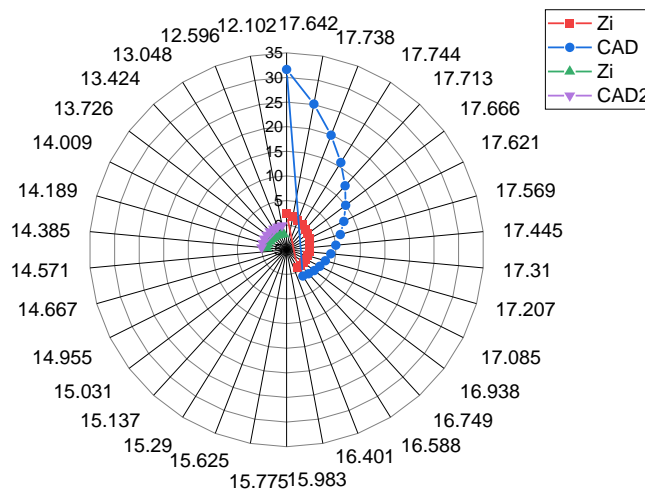


Figure 6: The Comparison of Expression Effect and Main Prominent Content of Computer CAD Drawing.

The influence of computer CAD drawing technology on the creative process of artistic subjects. Traditional art creation and modern art creation are different in all aspects of the whole thinking process. Artists who create fine arts need to go through a series of combing processes of "object-image-image". However, the creative thinking of traditional art creation and the creative thinking of computer art have undergone different changes in "object image", "image" and "image". First of all, in the process of painting creation, the main body of traditional art creation expresses the objective things known to the outside world through extensive collection of materials. This way of expression does not depend on the existence of human beings. It has shapes, colors, sounds, and flavors, which can be specifically perceived. Therefore, the material materials of traditional art creation mainly come from the real life of the artist, which is a real and intuitive objective existence.

3.3 The Art Discipline Needs to Strengthen the Research of New Media Art Theory

However, artists who use computer CAD painting technology can obtain a large number of creative materials from the computer database, so that the artist has a wider range of materials. This

technical method has changed the relatively monotonous way of drawing materials in painting art, and enriched the channels for artists to draw materials in their creative methods. In the process of artistic expression of paintings, the traditional main body of creation is to store material materials in the brain in the form of images. This kind of image information is unsystematic, intuitive and perceptual at the beginning. It has to go through the stages of repeated deliberation, refinement, analysis, classification, and summarization by the artist, and only after using creative thinking methods can a clearer new image be produced. This pictorial expression embodies the artist's aesthetic and ideological character. Therefore, the artistic expression process in traditional art creation is the core content of art creation. This process includes different stages of composition, line, color conception and conception. The Detail expression effect of computer CAD drawing technology in different Internet of things environments is shown in Figure 7.

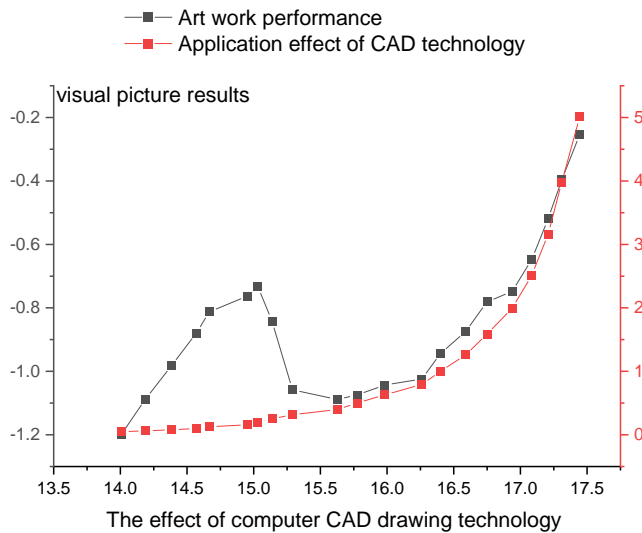


Figure 7: The Detail expression effect of computer CAD drawing technology in different Internet of things environments.

3.4 The Government Needs to Provide Guarantees for the Application of New Technologies to the Field of Art

In this process, the artist's creative ideas are difficult to express clearly and visually. However, in digital painting art creation, the artist can complete the intentional expression in the traditional painting conception process through the visual picture on the computer screen. By comparing and scrutinizing the intended works, the artist makes the artistic feeling in the concept into the artistic feeling in reality. This form of artistic expression makes the image and the image process more harmoniously unified, and then simplifies the repeated thinking process of the artist in the traditional creative thinking. In addition, in the process of artistic creation from object to image, traditional painting is a handmade work of art. These works are images that are formed over and over in the artist's brain. These intentions are sometimes disturbed by objective factors, and the artist suddenly forgets them. The limitation of this form of expression lies in the fact that the artist does not have a clear certainty in his creation from the object image to the image expression. This artistic creation process requires constant and repeated revision of the creative subject to complete. However, the continuous development of computer technology can change the traditional conception mode in artistic creation, and the object image to the image can be in place at one time. The use of computer CAD drawing technology by art creators has prompted art creators to have modern creative thinking. Various materials are editable in the process of

computer CAD painting creation. Traditional painting as an art, the use of techniques in the production process is very important. Traditional painting is the main result of individual labor, which can highlight the single behavior of the individual artist. Traditional painting techniques are the summary and accumulation of the artist's vast practical experience, and the objective reflection of the artist's understanding of reality. The creative process of the subject of painting is a complete process of the embodiment of reality and the reprocessing of art. The traditional painting process, from the composition to the expression of light and shade, from the color to the line, is a form of expression of the painting by the creative subject through artistic processing. This form of pictorial expression requires the subject of creation to have a solid foundation in painting. This drawing method requires the artist to have superb understanding and modeling ability. This also requires the artist to be able to coordinate the different relationships between the various elements in the picture. The artistic creation of traditional painting forms must go through the necessary drawing preparations and the creation process of repeated deliberation. Computer CAD drawing is the drawing work with the help of graphic image software. This drawing work is done using digital input devices such as pressure-sensitive pens.

4 CONCLUSION

The development of human society is moving forward in twists and turns. Today's society is in the midst of social changes, political adjustments, and economic changes, and people's ways of thinking and humanistic values are bound to be affected by the rapid changes in society. This influence will produce a fierce collision and confrontation of old and new values. Generally speaking, the art of computer CAD drawing technology that can adapt to the information society and the development of science and technology in the field of art creation in the current environment is in line with the development of the times. This new technology has contributed to the diverse development of the art of painting. The emergence of computer CAD drawing technology will not make the traditional painting form die out. On the contrary, the emergence of computer CAD drawing technology has promoted the development of traditional painting art form. The advanced meaning provided by the birth of computer CAD drawing technology does not lie in its own technical connotation, but in that it provides us with a new way of thinking. This kind of thinking is a new path opened up for the development of traditional art by relying on computer technology. Scientific and technological progress has always been the driving force for social development, and it has also promoted the innovation, reform and development of art. The integration of computer CAD drawing technology and traditional painting art forms not only broadens the creative thinking of artists, but also directly promotes changes in painting themes, creation methods and expressions. We must not only conform to the scientific and technological achievements brought by the development of the times, but also recognize the drawbacks brought by the digital age to the development of art. Artists need to combine the two reasonably and effectively. We can only regard computer CAD drawing technology as a tool and means for artistic creation, and cannot rely entirely on technology. Artists need to truly cultivate their solid traditional handicraft skills on the basis of mastering computer painting techniques. Only artists who perfectly combine computer CAD drawing technology with traditional painting forms can create contemporary paintings that are digitalized and branded with the times. Only such a creative mode is conducive to the innovative development of art and the sustainable development of harmony between science and technology and humanities.

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