Research Article

The Optimization Function of Computer Image Technology in Processing Oil Painting Creation

Hong Zhu

Department of Teacher Education, Maanshan Teacher's College, Maanshan 243041, China

Correspondence should be addressed to Hong Zhu; 10177@massz.edu.cn

Received 6 January 2022; Revised 20 January 2022; Accepted 26 January 2022; Published 10 March 2022

Academic Editor: Kalidoss Rajakani

Copyright © 2022 Hong Zhu. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

In terms of processing methods, machine learning mainly takes the network as the core and uses the network as a medium to provide services such as computing and delivery. The “cloud” is mainly composed of computers and servers, and the Internet is used to provide network services. With the continuous progress and development of computer technology, digital image processing technology based on machine learning is widely used in production and life. Machine learning uses its own storage and computing capabilities to make the development space of image processing technology broader and effectively realize the rational allocation of resources. This article mainly analyzes the basic knowledge of machine learning, the construction of image processing cloud platforms, and the image fusion system. Then, we aim to optimize the oil painting creation. Through a simple explanation of the basic connotation of images, it is clear that digital image technology and oil painting creation are closely related and complementary. The impact of education and focusing on the application of computer graphics technology to some of the techniques often used in oil painting creation makes the created works more beautiful and artistic and puts forward the application of image processing technology and computer-aided technology in oil painting creation.

1. Introduction

The rapid development of computer technology has accelerated the popularization of digital products based on computer system operating platforms, directly promoted the development of a series of software development technologies, and profoundly affected the field of artistic creation, especially computer graphics technology with its powerful graphics and images. The processing function, which can only be done in the hands of professionals, has been developed to become more powerful and convenient to use. Ordinary people can also use it fluently after learning, which also promotes it to be very fluent [1]. It has quickly become a commonly used auxiliary tool in oil painting creation. Using image processing technology, you can freely adjust pictures as needed, modify ordinary pictures into different forms, and perfectly combine various things that are completely impossible to appear on the same screen, bringing us a lot of meaning and unexpected surprise effects. Computer image processing technology has designed an oil painting generation system. System testing shows that the painting effect of the oil painting generation system is close to the artificial painting effect. In terms of brushstrokes and colors, it focuses on highlighting the characteristics of oil painting, which is highly in line with people’s personalization and uniqueness of oil painting. The drawing method is consistent with the manual drawing method, the brush direction is more reasonable, and the color has been adjusted appropriately, making the overall trend warmer. The two fields of image and art have more points of integration. Traditional painting ideas are experiencing huge challenges. More rich and novel images not only provide artists with a very convenient way of creation but also inspire many more innovative ideas. In terms of research results, my country’s research work on the relationship between oil painting creation and digital technology is still in the initial stage of development. This can also be confirmed from the perspective of research results. In China, when researchers discuss Chinese oil paintings, they mainly conduct research and exploration from the application of images. For example, Jia Yonghong’s point of view in the book "Digital Image Processing" is mainly about the relationship between image
application and creation. From the general trend of the development of world painting art, the status of oil painting creation in the pattern of modern painting art has shown an increasingly obvious trend of marginalization. The artist's attention to contemporary social life and the artistic expression of the human state of mind is constantly surpassing the attention to a certain art category and creative technique, which makes oil painting creation rapidly integrated into other art categories, and is no longer prominent. The problem of "oil painting" [2] is the application of computer graphics technology to oil painting creation organically combines modern technology and traditional painting art. It is not only the last innovation of painting technology history with epoch-making significance but also promotes the development of the concept of painting creation in a diversified direction and greatly expands. In order to improve the artist's thinking, it provides more inspiration for his artistic creation [3]. Therefore, in our research, we aim to investigate the basic knowledge of machine learning, the construction of image processing cloud platforms, and the image fusion system. In addition, we also explore the optimization of oil painting.

2. Image Fusion System of Cloud Platform

The responsibility of the cloud platform-based image fusion system is to provide services related to image fusion. Among them, the machine learning platform of the system is implemented with the help of Eucalyptus software, and a certain software environment needs to be constructed to ensure the operation and development of the software. In addition, from the perspective of the system's functional modules, first, the image preprocessing module in the software can preprocess and enhance the image, the image registration module can register the image, and the image fusion module can complete the image fusion processing. In the overall design of image fusion software, the development of the software needs to be based on WebService rules to ensure that the system can implement network service functions [4]. At the same time, its architecture can be designed as a three-tier model of data layer, functional component layer, and application framework layer. Among them, the data layer is mainly to realize the input and output; the functional component layer is to ensure that the composition of components and controls and the processing of image data can be completed; the application framework layer has the function of promoting the interaction between the user and the system. In addition, from the perspective of the realization of WebService, the image fusion system mainly uses the Java language in the language compilation process. After debugging the application in the system, if there are no loopholes, it can be published as a WebService [5]. During the application process, the user does not need to deal with any situation such as server restart in time.

The oil painting generation system designed by computer image processing technology receives and processes the source image, acquires the sampling points in a raster manner, moves them randomly, and calculates the position gradient of the sampling points and the edge strength of the window through the horizontal and vertical edge operators. It can clarify the stroke direction and radius and take the pixel value of the sample point in the source image as the brush pixel value, so as to realize the oil painting drawing according to the stroke direction, radius, and brush pixel value. Image processing technology is becoming more and more perfect [6]. The invention of this technology has made pictures more and more diversified. Therefore, it has also helped oil painting creation find many novel and creative perspectives and speed up the creation process from a certain angle. The oil painting generation system framework [7] based on computer image processing technology is shown in Figure 1.

The input unit is responsible for inputting images for the oil painting generator. The oil painting generator is responsible for creating an oil painting layer, obtaining parameter control units to realize parameter control, thereby processing the image in blocks, levels, and statistics and drawing the processed image using the oil painting layer as a carrier. Blocking processing, that is, for all pixels of the image, the square needs to be constructed based on this pixel, and the pixel value of the painting is calculated based on the pixel distribution within the square [8]. Carry out classification processing based on the color brightness information, the brightness value range is [0, 255], and at the same time, it is uniformly divided according to the color scale parameters, statistical processing. The parameter control unit is responsible for comprehensive and effective control of the control parameters of the oil painting generator. The output unit is responsible for storing images drawn based on oil painting layers. Currently, the most powerful professional image processing software is PSCS. First of all, the software layer processing technology can provide a great convenience for the plane combination of image data and the image overlay movement. Second, the software has great flexibility in tone adjustment technology, and the overall tone and local detail adjustments are flexible. Third, the software carries the photographic image of the original information processing technology, which can be transferred to the adjustment of the original data such as exposure and color temperature, so as to reduce the spotlight and atmosphere as realistically as possible, and the basic color information that can be done is not affected [9].

Oil painting education is an important source of oil painting creation. It can be said that the widespread use of digital images in oil painting creation has forced the reform of oil painting teaching. Therefore, the use of digital image technology to intervene in oil painting teaching has become an unavoidable and urgent research topic in the current oil painting education circle. In today's information and image society, people's experience of life also shows speed and simplicity. Today's oil painting masters cannot experience life in depth through large amounts of sketching and going to the countryside when creating oil paintings in the non-information image society in the past. The method of collecting creative materials, like technical programs for the teaching of oil painting creation courses, mainly includes photography technology, digital image processing technology, and image output technology based on oil painting materials. The color of oil painting can reflect the
connotation of oil painting creation, and the expression of color is the rich expression of the connotation [10]. Digital image technology promotes the avoidance and teaching of oil painting creation, and at the same time, it avoids the problems caused by the use of digital image technology. Among them, the correct use of software such as PS and CAD is also very helpful to students’ creation.

The auxiliary application of image and digital technology in artistic creation has become a common phenomenon. With the promotion of photography and digital technology, digital imaging equipment has spread to all corners of public life. Coupled with the rapid development of the Internet, a large number of images have occupied a large number of social public space [11]. Contemporary oil painting creators obtain creative resources and inspiration from real life, use images, or adopts digital technology to change the content of the picture. Some domestic creators who use painting techniques express some old photos to the audience in a unique painting language, convey the historical memory hidden behind the old photos to the public, and some display actual characters or installations with subjective intentions. Take pictures and then apply high-tech digital technology to the canvas to create new composition of the picture and give new meaning to the creation. These practical exploration methods are of great significance to the new development of contemporary oil painting creation.

Image processing technology has helped oil painting creation to find many novel and creative perspectives, but it also has certain limitations [12]. If the creative process is too dependent on a technology, it will weaken the ability of the art creator to actively think, and then, art will soon become this. The parasite of technology has completely lost its own charm, which not only cannot help its inheritance and development but pushes it to the end. Society is always advancing, science and technology are also constantly developing, we should not always try to control a new technology, we should use good image materials flexibly, and we should devote more energy to life practice and oil painting creation. In this way, the art of painting can be better developed. Although digital image technology can help painting art complete realistic records and even imitate the effects of oil paintings to a certain extent, it cannot fully demonstrate the creator’s thoughts, emotions, subjective consciousness, and dynamic subtle changes in the picture materials [13]. This is precisely the “soul” of contemporary pastoral oil painting creation. Therefore, at this stage, some scholars and artists still hold qualitative opinions on whether digital photography works belong to modern art creation.

Nowadays, people can use computer image processing technology to easily complete a complete oil painting. Today’s computer oil painting creation is very simple. Traditional oil painting is very difficult. However, it is difficult for today's smart oil paintings to obtain the traditional aesthetic charm. We will find that everyone is very proficient in image processing. Computer oil painting seems to have lost its charm. The computer age is irritable. Few people will calm down and paint a wonderful oil painting. The application of computer image technology in oil painting is often more visual experience [14]. This kind of oil painting is to attract more people’s attention [15]. It can contain many simple computer operations. However, this type of oil painting does not have original connotations and rich aesthetics.

Figures 2 and 3 show the development trend of oil painting. From the perspective of a two-dimensional plane that coordinated upward and downward trends, it is obvious that oil painting creation skills are declining year by year, and art forms such as photography, images, and new media materials are increasing year by year. Fundamentally speaking, as a special ideology, art will inevitably be affected by social and economic development.

From an objective point of view, any new scientific and technological knowledge applied in today’s real society will have a certain relationship in different degrees of reality, and art is no exception. All aspects covered by art often play a guiding role in the application of science and technology; the development results of science and technology will strengthen or weaken the role of art. The mutual penetration and transformation of science, technology, and art show that the application of technology and the development and performance of art are combined and cannot be ignored in the process of using technology.

3. Application of Computer Technology in Oil Painting Creation

The "Internet" era has come, and the development and application of high-quality images and digital technology software have provided abundant materials for traditional oil painting creation. The artistic creation form of oil painting creators gradually gets rid of the constraints of geographical space and dependence on time and space and can obtain material resources faster and more conveniently, which greatly expands the space for artists to express. The fields of Chinese and Western art will surpass traditional limitations from conceptual forms to creative practice, and the forms of expression and content involved in art will inevitably change. In recent years, 3DMAX image technology has appeared again, and it has spread all over the world for a while. It is mainly used in game animation, architectural animation, interior design, film, and television animation, but it soon penetrated into the painting to form a 3D stereoscopic picture. It is the use of painting to create realistic scenes or things under certain light and angles and is almost free from space constraints. Whether it is on large streets and open spaces or on a piece of ordinary paper, the illusion effect is temporarily
Computer graphics technology has brought a lot of inspiration for oil painting creation and aesthetics, and more and more oil painting creators have joined them in the form of computer art creation. Through the organic integration with traditional oil painting creation, the relationship between sketch and picture has been realized. Second, computer-based optimized communication and color rendering can realize the comprehensive utilization, editing, and resetting of image resources. In addition, through photographic materials or other related materials directly into the computer technology renderings, the creation of resources is richer, so as to better serve the oil painting creation process. CorelDRAW is a professional graphic design software that integrates multiple functions such as website production, page design, web animation, and vector animation. It provides various modes of color schemes and color matching management methods. It can achieve screen display. The printing and printing colors are exactly the same [18].

By comparing and analyzing the image rendering method designed by Herzmann and the oil painting method based on computer image processing technology designed in this study, the practical effect of the oil painting generation system is verified.

It can be seen from Figures 4 and 5 that the image drawn by the Herzmann method pays attention to color similarity, and to a certain extent, the influence of the overall structure of the image on the whole picture is ignored. In the process of oil painting, the sense of direction of the brushstrokes is unbalanced, giving people a sense of confusion as a whole. Moreover, the tones are not rich and diversified and too monotonous.

Drawing is based on the oil painting generation method based on computer image processing technology designed in this study, and the results are shown in Figure 6. Through the comparative analysis, it can be seen that the painting effect of the oil painting generation method designed in this article is closer to the artificial painting effect. In terms of brushstroke and color, it focuses on highlighting the characteristics of oil painting, which is highly in line with people’s individual and unique needs for oil painting; The drawing method is consistent with the manual drawing method, the brush direction is more reasonable, and the color is adjusted appropriately, making the overall color warmer [19].

4. Results

Computer image processing technology can make the color of the oil painting image more real, easy to store, and transport for a long time. With the continuous development of computer software functions in the direction of specialization and diversification, oil painting art creators can quickly and effectively modify their works at any time. Computer image processing technology enables artists to easily achieve very complex composite effects and can minimize the error between the effects in the flat-panel production process and the effects after printing. Computer retention makes it easy to change any graphic image or the entire image. In addition, computer image processing technology has a tendency to try different methods on the color matching and structure of works to obtain different
kinds of works effects for comparison, and more conducive to the selection of the final artistic creation work, computer image processing technology has proposed more pen categories for artistic creation, and there are many strokes for creators to choose at will. It cannot only extract digital, digital imaging, and scanned images quickly and efficiently. Using computer image processing technology in oil paintings, you can easily extract scanned images of vector paintings and three-dimensional paintings, so that the oil paintings are truly rich in color and show amazing artistic effects. Use computer image processing technology to create oil paintings to achieve different image processing effects. At the level of image material arrangement, by sharpening or softening the image material, the quality of the image can be restored, and the artistic effect can be effectively processed. Computer image recognition technology is being promoted by the wave of science and technology. At the same time, it also receives urgent pressure from human production and life. The image processing technology is used everywhere at work and life. Not only should the text and other information be collected and processed but also various factors in the image should be identified, analyzed, and compared. When processing such as sorting and compression, the image data must be continuously converted by multimedia. In fact, this process can only be completed by humans, and now, it is necessary to replace humans with computational image recognition intelligent technology. At the color mode level, the digital art color system is used to achieve a variety of color mixing [20]. It can make the image present a variety of different texture painting effects, so as to realize the fine expression of oil painting element composition and color scale. In the whole creation process, the profound essence of traditional oil painting art and modern technology are organically integrated, which enrich the connotation of computer oil painting creation.

Therefore, the development direction of computer image recognition technology must be a breakthrough towards high speed and standardization. Contemporary Chinese oil painting creators should make full use of the advantages of computer imaging technology to develop. In the process of computer image recognition, both two-dimensional scanning and three-dimensional recognitions are used. The processing of images requires the computer’s CPU function to be continuously powerful and deepened. Because of the wide range of applications, the computer image recognition function must pay attention to detailed information processing technology and provide the highest definition of pictures according to the needs of human beings. This is the focus of the computational image recognition system, so the computer image recognition system must make breakthroughs in the direction of multidimensional and technological development.

5. Conclusion

We have adopted significant computer image processing technology based on machine learning in oil painting creation. It changed the conceptual level of oil painting art creation and the creator’s emotional integration and personality expression level, which greatly promoted the development of oil painting creation concepts and methods. The system and database can intelligently dispose of the image during processing when using the computer for image data processing. It can judge the image by itself and prompt the user whether to adjust the image accurately and clearly after the user’s permission. It can automatically process the image with the most enhanced effect. However, there are still some limitations in our research. We still need to pay more efforts to our research and conduct more detailed analysis.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author upon request.
Conflicts of Interest

The author declares that there are no conflicts of interest.

Acknowledgments

This research was partially supported by Anhui Provincial Department of Education under the project of “Support Plan for Outstanding Young Talents in Colleges and Universities of Anhui Province” (gxxyqZD2017137) and the Quality Engineering Project of Maanshan Teachers College (2018xjjxtd01).

References

[1] J. Liu and X. Qian, “Drawing program of oil painting which based upon computer,” in Proceedings of the 2010 2nd International Workshop on Database Technology and Applications, IEEE, Wuhan, China, November 2010.
[2] F. Liu, “Research on oil painting creation based on computer technology,” Journal of Physics Conference Series, vol. 1915, no. 2, Article ID 022005, 2021.
[3] J. Ren, “The influence of new media art on chinese contemporary oil painting,” Brandweek, vol. 10, p. 78, 2013.
[4] X. Jia, “Research on the influence of computer technology on oil painting creation in the new era,” Journal of Physics Conference Series, vol. 1915, no. 4, Article ID 042062, 2021.
[5] N. Gao and L. Fu, “Application of 3D image technology in the 3-dimensional reconstruction of impressionist oil painting art,” International Conference on Machine Learning and Big Data Analytics for IoT Security and Privacy, Springer, Cham, Switzerland, 2021.
[6] Yu. Zhang, “Research on digital image technology in oil painting image processing,” IOP Conference Series Materials Science and Engineering, vol. 750, no. 1, 2020.
[7] W. Gaihua, Z. Tianlun, D. Yingying, L. Jinsheng, and C. Lei, “A serial-parallel self-attention network joint with multi-scale dilated convolution,” IEEE Access, vol. 9, no. 5, pp. 71909–71919, 2021.
[8] Z. Ding, “The application of digital image technology in the oil painting technique teaching,” in Proceedings of the 2nd International Conference on Education Technology, Management and Humanities Science, Beijing, China, January 2016.
[9] V. Zinchenko, G. Kondratenko, G. Sidenko, and Y. Kondratenko, “Computer vision in control and optimization of road traffic,” in Proceedings of the IEEE Third International Conference on Data Stream Mining & Processing (DSMP), IEEE, Lviv, Ukraine, August 2020.
[10] S. Fu’s, Based on the Association Memory Network. International Smart City and System Engineering Conference’s Realistic Oil Painting Style Evaluation Model, IEEE, Piscataway, NJ, USA, 2017.
[11] J. Liu, J. Wu, L. Sun, and H. Zhu, “Image data model optimization method based on cloud computing,” Journal of Cloud Computing, vol. 9, pp. 1–10, 2020.
[12] J. Peng, “Oil painting material collection system based on artificial intelligence,” Journal of Physics Conference Series, vol. 1852, no. 2, Article ID 022029, 2021.
[13] G. Yang, “Imagery and abstraction trend of Chinese contemporary oil painting,” Linguistics and Culture Review, vol. 5, no. S2, pp. 454–471, 2021.
[14] J. Yao, L. Wang, K. Liu et al., “Evaluation of electrical characteristics of biological tissue with electrical impedance spectroscopy,” Electrophoresis, vol. 41, no. 16-17, pp. 1425–1432, 2020.
[15] Y. Liu, “Improved generative confrontation network and its application in image oil painting style transfer,” Image and Vision Computing, vol. 105, no. 2, Article ID 104087, 2020.
[16] P. Yang, “Study on the relationship between computer art design and art,” China Off Campus Education, vol. 10, no. 36, pp. 102–104, 2015.
[17] Y. Liu, “Improved generative adversarial network and its application in image oil painting style transfer,” Image and Vision Computing, vol. 105, Article ID 104087, 2020.
[18] J. Liu, “Practical application of image processing technology,” China Public Safety, vol. 8, pp. 116–118, 2017.
[19] Q. Zhai, “Discussion on the value of Chinese oil painting creation from the perspective of regional culture,” Fine Arts Observation, no. 10, pp. 140–141, 2019, https://kns.cnki.net/kcms/detail/detail.aspx?dbcode=CJFD&dbname=CJFDLAST2019&filename=MSGC201910053&uniplatform=NZKPT&v=jGPACcS3eh0Cj9gWa'T-oFrhDYc0L_CJ86xmd5oZzZyxKDXHUMiNvrlXU2zbsttK.
[20] F. Nie, “Analysis of photoshop’s cutout technology,” Electronic Technology and Software Engineering, vol. 18, p. 74, 2017.