



Analysis and Research on the Development of Illustration Design Under the Background of Data Analysis

Hui Wang^(✉)

Gongqing College of Nanchang University, Nanchang 332020, China

Abstract. Generally speaking, in the field of art design, music and picture are two different forms of art design. It is very difficult to transform them. But with the rapid development of artificial intelligence in recent years, it is easy to realize the transformation of the two. Not only that, because of the wide application of artificial intelligence technology, the field of art design and creation is also assisted by artificial intelligence. Designers should learn to combine artificial intelligence technology in the process of learning design creative programming. This paper mainly discusses the research and development of art design under the background of artificial intelligence. By introducing the concept of illustration, the development of illustration and the forms of illustration, this paper briefly analyzes the changes in the performance style of illustration in different periods, and further analyzes the characteristics of the performance style of illustration under the background of visual culture era, which helps to improve the artistic charm and practical value of illustration design.

Keywords: Art design · Artificial intelligence · Scheme

1 Introduction

AI has been widely concerned after alpha go defeated Li Shishi. After that, AI has gradually entered our life and work, and some mechanized work will be gradually replaced by AI. At the same time, the relationship between the field of art creation and artificial intelligence also began to receive attention, people began to seek new development of art design creation under the background of artificial intelligence [1].

“The function of illustration to the content of the text is to supplement explanation or artistic appreciation, and to insert it in the middle of the book by printing it in the middle of the text or in the form of inserts.” This is the definition of illustration in Cihai. In the traditional sense, as the visual explanation and supplement of the text content, illustration plays a more important role in the visual expression of the text narrative content. Therefore, the most basic meaning of illustration is a kind of picture inserted in the middle of the page to express the meaning of the content of the article. Images are indispensable in human daily life. As early as in ancient China, people had a deep understanding of the meaning of “casting tripod like objects to make people know God”

(Zuo Zhuan); at the same time, the proverb “a picture is better than a thousand words” was also widely spread in the West. “The effect of painting on illiteracy is the same as that of writing on literate people.” This is Archbishop Gregory’s exposition of the role of painting. After the industrial revolution, human civilization has developed to a new height. At the same time, the proportion of illiteracy in the social population has also dropped to a very low level. However, the reality is that people do not reduce their dependence on images because of the improvement of literacy. People’s demand for images is more intense due to the development of new image technology.

Commodity image is the expansion of animal personification in the field of commodity, and the personified commodity gives people a sense of intimacy. Personalized modeling, refreshing feeling, so as to deepen people’s direct impression of goods.

In terms of the concept of commodity personification, it can be roughly divided into two categories.

The first type is the complete personification, that is, exaggerating the commodity, using the commodity’s own characteristics and modeling structure to perform personification.

The second type is semi personification, that is, adding hands, feet and heads as the characteristic elements of personification.

The above two personification molding techniques make the goods full of humanity and personalization. Through the form of animation, emphasis on the characteristics of goods, its action, language and goods directly linked, publicity effect is more obvious.

Illustrators often draw illustrations for graphic designers or directly for magazines, newspapers and other media. They are usually professional illustrators or free artists, like photographers, with their own themes and painting styles. Being sensitive and eager to new forms and tools, many of them began to use computer graphic design tools to create illustrations. The function of computer graphics software makes their creative ability get greater play, whether simple or complex, whether traditional media effects, such as oil painting, watercolor, printmaking style or endless new changes and new interests of digital graphics, can be more convenient and faster. Digital photography is the latest development of photography. Photographers use digital cameras or scanners to scan traditional positive films into the computer, then adjust, combine and create new visual images on the computer screen, and finally output positive or negative films through the film recorder. This new photography technology has completely changed the creative concept of optical imaging in photography, and takes digital graphics processing as the core, also known as “photography without darkroom”. It blurs the boundaries between photographers, illustrators and graphic designers. Nowadays, as long as you have the ability, you can complete these three kinds of work on the same computer.

2 Artistic Expression of Artificial Intelligence

The so-called art is actually the embodiment of human thought, is to express our sense of experience through various art forms. Art is not only a physical form of expression, but also a transmission of people’s thoughts and spirit. Artists pass their spiritual world to the world through art forms, so that we can understand the unknown fields. With the advent of the information age, art should also change with the change of the times. We can’t

separate the connection between art creation and the times. Therefore, it is an important task of current art creation to connect art with science and technology. Nowadays, art design needs different space and materials. With the continuous development and popularization of artificial intelligence, the field of art design has also been greatly affected. Therefore, in this context, we should seize the opportunity to realize the combination of art and artificial intelligence, and promote the new development of art design [2].

Usually, the title page painting of King Kong Prajna Sutra in Tang Dynasty is the first illustration work in China. This is also the first illustration found in books. Later, the development of illustration in China was mostly influenced by it. Although scholars have found that there are similar images in the silk books before the Tang Dynasty, there are obvious differences between the books that people usually say and the ancient silk books. Then we can get the characteristics of illustration creation in the era of non visual culture:

First, the carrier of illustration creation is single. It only appears in the form of illustrations in paper books, excluding the form of bamboo and silk books. The reason why they are called “illustrations” is that these pictures appear in the book, and the book is the main body. When we only consider pictures and ignore books, pictures are called “illustrations”. At this time, although the picture is presented in the book and serves the book, it is the subject. Because we need to consider both the nature and the source of “painting”, we call it “illustration”.

Second, illustration creation appears in the form of woodcut. Movable type printing not only facilitates the typesetting of words, but also facilitates the flexible typesetting of all kinds of pictures. Since then, the presentation of illustration in books has become more flexible. The presentation of illustration has also developed from the first page to the whole book, and experienced the change from the presentation of the whole page to the more flexible and flexible. Illustration in books is also more diversified.

Gaussian smoothing. In order to avoid the influence of noise in the image on the effectiveness of edge detection, it is necessary to filter the image. Gaussian blur is a way to smooth the image. Convolution of the image with Gaussian filter can filter out the noise details in the image. Gauss blur is to assign different weights according to the distance of pixels in the neighborhood, and the distribution mode is normal distribution [3]. According to the two-dimensional Gaussian function to calculate the weight of each point around, the calculation formula is as follows:

$$G(x, y) = \frac{1}{2\pi\sigma^2} e^{-(x^2+y^2)/2\sigma^2} \quad (1)$$

The gradient intensity and direction of all pixels in the image are calculated. The edge points of the image can point to different directions. Calculating the direction of each pixel can find out the related pixels and combine them into a contour. The amplitude g and direction α of the gradient can be changed.

$$G = \sqrt{G_x^2 + G_y^2} \quad (2)$$

$$\alpha = \arctan(G_y, G_x) \quad (3)$$

According to the direction of gradient, the pixels whose amplitude is not the maximum are suppressed. This step is to refine the coarse edges calculated by SOBE operator

in the previous step. The outline with thick edge is fuzzy. Here we think that only one pixel is the best edge width.

3 Practical Application of Artificial Intelligence in Art

Artificial intelligence has more and more influence on the field of art. Through artificial intelligence, artists can more completely express their thinking. For example, deep learning algorithm can generate paintings. We can also use artificial intelligence to create music and poetry, which effectively link art design and creation with artificial intelligence. Specific applications are as follows: (1) we can use artificial intelligence to create posters. For example, Alibaba's "Luban" artificial intelligence system can make posters, which not only takes a short time, but also has good quality, which effectively reduces the work pressure of Taobao designers; (2) artificial intelligence technology can help designers select materials. For example, Sensei system, which can store all kinds of pictures and videos, can select appropriate materials in the system when designers carry out art design. Sensei system can analyze and screen the materials stored in the system according to the requirements of designers, and users only need to select one key to generate the scheme that meets the requirements; (3) artificial intelligence can generate architectural design scheme. Xkool is a platform for building users. This platform is easy to operate. Users only need to input design requirements and parameters, and the platform can generate multiple schemes for customers to choose according to their design requirements. This process can be completed in a few seconds. This fully proves that artificial intelligence can greatly shorten the design time and reduce the work pressure of designers; (4) artificial intelligence can provide color matching schemes for art design. George Hastings system can automatically generate color matching schemes according to the colors selected by users, which not only takes a short time, but also realizes high-precision color combination and improves the efficiency of design work; (5) Artificial intelligence can also help people to design clothes. In 2017, Amazon launched the artificial intelligence algorithm for designing clothes, which can generate the design drawings of clothes according to the pictures provided by users. The system can also analyze the market big data, predict the future trend, and design new clothes in line with the trend [4].

In the development of printing technology, CI technology, photography and other new media technologies, images are gradually integrated into all aspects of people's lives. Jin Yuanpu once said: "there is a close relationship between the great changes of modern society and the emergence and development of the era of visual culture". From the perspective of the mode of communication, electronic media and digital media have gradually replaced the original print media, which has produced many phenomena of the visual culture era in the real society. In the past, the main way to acquire knowledge was words. The appearance of visual images has changed our way of life and thinking. At first, images were spread through computers. There is no doubt that the emergence of a wealth of electronic products (tablet computers, MP4, etc.) in recent years is also conducive to the spread of images. In the era of visual culture, in order to adapt to the requirements of the development of the times, people also need to constantly change and develop a new way of image communication which is different from the traditional way.

Artificial intelligence technology can promote the development of art design, not only in the application of design, but also in the application of art education. Teachers can use artificial intelligence technology to teach students art and design knowledge faster and better, and then students can use more time to practice, accumulate more design experience and lay a solid foundation for their future work. At present, many schools will use computer aided instruction system for auxiliary teaching, through the multimedia class for students to intuitively display art knowledge. For example, teachers can use virtual technology to create a good learning environment for students, and use 3D printing technology to show students' thinking, so as to improve students' interest and enthusiasm in learning art and design. However, students must actively participate in the teacher's teaching, so that the teacher can carry out targeted guidance according to the students' personal learning situation. It can be seen that the application of artificial intelligence to art education can cultivate students' divergent thinking ability, help them develop their imagination and better complete the learning content.

Illustration creation has changed a lot under the background of visual culture era. In the era of visual culture, people have a deeper understanding of the definition and extension of the concept of illustration, the carrier of illustration, the way of creation and the function and application of illustration. With the development of new technology, illustration is no longer limited to printing. The development of multimedia technology, network technology and digital technology has enriched the presentation and dissemination of illustration. The creation way of illustration also changes with the change of presentation way and communication way of illustration. For example, through the artist's direct or indirect woodcut creation printed on books, this is the traditional way of illustration creation. However, illustration creation has become more diverse in the era of visual culture.

4 Conclusion

Artificial intelligence has a great role in promoting the development of art design. Its application in art design can not only reduce the work pressure of designers, but also shorten their working hours, and promote the good development of art education. However, works of art are always created based on human subjective thoughts and feelings. Therefore, no matter what achievements artificial intelligence has made in art design, there is one thing that can not be changed. Artificial intelligence is defined by human beings and is a tool to assist the development of human art design. In order to create shocking works, designers' emotional injection is indispensable.

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