

Application of Artificial Intelligence Technologies in Visual Communication Design

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Abstract: In recent years, the artificial intelligence technologies have developed rapidly, gradually infiltrated various fields, empowered all walks of life, and promoted the transformation and upgrading of technologies in various fields. Among them, the field of visual communication design, which mainly transmits visual symbol information, is developing in a more intelligent and diversified direction with the support of artificial intelligence technologies. This paper mainly discusses the application status and practical impact of artificial intelligence technologies in the field of visual communication design, so as to help people better understand and grasp the relationship and development between the two, promote the full and in-depth integration of the two, and improve the innovation and optimization development of visual communication design, which can bring people more beautiful design works.

Keywords: Visual Communication Design; Artificial Intelligence Technologies

1. Introduction

With the continuous improvement of people's aesthetic level, visual communication design not only needs to have strong imagination and artistic creativity, but also should be in line with modern technologies. In the field of visual communication design, more digital and intelligent scientific concepts need to be applied, and multi-field and interdisciplinary collaboration need to be achieved, so that the visual communication design can better meet the modern aesthetic needs, promote the design concept and method to follow the pace of the times, keep pace with the times, and then continue to get optimization and improvement.

The artificial intelligence is an interdisciplinary subject involving philosophy, computer science, linguistics, psychology and other disciplines. Based on and supported by big data, the artificial

intelligence is a computer system including information technology, computer technology and other science and technologies. Compared with previous technical means, the artificial intelligence has excellent performance in stability, operation efficiency, data inclusiveness and other aspects.

Under the guidance of specific goals and objectives, visual communication design is a process in which information communicators transmit information to the public and have an impact on them through the carrier of visual symbols. It has two characteristics, which are artistic sensibility and scientific rationality. At the same time, in the context of the rapid development of information technology, the innovative development of visual communication emphasizes and highlights the intelligent and collaborative design, begins to gradually break the shackles of the original design mode, and relies on and utilizes new technologies and media to achieve continuous innovation and breakthrough, so as to form diversified design methods.

2. Types of Artificial Intelligence Technologies

2.1 Image Recognition and Classification Technology

Image recognition and classification technology can help designers quickly identify a large number of visual materials, and grasp the image library, illustrations and icons, in order to further improve the design efficiency, reduce the difficulty of the designers' job, and provide more material support for them. For example, in the process of sports brand design, with the help of big data analysis and expert system, a series of related visual elements can be directly provided to the designers. This image, which has been processed and classified, is convenient for the designers to directly use, and the designers only needs to make corresponding adjustments and decisions on the intelligent calculation results to complete the design task^[1].

2.2 Virtual Reality and Augmented Reality Technologies

The combination of virtual reality and augmented reality artificial intelligence technologies makes it possible for visual designers to create immersive user interfaces and design works, which can combine the static vision, dynamic vision, stereoscopic vision and the plane vision, and promote the transformation of single media to multimedia, so as to build an immersive visual framework and create new visual experiences and interaction modes.

2.3 Visual Design Tools

Visual design tools include automatic design process, optimization tools and automatic generation of design elements, etc. These technologies and tools can use data visualization to present data information to help designers obtain accurate information by intuitive graphical methods, so as to speed up the design process, save design time and energies, and improve the design quality^[2].

3. Application of Artificial Intelligence Technologies in Visual Communication Design

3.1 The Application of Artificial Intelligence Technologies in Font Design

The colors, texts and pictures are the three main components of graphic design, and the important carriers of information. Therefore, the introduction of artificial intelligence technologies into font design can empower Chinese font design, make famous characters and Chinese character styles more visual, digital and changeable, and make them have more design possibilities. For example, Wang Xiaohong combines the generative adversarial network with the variational self-coding to propose a Chinese calligraphy font image generation model, which includes font generation framework and emotion extraction framework. Firstly, the emotion extraction framework converts the color space to the calligraphy image in Lab mode to extract the style features. Secondly, the font generation framework extracts the font shape feature. Then, after the comprehensive processing and joint training of the shape and style characteristics of Chinese characters, a calligraphy font with good visual effect and significant style can be formed.

This technology is suitable for some Chinese character patterns with relatively regular structures, but it still needs to be further optimized for the application of distinctive characters such as the script created by Shu Tong and the cursive script^[3].

3.2 The Application of Artificial Intelligence Technologies in Logo Design

The logo design originates from the totem in ancient times, which is an important bearing and embodiment of the ancients' strong respect for gods and nature. At present, the logo can be seen everywhere and is widely used in various fields, which has become a visual symbol of brand confirmation, and had aesthetic, identification and functional characteristics. With the support of artificial intelligence technologies, the bearing media of the logo has gradually developed in the direction of digitization, and the logo design mode has also turned to the intelligent design. For example, based on the perspective of reception aesthetics, Tian Nannan uses artificial intelligence technologies to form an innovative way of intelligent logo image design. By creating the acceptance logo database "JN-Logo", Tian Nannan forms an intelligent analysis method of acceptance style "DTCluster", and comes up with the acceptance generation method of intelligent coloring of logo sketches. This method is mainly to let the machine learn the characteristics of the logo image, build the corresponding database for intelligent analysis, and then output the corresponding images. In this mode, the intelligent generation of the logo image is more efficient^[4].

3.3 The Application of Artificial Intelligence Technologies in Interaction Design

Under the background of the digital new media era, the information communication shows strong interactivity. Therefore, the interaction design has become a very important part of visual communication design. With the application of artificial intelligence technologies, people's cognitive logic and perception of interaction have undergone great changes, and presentation modes of cognitive mental model, interaction design process and method, and interactive interface have also undergone subversive changes. Designers need to use new interactive technologies and new media tools to construct the bridge between audience and

artistic design works, and make the two interact with each other well. For example, Fan Ling and other scholars designed a human-machine interaction intelligent system by using an interactive, intelligent and immersive model. Taking the Jinshan farmer painting as an example, they firstly formed a corresponding derivative generation algorithm through machine learning, so that the audience can draw basic sketches on the human-machine interaction interface, and then the system can automatically draw the Jinshan farmer painting works. It brings an immersive and personalized art experience to the audience and inspires the enthusiasm and initiative of the public to participate in art design and art life^[5]. Another example is the application of artificial intelligence technologies in the visual design of Chinese character elements. Through the introduction of advanced technologies such as machine vision and natural language processing, the multidimensional innovation of Chinese characters in user experience and user interface can be further stimulated, so that Chinese character elements can be applied intelligently and flexibly, and the layout and style of Chinese character elements can be dynamically adjusted under the free interactive feedback with users, so as to present excellent visual performance and make the design more humane. Based on the user's unique reading habits and aesthetics, this method can adjust the Chinese character font, size and color in real time to accurately connect with user needs and improve their satisfaction.

3.4 The Application of Artificial Intelligence technologies in Illustration Design

The illustration is also an important part of visual communication design, which is the embodiment and interest of text content and can bring people a strong visual impact. Artificial intelligence technologies can simplify the workflow of designers, so that they can have more energies to creatively conceive and design, and think and analyze problems from a broader perspective. The combination of ChatGPT with Midjourney, an AI drawing tool, can make the illustration design, from the script creation to the content drawing, more fast and efficient. Firstly, after logging in to the ChatGPT and inputting the corresponding creation requirements, the system can feedback the corresponding suggestions and answers, guide and instruct the users to make improvements. Thus, the story

content can be more logical and orderly, and the script creation content can be richer. Secondly, after entering the “/imagine+ descriptive prompt words” matching the script in the Midjourney channel bar, the corresponding illustration pictures can be obtained. The recently popular AI painting is an upgrade on the original technology, and only requires users to input simple words to get the final illustration works.

4. The Impact of Artificial Intelligence Technologies on Visual Communication Design

4.1 Greatly Improve Work Efficiency

The strong independent learning ability, computing power, stability and other characteristics can make artificial intelligence technologies maintain the normal operation working state for a long time, so as to make up for the individual fatigue and shortcomings during the manual work, and then improve the efficiency and quality of design on the basis of reducing the cost of visual communication design for enterprises. Moreover, artificial intelligence technologies have a huge database, excellent memory, and is not easily affected by subjective factors. Therefore, when analyzing design works, the inherent thinking and stereotypes of artificial design and comparison can be effectively reduced, and the works can receive more scientific and comprehensive evaluations, so that the shortcomings of the finished products can be identified, and the designers can be guided to generate new logic to make targeted improvements to the work and finally find out the best items, so as to improve the quality of visual communication design works.

4.2 The Interactive Dissemination of Information

With the support of digital multimedia and artificial intelligence, the way of information dissemination has changed from the original point-to-point and point-to-side to interactive dissemination, and a new cultural situation of human social communication has formed. In the context of interactive dissemination, the visual communication design emphasizes the participation of the viewers, which effectively reduces the aesthetic distance between the visual form and the visual viewer. It guides the viewers to get in close contact with itself with the feature

of game, and brings the viewers a more realistic and rich viewing experience. Artificial intelligence technologies, including virtual reality and augmented reality, can promote the diversified performance of visual communication. For example, the augmented reality technology (AR) can be applied to electronic display screens, and provide audience with a brand new sensory experience through its novel and unique form of expression, interesting interactive experience. The interactive screen design in Fangtai multimedia digital experience is a typical example of multi-sensory and interactive dissemination. In the Fangtai Cixi Multimedia Digital Experience Center, there are three large screens: user experience, corporate culture and interactive photography. The designer uses the process of a tree from root to sprout to compare the growth track of Fangtai, and presents the complete journey of Fangtai product use experience from an individual perspective. Guests can leave their presence in the photo area and present it on the photo wall in real time, so that people can get comprehensive interactive experience with multiple senses coexisting^[6].

4.3 Promote the Transformation of Designers' Thinking

Artificial intelligence technologies can also reverse promote the thinking innovation and transformation of visual communication designers. Google developed the AlphaGd (Alpha Graphic design) in 2016. This artificial intelligence program stores millions of graphic design project cases around the world, which can be used for graphic design, and can complete the task of compiling 300 pages of pictures in five minutes, so as to push design forms that conform to the general aesthetic of the modern market to users. These artificial intelligence technologies have the output efficiency that human designers can hardly match, but they mainly imitate existing cases and have weak independent innovation ability. Therefore, under the continuous innovation and development of technology, designers should constantly promote the development of their own creative thinking, so as to improve the individuation and innovation of visual communication design works.

4.4 Intelligent Teaching of Visual Communication Design

In the context of artificial intelligence, the visual communication design education has also undergone corresponding changes. The visual communication design major in colleges and universities is constantly innovating in teaching objectives and methods, which makes the teaching content more interactive and innovative, and makes the integration between various disciplines more closer. The process of interweaving, merging and colliding between the visual communication design major and related majors will produce wonderful reactions and spark of creativity, which can further expand and extend the boundary of visual communication design. For example, more cultural and social factors are integrated in the design process to give the work special social significance. In the reform of teaching methods, for example, teachers can use VR technology to restore realistic situations, so that students can immerse them in the exhibition of the works of the art master Van Gogh, and then students can be led to perceive the characteristics, creation details and artistic emotions of art works in a close distance in this virtual digital exhibition. From the perspective of student learning, students can achieve more personalized and high-quality learning. Artificial intelligence technologies can form personalized learning plans and programs based on different students' interests, hobbies, habits and learning needs, and provide students with rich teaching resources and aids to achieve individualized teaching^[7].

5. The Development Dilemma and Future Prospect of Visual Communication Design in the Context of Artificial Intelligence

In the context of artificial intelligence, the visual communication design may face the following difficulties. First, it can not grasp the relationship between technology and design. Some designers overly rely on modern information technology and artificial intelligence means, which results in the degradation of individual design ability, the shallow content of works, and the lack of adequate and profound thinking, so as to cause serious formatting of output works. Second, there may be legal and intellectual property related issues in the application of artificial intelligence in visual communication design. Some people will use AI technology to tamper with, imitate and copy design works at will in the network platform, which may infringe on the

personal interests of designers. Third, although artificial intelligence can generate corresponding design schemes and works based on machine learning algorithms, it has certain limitations in creativity and learning abilities. It is weak in the sensitivity of art perception and the ability to capture art, and it is difficult to produce works with deep meanings and deep emotions. Therefore, it is necessary for designers to fully mobilize their own artistic judgment, give play to their professional knowledge, spark inspiration by technical empowerment, and breed more distinctive artistic works.

In the future, the design mode of cooperation between humans and machines will continue to mature and improve, which means that the artificial intelligence will assume more and more work, and designers will also tend to shift to the identity of decision makers and supervisors. At the same time, with the development of speech recognition technology and transfer learning technology, artificial intelligence can have and master more design methods, and accurately obtain users' design themes and intentions through the barrier-free exchange and communication between humans and machines, so that the design works can be extended in multiple dimensions and more excellent works with visual tension, visual expression, distinct personality and rich connotation can be produced^[8]. Of course, the development trend of visual communication design in the context of artificial intelligence also requires designers to constantly learn and update design concepts and improve their skills to better adapt to the requirements of the information age.

6. Conclusion

Under the background of information and digital age, the visual communication design enabled by artificial intelligence has become an inevitable trend and development direction of art design. While bringing convenience to visual communication designers and greatly improving work efficiency, it also has certain risks.

Therefore, in the process of applying artificial intelligence technology, it is necessary to grasp the scale between people and technology, and not only value the role of modern technology, but also emphasize the play of individual subjective initiative, so that the science and art can be well integrated and go hand in hand.

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