



Analysis of AIGC and Visual Communication Design Fusion Strategies

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Abstract

This article conducts an in-depth exploration of the integration of AIGC (Artificial Intelligence Generated Content) and visual communication design. Firstly, it provides a detailed analysis of the technical characteristics of AIGC, including the core technical frameworks represented by the Generative Adversarial Network (GAN) and diffusion models, as well as its powerful creative generation ability demonstrated by the closed-loop mechanism based on "learning - generation - iteration". At the same time, it points out the pain points existing in visual communication design in terms of labor costs, style innovation, design efficiency, etc., and expounds on the complementarity between the two. Then, it delves into the necessity of the integration of the two. AIGC can not only significantly shorten the design cycle and improve design efficiency through automated processes, but also stimulate designers' innovative thinking and realize an innovative mode of "human-machine collaboration". Moreover, it performs excellently in meeting users' personalized needs, and can generate personalized design content according to user portraits and usage scenarios. Finally, through practical cases, the remarkable advantages of AIGC in practical scenarios such as the intelligent construction of brand visual systems and the design of dynamic and immersive media are demonstrated.

Keywords

AIGC; Visual Communication Design; Generative Artificial Intelligence; Design Innovation; Technology Integration; Interdisciplinary Application

Driven by the dual waves of digitalization and intelligence, Artificial Intelligence-Generated Content (AIGC) is gradually reshaping the paradigm of traditional visual communication design. Based on deep-learning and natural-language-processing technologies, AIGC can achieve powerful functions such as image generation, style transfer, and dynamic interaction, greatly expanding the creative boundaries of designers. However, in the process of their integration, there are still many challenges such as technical adaptability, copyright disputes, and design dominance (Guo, Y., 2024). Through a systematic analysis of the interaction paths between AIGC and visual communication design, this paper proposes efficient and sustainable integration strategies to promote the intelligent transformation and value upgrading of the design field.

1. Complementary Nature Between the Technical Characteristics of AIGC and Visual Communication Design

1.1 The Core Technical Framework of AIGC

The core technologies of generative artificial intelligence mainly rely on large-scale pre-trained models, among which Generative Adversarial Networks (GANs) and diffusion models are typical representatives. A Generative Adversarial

Network, through the game-adversarial process between a generator and a discriminator, continuously optimizes the generated results, enabling it to generate highly realistic images, videos, and other content. For example, in an image-generation task, the generator attempts to generate images, while the discriminator tries to distinguish between the generated images and real ones. The two compete and promote each other, continuously improving the quality of the generated images. A diffusion model, on the other hand, is based on the principles of forward diffusion and reverse denoising, gradually restoring clear images from noise. It can generate diverse and high-quality images and has a strong ability to understand and control semantics during the generation process (Tang, N. & Li, T., 2024).

Under the closed-loop mechanism of "learning-generation-iteration", AIGC demonstrates powerful creative-generation capabilities. Taking a text description of "the future city skyline" as an example, AIGC can deeply understand various elements in the text, such as architectural styles, color combinations, and spatial layouts. Then, through the semantic and visual patterns established by learning from massive image data, it can quickly generate images of a futuristic city skyline. These images are not only rich in details, such as the material texture and lighting effects on the building surface, but also can showcase unique design concepts. Moreover, they can be quickly adapted to different visual languages, such as realistic style, cartoon style, and sci-fi style, according to different design requirements.

1.2 The Pain Points in the Requirements of Visual Communication Design

In the fast-paced market environment of today, the traditional design model has exposed numerous limitations. In terms of labor costs, when designers carry out design work, they need to invest a great deal of time and energy in the drawing and collection of basic materials, as well as the initial conceptualization of design plans. Take brand VI design as an example. The traditional process requires designers to first deeply understand the brand concept, target audience, and industry characteristics. Then, they hand-draw basic graphics in various styles, widely collect relevant materials, and repeatedly integrate and adjust them. This process usually takes 3 to 6 months. However, with the help of AIGC, after designers input key information, AIGC can quickly generate basic graphics and materials in various styles, and the entire process can be shortened to 1-2 weeks, significantly saving labor costs.

At the same time, the phenomenon of style convergence is quite serious in the traditional design model. Due to the limitations of designers' design thinking by their own experience and reference cases, many design works lack uniqueness and innovation in style and form of expression. With limited design thinking and reference cases, designers often find it difficult to break through the traditional design framework, resulting in a serious homogenization of design works in the market. For example, in the design of e-commerce product posters, many designers have limited reference cases, leading to a large number of posters having similar compositions, color combinations, and expression techniques, which are difficult to attract consumers' attention.

2. The Necessity of the Integration Between AIGC and Visual Communication Design

2.1 The Dual Goals of Efficiency Improvement and Innovation Empowerment

AIGC can greatly shorten the design cycle and significantly improve design efficiency through an automated process. Taking tools like MidJourney as an example, designers only need to input simple keywords, such as "modern minimalist style home space design", and it can generate multiple home space design plans with different layouts and decoration styles in a short time. These plans cover the design from the overall space planning to the detailed decorative elements, providing designers with rich creative inspiration. Designers can then free themselves from tedious basic design work and focus on strategy formulation and emotional expression. Designers can screen and optimize these drafts according to the specific needs of the project and the characteristics of the target audience, endowing the design works with cultural connotations and unique emotional values (Hwang, Y. & Wu, Y., 2024). For example, when designing a promotional poster for a brand with traditional cultural heritage, designers can combine the cultural elements contained in the brand with modern design concepts, and convey the brand's cultural value and emotional appeal through color matching, graphic design, etc., forming a "human-machine collaboration" innovation model. This collaborative model not only improves design efficiency but also stimulates designers' innovative thinking, resulting in more creative design works.

2.2 The Personalized Optimization of User Experience

In the digital age today, users' demands for design are becoming increasingly diverse. The emergence of AIGC

(Artificial Intelligence-Generated Content) has made it possible to meet such diverse demands. AIGC supports dynamic content generation and scenario adaptation, enabling the generation of personalized design content according to users' different needs and usage scenarios. In terms of brand visuals, through the analysis of user-profile data, AIGC can customize personalized brand visual images for different user groups (Qu, G. X., 2023). For example, for the young and fashionable user group, AIGC can design more trendy and personalized brand logos and promotional posters, using bright colors, unique graphics, and creative layouts to attract the attention of young users. For the mature and steady user group, it can design a more concise and elegant brand visual image, reflecting the brand's professionalism.

In the design of dynamic posters, the advantages of AIGC are even more pronounced. It can dynamically adjust the visual elements of the poster according to users' real-time interactive behaviors, such as clicking and swiping. For instance, when a user clicks on a product introduction area on the poster, the poster can automatically switch to display detailed information and relevant pictures of the product. Moreover, based on data such as the user's dwell time and browsing path, it can further optimize the display content and method, enhancing the user's sense of participation and brand stickiness.

3. The Integration Strategies Between AIGC and Visual Communication Design

3.1 The Construction of an Intelligent Collaborative Design Process

In the strategy-design stage, AIGC can serve as a creative assistant, providing comprehensive support for designers. AIGC can, through in-depth analysis of a large number of design cases and market data, uncover the current design trends and changes in user needs. For example, it can analyze excellent design works in different industries, summarize popular design styles, color combinations, and layout arrangements, etc., providing inspiration for designers. At the same time, AIGC can quickly generate various design materials, such as icons, illustrations, and layout arrangements in various styles. Designers, with their professional knowledge and aesthetic abilities, can screen and integrate these materials and ideas. Designers can judge which materials and ideas are more in line with the design requirements according to the project's goals, brand positioning, and audience characteristics, and then make decisions to control the overall aesthetic direction of the design. For example, when designing promotional materials for a children's education brand, designers can select brightly-colored, cute-looking illustrations and child-friendly layout arrangements from the numerous materials generated by AIGC to create a design plan that conforms to the psychological characteristics of children.

During the design process, iterative optimization is a key link to improve design quality. Combining user-feedback data can make the design closer to user needs. Designers can input users' feedback on the initial design draft to AIGC and use AIGC's powerful computing and analysis capabilities to carry out multi-version iterative design. For example, when designing the interface of a mobile APP, users may provide feedback on aspects such as the color contrast of the interface, the size and position of buttons, and the information-display method. AIGC can quickly generate multiple optimized versions according to these opinions, providing different design plans in terms of color adjustment, layout optimization, and interaction-method improvement. Designers can then select the most suitable design from them. Through continuous iterative optimization, dynamic optimization of the design results can be achieved, making the design works more perfect.

3.2 The Balance Between Technological Ethics and Design Dominance

With the wide application of AIGC-generated content in the design field, it is crucial to clarify the copyright ownership. A "designer-led + AI-assisted" liability framework should be adopted. In the entire design process, designers play a leading role and are responsible for the creativity and expression of the final design work. AIGC only serves as an auxiliary tool to help designers improve design efficiency and expand creative thinking. Therefore, the copyright of the content generated by AIGC should belong to the designers or design teams involved in the design. However, it should be noted that the training data used by AIGC comes from a wide range of sources, and some of them may contain copyrighted content. Therefore, when using AIGC, it is necessary to reasonably consider and regulate the source and copyright of its training data to ensure the clarity and legality of the copyright chain.

Although AIGC can provide rich design ideas and plans, in the design process, we should avoid over-reliance on algorithms, which may lead to design homogenization. Human designers have an irreplaceable core position in cultural expression and emotional transmission. Designers' cultural backgrounds, life experiences, and emotional

experiences can endow design works with unique cultural connotations and emotional values. For example, when designing a tourism promotional poster for a city with a profound historical and cultural heritage, designers can integrate local historical stories, traditional architectures, and folk customs into the design, and convey the unique charm and cultural emotions of the city through unique design techniques. This kind of design expression based on human emotions and culture is currently difficult for AIGC to fully achieve. Designers should give full play to their subjective initiative, rationally use AIGC technology, and create more personalized and valuable design works.

4. Practical Scenarios of AIGC in Visual Communication Design

4.1 The Intelligent Construction of the Brand Visual System

AIGC demonstrates significant advantages in the construction of brand visual systems. In terms of LOGO design, by deeply analyzing various data such as brand concepts, target audiences, and industry characteristics, it can quickly generate multiple LOGO styles that are in line with the brand's positioning (Liu, J. M., 2024). According to case studies, the passing rate of LOGO solutions generated by AIGC is 40% higher than that of traditional designs. In the LOGO upgrade project of a well-known beverage brand, the traditional design method provided 5 sets of solutions, with a passing rate of only 20%. However, based on the analysis of the popular trends in the beverage industry, the preferences of the target consumer group, and the brand's past styles, AIGC generated 20 sets of solutions, and the passing rate reached 60%. This not only greatly improves the design efficiency and quality but also broadens the design ideas, providing the brand with more diverse choices. At the same time, the design cycle of this project completed by AIGC is approximately 70% shorter than that of traditional design, and the cost is reduced by approximately 45%.

In the design of VI extension plans, AIGC also performs outstandingly. It can quickly generate a series of application specifications and design templates based on the brand's core visual elements (Li, S. S., 2024). For example, when designing the VI extension for a chain restaurant brand, AIGC completed the design of the entire series of templates, from business cards and letterheads to in-store promotional posters, in just 3 days. The traditional design method would take at least 15 days, and the design cost is 2.5 times that of AIGC. Research shows that using AIGC for VI extension design can shorten the design cycle by approximately 50% and reduce the design cost by approximately 30%.

4.2 Dynamic and Immersive Media Design

In scenarios such as advertising, games, and the metaverse, AIGC supports real-time rendering and interactive content generation, bringing users a new experience. In the field of advertising design, AIGC can dynamically adjust the visual content and display method of advertisements according to users' browsing history, interest preferences, and other data (Jiu, D. Q., 2024). For example, when a user often browses sports products, AIGC can display product-use scenes in various sports scenarios in the advertisements pushed to this user, using more energetic colors and dynamic elements to improve the accuracy and attractiveness of the advertisement. At the same time, the advertisement can further display relevant product information and promotional activities according to the user's real-time interaction behaviors, such as clicks and swipes, realizing personalized advertising marketing.

In the game scenario, the application of AIGC can greatly enrich the game experience (Lai, B. B. & Yang, F., 2024). It can generate different game scenes, character images, and mission plots in real-time according to the player's real-time behaviors and game progress. For example, when a player explores a new area in the game, AIGC can generate unique game scenes, such as mysterious forests and ancient castles, according to the settings of the area and the player's behavior patterns, and provide corresponding mission plots and character interactions for the player.

5. Conclusion

The deep integration of AIGC and visual communication design marks a crucial turning point in the intelligentization of design. We need to strike a balance among technological innovation, ethical norms, and talent cultivation, and build a human-machine collaborative ecosystem. Designers should leverage AIGC for transformation and tap into their diverse creative potential. Future research directions include the integration of AIGC and blockchain, its application in vertical fields, the generation of highly personalized designs, as well as its combination with AR/VR, and its impact on sustainable materials and cross-cultural design. These studies can expand the application scope of AIGC, strengthen technological ethics and copyright regulations, and contribute to the cultivation of interdisciplinary design talents.

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