Research on the Application of Computer-aided Analysis System in the Concept of Visual Aesthetics in Graphic Design

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Abstract. The utilization of computer-aided analysis in graphic design mainly focuses on the design and testing of works, which helps to realize the effective use of visual aesthetics in graphic design works, and can maximize its effectiveness, so it has important research value. Based on this, this paper first analyzes the method of computer-aided graphic design, and then studies the parametric, modular and visual design in computer-aided graphic design, and finally gives the computer-aided analysis process of visual aesthetics of graphic design.

Keywords: Computer-aided Analysis, Visual Aesthetics, Graphic Design

1. Introduction

With the iterative maturity and progress of intelligent tech represented by computer-aided analysis, it has been widely and deeply studied and applied in many fields, especially in graphic design, which greatly promotes the improvement of aesthetic concept [1]. The utilization of computer-aided analysis in graphic design mainly focuses on the design and testing process of the works, so as to realize the effective use of visual aesthetics in graphic design works, so as to maximize its effectiveness. It can be seen that computer-aided graphic design can not only improve the visual aesthetic effect of the works, but also promote the effective unity of the connotation and form of expression of the work, so as to further prompt the expression ability of the work.

On the other hand, as a design with graphic language, strong artistry and full communication, graphic design is an intuitive display of the creator's intention and artistic style [2]. The current graphic design has a variety of forms and techniques as shown in Figure 1 below. Through these different forms of graphic design works, the order and rules of expression can be effectively displayed. The rules used in graphic design effectively reflect the basic principles of design geometry. Through the utilization of these basic principles, the design works can feel more harmonious, symmetrical and balanced visually.
2. Computer-aided graphic design method

2.1. Computer-aided design process

According to the needs of the design, the graphic designer transforms the assumption of graphic design into a practical technical scheme through the process of thinking, rules, analysis and decision-making. The computer-aided design process is shown in Figure 2 below. The design process conforms to the nature of computer systematization and programming. The types of CAD mainly include function design, layout design, parameter design and tolerance design.

2.2. The necessity of computer-aided graphic design

First of all, in the functional design stage of graphic design, the proportion of new design is often small, while in the process design stage, the labor efficiency is low and the work is cumbersome.
Secondly, in the production level of graphic design works, there are a series of phenomena and problems such as short residence time and long circulation time. After determining the task, through abstraction, drawing up the functional structure, seeking the appropriate action principle and its combination, the basic solution approach is determined, and the design work of the solution scheme is obtained, as shown in Figure 3 below. Therefore, it is necessary to apply computer-aided graphic design.

![Diagram](image)

Figure 3. Computer-aided conceptual design.

2.3. Computer-aided aesthetic conceptual design
Graphic design works should not only meet the functional requirements of people, but also adapt to the aesthetic feeling of users and meet people's psychological needs. The shape, texture and color of graphic design works often play an unexpected function. Computer-aided aesthetic conceptual design is mainly carried out from the aspects of color, shape and material, so as to realize the modeling design of plane products [4]. Computer-aided aesthetic conceptual design is one of the important media to express thoughts and feelings, transmit information, and meet people's visual evaluation and use needs.

In addition, the basic aesthetic principles of form beauty of CAD based on aesthetic concept mainly include proportion and scale, balance and stability, unity and change. Through the color display product function, including color coordination should have color tone, create harmony in use, creatively reflect the relationship between light, shadow and color, focus on color texture, and handle the relationship between color and material texture.

3. Parametric and visual design in computer-aided graphic design

3.1. Connotation of parametric and modular design in graphic design
Parametric design can change dimensional constraints in graphic design, while variable design can change dimensional constraints and topological relationship of graphic design. The modular design in graphic design can divide and design a series of relatively common functional modules on the basis of functional analysis of graphic design works. Through the selection and combination of modules, works with different functions or different performances and specifications with the same function can be formed.

3.2. Visualization tech in graphic design
With the help of CAD software, the visualization tech of surface modeling, color and illumination rendering in graphic design is provided [5]. In addition, with the help of concept graphics display, structure, assembly relationship graphic description, grid model display, data display and computer simulation process, the process of data, information management, conceptual design, detailed design and production control management of graphic design works are realized. In addition, with the help of visualization and parametric design, it can realize the organic unity of practicality, interest and aesthetics of graphic design works.
3.3. Visual aesthetics of computer-aided graphic design
Graphic design works of the main graphic language to express the creative concept of the creator, and reflect the artistic works [6]. The use of computer-aided graphic design and creation, we need to pay attention to the beauty of order. Among them, the use of visual aesthetic elements in computer-aided graphic design works helps to enhance the harmony and aesthetic feeling of graphic design works, and enhance the organic proportion and harmony between the elements of works, and enhance the artistic effect of works. In addition, the integration of visual aesthetic elements into computer-aided analysis can improve the visual aesthetic cultivation of the works, and combine the visual aesthetics organically, so as to create more aesthetic graphic design works.

4. Computer-aided analysis of visual aesthetics in graphic design

4.1. Architecture of computer-aided analysis system for visual aesthetics of graphic design
Graphic design works based on the principle of geometric composition can enhance the cohesion of their creation, and can enhance the visual sense of belonging of the elements of the works. As an aesthetic index for the analysis and evaluation of graphic design works, attention should be paid to the function of visual aesthetic elements in the graphic design process of computer-aided analysis. Therefore, the architecture of the computer-aided analysis system for visual aesthetics of graphic design is shown in Figure 4 below.

![Figure 4](image-url)

Figure 4. The architecture of the computer-aided analysis system.

In the beginning of the graphic design process, with the help of computer-aided system to import images to realize the analysis of the drawing sheet. Secondly, with the help of the computer, the system is set up to ensure the stability of the image. In addition, with the help of computer-aided analysis of the segmentation line, or with the help of the analysis template of the standard auxiliary line, it could realize the analysis of the graph.

4.2. Utilization of computer-aided tech in graphic design
First of all, with the help of computer-aided tech, the construction of geometric aesthetics in graphic design is realized, including the construction of symmetry aesthetics and the construction of golden section point aesthetics. Secondly, with the help of computer-aided analysis software represented by AutoCAD software, 3D Max software and Photoshop software, graphic design works can achieve higher visual aesthetic requirements. In addition, the important utilization of computer-aided system in graphic design lies in the construction of the platform and the use of auxiliary tools. Among them, the construction of the system platform can build a complete system framework, and the use of auxiliary tools can achieve better data processing.

With the iterative progress of computer-aided tech represented by graphics, visual analysis and other technologies, relying on computer-aided system to carry out graphic design can create more realistic details and rich textures, so that the effect of graphic design will change essentially. With the development of intelligent platform represented by mobile terminal AI, graphic design of visual
The aesthetic concept can create more personalized and diversified works and schemes, which greatly improves the future development of visual aesthetics of graphic design.

5. Conclusion
In summary, the utilization of computer-aided analysis system in the concept of visual aesthetics in graphic design can provide a more convenient and convenient platform for creators, and promote their support and judgment in design geometry theory. In addition, it emphasizes people's subjective initiative, and the use of computer graphics tools can better achieve the control of various elements in the creation of works. Through the analysis of computer-aided graphic design method, this paper studies the process of computer-aided design and the concept design of auxiliary aesthetics. Through the research of parameterization, modularization and visualization design in computer-aided graphic design, the design process of modularization and parameterization is analyzed. Through the research on the utilization of computer-aided system of graphic design visual aesthetics, the architecture and utilization process of computer-aided analysis system of graphic design visual aesthetics are given.

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