Study on the Performance of Light and Shadow Effect in Computer Aided Interior Design

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Abstract. With the rapid development of computer technology in China, interior design has also ushered in a broader space for development. Light and shadow effect is an important trend in art design. Through the designer's artistic accomplishment, we can further enhance the presentation ability of interior design lighting effect. In practical design, we need to fully consider the physical properties of real life materials. Through reasonable rendering, we can achieve the best performance of light and shadow art. This paper first analyses the significance of Computer Aided Interior design. Then, this paper analyses the light and Shadow form and artistic expression of computer-aided interior design. Finally, this paper designs the interior lighting design effect of a hotel.

1. Introduction
In recent years, China's three-dimensional software design technology has developed rapidly, especially with the use of 3D MAX. 3DMAX is one of the main software for interior design applications. The application of computer aided technology in interior design has been growing rapidly. In interior design, the intensity of light and shadow effects directly determines the brightness of interior space, which has become an important development goal in interior design work. Designers often achieve unique artistic effects through the expression of light and shadow effects. Designers should remodel art in the design of computer aided design software such as 3D, CAD, AI and so on. They will integrate low-carbon, energy-saving, environmental protection, green and other concepts into the design, which will enhance the visual presentation of interior lighting effects.

2. The significance of computer aided interior design

2.1. Computer aided design determines the practical feasibility
Many excellent interior designs are inspired by designers. Designers often use graphics and their forms to achieve inspiration. Computer-aided software realizes the transformation of inspirational manuscripts. At the same time, it realizes the original imagination to measure accurately. We can monitor the feasibility of side imagination by using effect maps. These applications are particularly obvious in interior lighting design.

2.2. The technical advantages of computer-aided interior design
At present, computer aided technology has been widely used in interior design industry. Computer-aided software has become the first tool for interior designers. In light and shadow design, computer-aided design can produce fundamental changes. It will better show light and shadow, color, material, reflection
and so on, which can not be achieved by traditional design schemes. At the same time, the computer can realize the perfect embodiment of details, which reflects the actual effect.

3. Light shadow form of computer aided interior design

3.1. Brief introduction of light source
Projection will inevitably occur under the action of light source. Different light and shadow configurations, different light sources will produce different light and shadow effects. At present, it is generally believed that the role of light and shadow in interior design is to illuminate the scene and beautify the environment. Excellent interior design, good lighting effect is one of the most important reasons. Shadows in light and shadow are areas that are hidden or invisible when light illuminates an object. The existence of shadow plays an important role in foiling light, and it has a significant impact on the determination of spatial relations. Light and shadow effect can judge the position of light source and the material quality of objects. It is an important form of visual art effect in interior design. In interior design, the common photoelectric sources are point light source, surface light source and line light source. The physical properties of light include reflection, diffuse reflection, transmission and directional transmission, as shown in Figure 1.

3.2. Art performance of light and shadow in computer aided interior design

3.2.1. Artistic expressions of different light and shadow intensities
The artistic expression of light and shadow art forms requires different intensity of light and shadow. Generally, interior design is divided into different requirements such as home, entertainment space and office. In the design of home space, the requirements of light and shadow tend to be more gentle, which will achieve a warm feeling, as shown in Figure 2. (a). In office design, the requirements of light and shadow are usually higher brightness in order to be bright and open space, as shown in Figure 2. (b). In the entertainment space, through the shaping of local light and shadow, the design with more abundant performance is shown in Figure 2. (c). Therefore, in the computer-aided interior design, we should be able to carry out reasonable lighting and shadow art performance according to different living requirements.
3.2.2. Perception conditions of light and shadow design
In the light and shadow art design, we need to design light and shadow as a positive element. When conveying Designers' ideas and concepts, if the perceptual characteristics of light and shadow are too rough and simple, we can not evoke the specific schema of people's memory consensus. Special shadows are often subconsciously considered as appendages of objects produced under light. This passive formation process is more likely to cause psychological neglect, as shown in Figure 3. In the art design of light and shadow composition, the designer carefully conceives and expresses the graphic language expressiveness of light and shadow, which can easily perceive the charm of light and shadow. And in the design, we need to strengthen the shape and meaning of light and shadow, which can break through the non-material nihility. Enhanced light and shadow will be the focus of the light environment, as shown in Figure 4.

![Figure 3: Neglectable shadows](image1)

![Figure 4: Shadows of visual focus](image2)

4. Light and shadow composition design of a hotel lobby
The artistic conception created by light and shadow composition is one of the carriers of human aesthetic orientation and spiritual pursuit. The importance of light and shadow is bound to be presented orally. It will also be valued by designers and space users. Designers should strengthen the aesthetic and spiritual perception of artistic conception, only in this way can we design a good interior artistic conception. The floor plan of a hotel lobby is shown in Figure 5.

In the sunken space, light and shadow design can increase the depth of space. This method of creating elegant space atmosphere will give space poetic mood. Through the design techniques of light-image composition, such as three-dimensional, two-dimensional, composition artistic conception, light-image bottom relationship processing, this paper finally adds the design of light-image composition around the space, the effect is shown in Figure 6. Light is the shadow. The design expresses the relationship between light and shadow from the perspective of shadow. The light, hidden, dim and restrained expression of the shadow represents the aesthetic orientation of people's elegance and purity.

![Figure 5: The floor plan of a hotel lobby](image3)
Through the design practice, the light and shadow composition design method is applied to the indoor light environment design, which solves the realistic problem of stressing light and lightening shadow in the indoor light environment design. Through light and shadow composition design, shadow has a passive position different from ordinary light and shadow concept, which has been given a unique position and personality. Light and shadow break through as an appendage of light, it has turned into a stage of fantastic and changeable protagonists. They changed the general idea and the bottom-to-bottom relationship of light in the scene.

5. Conclusions
Most of the traditional interior design work is based on two-dimensional design media. Designers use two-dimensional media to achieve three-dimensional effects. At present, computer technology has made important applications in the field of design. It is of great significance to improve the efficiency of design. Computer aided technology has obvious technical advantages in three-dimensional modeling, rendering, color and so on. Therefore, the indoor lighting effect can be fully expressed through computer-aided software. At present, the main influence of computer aided design on interior design is as follows.

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