# Research on Interior Design of Old-Age Housing Based on Design Psychology

**Yuan ZHANG**

Liaoning Communication University, Shenyang, 110000 Liaoning, China

sjzm_110@163.com

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**Abstract:** With the improvement of people's living standards, the current interior decoration design standards for old-age housing can no longer meet the needs of the elderly, and the requirements for architectural aesthetics are more stringent. As a special discipline, visual psychology has high application value in residential interior design, which can not only make indoor space more comfortable, but also make residential interior design meet the needs of residential residents, and also effectively promote the development of related industries and social economy. The harmony between color and space is related to the overall aesthetic degree of space, and the study of aesthetic significance of visual form is the most effective way to solve this problem. This article organically combines the general research and individual research of visual form aesthetics, in order to provide fresh materials and beneficial attempts for the application research of visual form aesthetics, and thus provide theoretical and technical support for the interior design of elderly homes.

## 1. Introduction

Nowadays, the aging population is becoming a worldwide trend at an irreversible speed. At the same time, a large number of elderly people with a sustained growth rate have ushered in a structural transformation of the population around the world. This new record of population aging will have many negative effects on global politics, economy and culture in the future [1]. As a special discipline, visual psychology has high application value in residential interior design, which can not only make indoor space more comfortable, but also make residential interior design meet the needs of residents, and effectively promote the development of related industries and social economy, which plays a very good role in promoting the progress and development of residential interior design in China [2]. With the improvement of people's living standards, the current interior decoration design standards for old-age housing can no longer meet the needs of the elderly, and the requirements for architectural aesthetics are more stringent [3]. Because this design element has been widely used in residential interior design, it is of great value to study it, which can meet the actual psychological needs of consumers and realize the long-term progress and development of building decoration industry [4]. On this basis, the residential interior design industry is developing rapidly, the design concept is constantly innovating, and the disciplines involved in design are constantly increasing, which improves the quality of residential interior design [5]. In this process, the application of visual psychology in residential interior design has played an important role.

The main mode of providing for the aged in China is to provide for the aged at home, so we should pay more attention to the living environment of the elderly at home. However, with the aging of people, the deterioration of physiological functions and various diseases have gradually emerged, and the problem of safety and comfort has been highlighted in home-based care for the elderly compared with social institutions [6]. With the rapid development of China's social economy, the living standard of China people has been significantly improved, which puts forward higher requirements for the quality of home life, which brings many opportunities for the development of interior design industry [7]. If you want to take the initiative in the fierce competition market, you must change the design concept and design techniques, improve the level of residential interior design in many ways, and provide a better living environment for the people of China [8-9]. The feeling of housing is not limited to the economic and practical use of housing,

but also the pursuit of beauty and generosity, focusing on spiritual enjoyment. By applying visual psychology to interior design, interior designers will bring people a brand-new living environment and make residents feel more comfortable and pleasant. Moreover, the development of this technology can affect the development of other related industries and give this industry new ideas [10].

## 2. Relationship between Indoor Space Structure in Visual Form

Home-based old-age care model is a new old-age care model based on family life, community support, professional service and living at home. This new way of providing for the aged in the form of “family nursing home” not only inherits the traditional form of providing for the aged at home, but also makes use of the comprehensive strength and resources of the community and society to meet the real psychological and material needs of the elderly and make up for many shortcomings of the old-age care institutions to some extent [11]. From a psychological point of view, vision has certain advantages in selecting stimulating objects in the selection of external content, and it will give priority to selecting more characteristic stimulating contents. These things are more prominent to the visual senses and can be perceived first, which is a new object with priority. Lines produce a sense of distance in space through the changes of reality, weight, strength and thickness, and express the relationship between shapes and the distance before and after, thus producing a sense of perspective. In sculpture and architecture, line is not only the outline of modeling, but also the skeleton of its structure [12]. In Gothic architecture, the empty inspiration and lofty feeling of eating too much are presented through lines. Similarly, the inner sense of space is also reflected by the use of arched and transparent lines, which adds to its sense of upward strength.

Inherent superiority is one of the characteristics of visual psychology, which shows that people's vision will give priority to sensibility for moving objects and objects with bright colors and strong contrast. This characteristic has been well applied to the interior design of residential buildings. Because of the space limitation of vision, people can't have a panoramic view of a room, and they will pay more attention to some places. Therefore, attention should be paid to distinguishing the main part from the secondary part in interior design. Under the same things, objects with brighter colors are always more attractive than those with less obvious color contrast; In a specific space, new things are more noticeable than the original ones; In the stage of placing things, regularity will make people look more comfortable than irregularity. Visual psychology is an important subject of general psychology, which can cause psychological effects by taking in external objects through the eyes [13]. Visual psychology links the external objects taken by vision with psychological reaction, and the specific process is very complicated, but sometimes the effect is really beneficial to human spirit. Due to the limitations of the eye structure, people's visual cognition and capture range have certain spatial limitations in the actual social space mastery. In interior design, through the construction of senses, people will have corresponding visual illusion, improve the overall visual effect and form a strong visual impact. In the design of indoor space, the visual illusion can be used to reasonably transform the space area.

## 3. Image Color Transfer Algorithm

Integrating visual psychology into interior design can further enhance the sense of order in space. Because of the obvious preference for color in human aesthetic concept, the design and processing form of sense of order is not static, which can be contrasted with visual impact and other stimulating contents to highlight the theme style of interior design and decoration and ensure the simplicity and integrity of design. On the one hand, color modeling is possible because of the nature of color itself; On the other hand, it comes from the interaction between human vision and color [14]. All colors perceived by human vision have three properties: hue, lightness and purity, which are the most basic elements of color composition. The principle of color modeling is similar to that of body perspective. Integrating visual psychology into interior design can reasonably integrate

multiple resources in the field of vision, create a good external environment, and form a perfect visual sensory effect. In visual psychology, the incoherent and defective parts can be readjusted to achieve the optimal value. Because small parts can be deleted in interior design, new visual highlights can be formed in interior space, resources within the visual range can be integrated, the impression of interior design style can be deepened, designers can enjoy the integration and careful design of visual content, and the sense of physical and mental pleasure within the visual range can be enhanced. The spatial state estimation stage of three-dimensional reconstruction of interior design is shown in Figure 1.

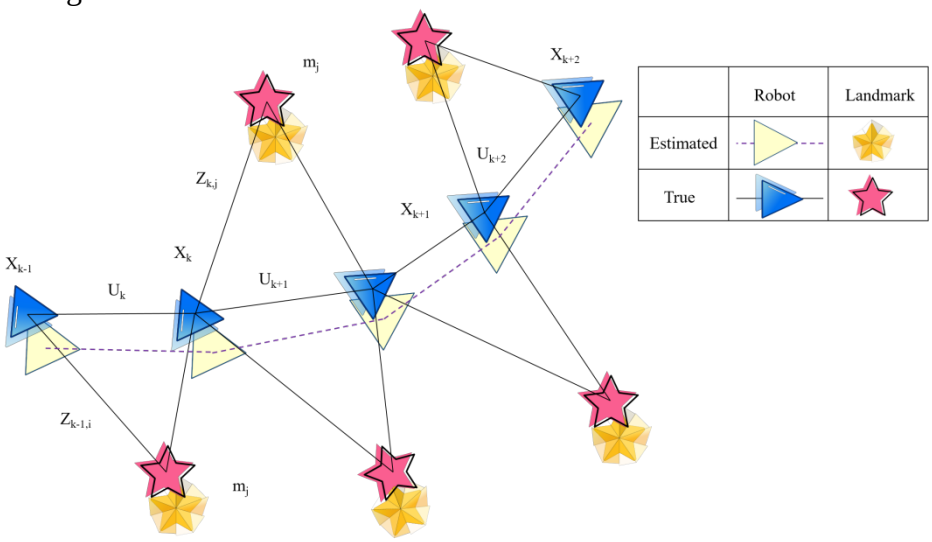


Fig.1 Spatial State Estimation Stage of Interior Design 3d Reconstruction

When matching the colors of interior decoration materials, the harmonious color matching is the key factor to be considered. Adjust the colors to be processed according to a reasonable color harmony template to obtain a harmonious color matching result.

In order to verify the effectiveness and practicability of the color transfer algorithm in this paper, this section tests and analyzes the performance of the system. Firstly, the different number of interior design pictures and the time needed to process interior design pictures with different number of nodes are tested. The experimental results are shown in Figure 2.

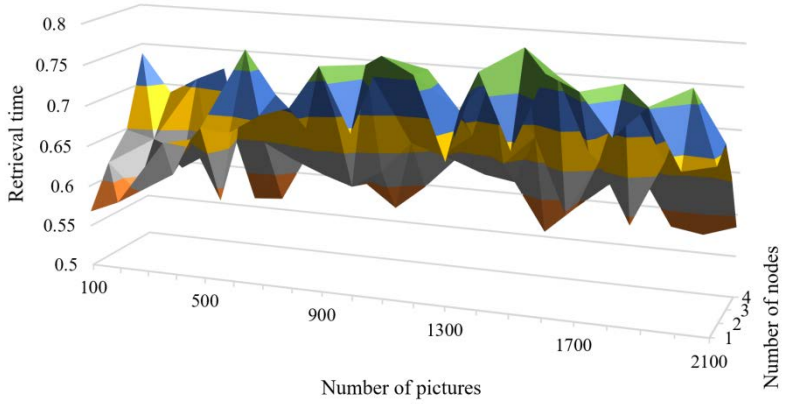


Fig.2 Image Processing Consumes Time

As can be seen from Figure 3, with the increasing number of images, the advantages of multiple nodes become more and more obvious. Therefore, when the number of interior design images is large, the efficiency of processing can be obviously improved by using the proposed color transfer algorithm.

If the color transfer algorithm based on low-order moment statistical characteristics is used, the target image has achieved good transfer effect, so even if it is processed by the color transfer algorithm with high-order moment matching strategy, its transfer effect will not change. For some

pictures with poor transmission effect, the effect is expected to be improved if other image features such as texture features or spatial relationship of images are combined in the matching stage of finding the best matching point.

## 4. Conclusions

This article organically combines the general research and individual research of visual form aesthetics, in order to provide fresh materials and beneficial attempts for the application research of visual form aesthetics. Integrating the general and individual studies of visual form aesthetics organically, in order to better provide fresh materials and beneficial attempts for the application research of visual form aesthetics, and thus provide theoretical and technical support for the interior design of elderly homes.

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