

Research on the Application of Fractal Theory in Interior Design

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Abstract: With the development of society, people are showing a trend of diversified needs for living space, and the requirements for interior space design are getting higher and higher, hoping to obtain a high-quality space experience to meet their multi-dimensional requirements for the environment. However, because the current interior design works generally pay too much attention to market changes, it directly leads to the repetition and standardization of spatial forms. Most people believe that such conventional design forms do not meet their own individual pursuit. Therefore, people began to try the uniqueness of interior design, strengthen the sense of space experience, and in form, began to emphasize the application of natural forms. Among them, the emergence of fractal theory can well solve the problem of excessive standardization and modernization of interior design content while ignoring the natural senses. In view of this kind of situation, this article will start with the significance of the application of fractal theory in interior design, and fully develop the application research of fractal theory in interior design.

1. Introduction

Fractal theory is a supplement to traditional geometry. It emphasizes the deconstruction of the form of natural scenery. It also has the meaning of “irregular” and “broken”. The expression form of traditional geometry is relatively regular, and the calculation method is completely fixed algorithm. If it is irregular content, it is difficult to carry out standardized operations. Therefore, fractal theory emphasizes that the traditional geometric design form ignores the aesthetic diversity and calculates in natural forms. Among them, irregular forms occupies a dominant position, and the law is implicit in the form, and on the basis of this law, it presents a rich and diverse form of change. Therefore, part of the data is obtained through the fractal method, and then through the integration method To obtain complete data is the core algorithm of fractal theory. At present, my country’s interior design has inertial dependence on the application of traditional geometry. It uses regular geometric figures to decorate the space, and there are certain limitations in the form of expression. Therefore, it is hoped that the space environment can incorporate part of the natural sensory experience. Therefore, fractal theory has become one of its core points.

1.1 The Significance of the Application of Fractal Theory in Interior Design

1.2 Provide Inspiration for Modern Design

The application of fractal theory in interior design is an important manifestation of its development. It began to put an end to the problem of blindly emphasizing regularity, and gradually integrated humanized content and naturalized content into it. For modern interior design, one of the core meanings of the emergence of fractal theory is to provide better inspiration. The content of reference in traditional design is mainly geometric figures. The figures themselves are relatively fixed and regular. They can only be used or deformed, resulting in a single design form. The fractal theory emphasizes irregular changes, and can refer to the content of elements from the natural world, such as the fission form of bark, irregular changes of clouds, etc., which can be applied to modern interior design to ensure the visual presentation of interior design, which is more in line with The aesthetic needs of modern people.

1.3 Strengthen the Natural Elements in Modern Design

In traditional interior design, the element content is centered on abstract shapes. Both geometric

figures and regular architectural shapes have undergone a high degree of abstraction and generalization, and the form tends to be more rational and logical. Although the use of the entire space is more efficient, due to excessive compliance with the rules of geometric figures, it is inevitable that there will be a single form and insufficient change. Fractal theory is integrated into modern interior design. One of the biggest characteristics is that it strengthens the natural elements in form. The so-called diversity is the natural form, which is its original state. Therefore, the irregular form is more in line with the laws of nature. Therefore, with a large number of irregular or broken content combinations, the form of modern interior design is increasingly inclined to be highly naturalized and differentiated, which meets the individual needs of people for spatial forms. Therefore, fractal theory is a reference to modern interior design. Useful and necessary supplement.

2. Formal Features in Fractal Theory

2.1 Roughness

Fractal theory originated in nature, so its own formal characteristics must conform to the characteristics of nature. One of them is called roughness. Simply put, the object of fractal theory research is basic nature, which includes mountains, trees, etc., whether it is mountains or trees, the details are rough, without artificial polishing, reflecting a natural characteristic. Especially the characteristics of constant superposition and repetition, in essence, already has a certain degree of self-similarity. Under similar overlap, it means that roughness becomes a manifestation in the natural form. Therefore, in fractal theory, one of its main formal characteristics is always considered to be roughness. Compared with self-similarity, roughness is more macroscopic, which is a partial overall concern, which is somewhat different from self-similarity.

2.2 Self-Similarity

The second form feature of fractal theory is self-similarity, which is derived from bionics. On a theoretical basis, observing the details of any natural substance, you will find overlaps in genes, resulting in similarities in some details, and even parts with extremely high similarities can be completely overlapped to achieve consistency. But it is only based on certain levels. If it continues to split, it will show differences and become self-similarity again. In other words, self-similarity is based on a certain range, and careful observation of the part will always become self-similarity at a certain level, and continued subdivision will break its self-similarity and form irregularities. Dating, therefore, in fractal theory, self-similarity is an extremely great research result.

2.3 Irregularities

Fractal theory has always emphasized natural forms, which means that it has very strong irregularities. Everything in nature grows naturally, and there will be diversified changes due to all possibilities, which also means that everything in nature is a different and special individual. The elements emphasized in modern interior design are abstract, lacking diversity and difference. However, based on the fact that there is still self-similarity in fractal theory, it means that the irregularity in fractal theory is also on a certain level, that is, there are irregularities in some layers, and after another subdivision, to some points. In the layer, there may be self-similarity. Generally speaking, an independent individual is formed through the combination of similarity and irregularity. Therefore, irregularity is a major research breakthrough in fractal theory.

2.4 Scale Invariance

According to fractal theory, self-similarity itself has certain variable factors, which can be called scale invariance. In self-similarity, most similarities are only partial, but from the overall perspective, the partial appears only through expansion or contraction. Take the tree rings as an example. Although each circle may be different, there must be relative consistency in local characteristics. For example, for some special characteristics in the year, the characteristics themselves are unchanged, just because The increase of the circle layer, while expanding or shrinking, this kind of simple expansion or reduction means that the scale is not deformed, and

certain basic characteristics will not change under any circumstances. It is based on the invariance of the scale, and thus the derived self-similarity and roughness, but also because the invariance of the scale is broken, and irregularities appear.

3. The Application of Fractal Theory in Interior Design

3.1 Application in Space

Interior design usually contains several major elements. One of the more common elements is space element. The existence of space element means that interior design is centered on spatial integrity. Among them, space is an objective form of material existence, which depends on form. That is to say, one of the manifestations of space is the shape, and the change of the shape represents the change of the space itself. If the space is a cuboid, the shape must be a cuboid, and if the shape is changed from a cuboid to a cube, the space will also become a cube. . Therefore, the relationship between space and form is very important, which also means that the integrity of space is very important. In some cases, space is indivisible, that is to say, once a state of division appears, it is no longer a single space, but multiple composite spaces. When limiting the indoor space, it needs to rely on the shape , The body depends on the space. In other words, the shape is used to divide the space. The shape that exists in the space forms the role of space cutting and blocking, making the shape of the space more aesthetic, and the indoor space usually meets the needs of artistry and practicality. The application of fractal theory in indoor space tends to be more artistic. That is to say, traditional space design mainly emphasizes the maximization of space utilization. After integrating fractal theory at that time, the main factor is the beauty of space. Space has rich scale levels and changeable combination forms. This spatial level is usually similar to the overall spatial form with a simple operation. In other words, the two-story space often emphasizes its self-similarity for aesthetics.

3.2 Application in Structure

In modern architecture, the fractal theory can also be fully used in the structural part. In the construction of the structure, it is also required to inject beauty to shape the overall aesthetic effect. Deconstructing morphology in the context of fractal theory usually uses nonlinear rules to break the morphology of conventional spaces. That is, the design of the space is completed through unconventional methods such as fractures and interlayers to ensure that the aesthetics of the space design meets the individual requirements pursued by people. Moreover, when the fracture is generally carried out, accidental changes will occur, which can be in accordance with the needs of users. It can be adjusted at will, and the angle and tendency of the fracture can be adjusted. Therefore, when the spatial structure is changed, the entire spatial effect and artistic tension are displayed. In other words, as long as the spatial effect and artistic tension can be shown, structural adjustments in any situation are allowed, and when the artistry is emphasized, more attention is paid to its uniqueness rather than its regularity. . For example, Bubbletecture M, “Bubbletecture M” (Bubbletecture M) is a bubble-shaped wooden structure kindergarten located in Osaka designed by the famous Japanese architect Endo Hidehei. A lot of structural design content based on fractal theory is used in this building, and an absolute sense of art is created through huge changes in the structure and irregular structures. Its huge shell-shaped roof is connected by triangular faces to form a whole roof, full of structural beauty and geometric continuity. Its structural strength and geometric shape give a lot of freedom in space design. It is a classic brush of the entire work and also represents the building. The eclectic morphological design itself uses irregular shell shapes and irregular triangles, which also shows the designer's ability. At the same time, wooden structural trusses and prefabricated triangular panels form a continuously changing bubble-shaped shell space. Under this continuous shell space, the ceiling height changes smoothly, and the space is like a cavity in a living body. It perfectly embodies the theme content of the whole building, and on the whole, there is also a very strong bionics basis, so that the entire form has a strong growth, and perfectly reflects the design requirements of fractal theory.

3.3 Application in Interface Modeling

In interface modeling, the application of fractal theory has begun to appear difficult, mainly because the interface itself has the function of dividing. The application of traditional geometric figures will make the interface more regular, while the application of fractal theory may lead to spatial chaos. , Affecting the functionality of the space, causing the problem of the space function not functioning normally. Therefore, it is very important to explore the nature of the interface in detail. The interface has the function of dividing and blocking in the indoor space. This means that the intention of the interface is not to connect the entire space together, but to give each space a fixed attribute, so as to give the space more functionality and meet people's needs for space. At the same time, the interface modeling directly affects the layout and form of the entire space, and also plays a decisive role in the overall space atmosphere and style. In other words, the interface not only has the function of functional segmentation, but also has an aesthetic function. A more reasonable layout of the space will ensure that the entire space is smoother and the shape is more beautiful. The core content of fractal theory is to express the complexity and variety of aesthetics. For example, the interface style of Hong Kong Youtiandi Cafe. Through the display of hexagonal geometric shapes, the sense of space and quality are combined to the best. This breaks the traditional geometric modeling concept and chooses the rarely used hexagons, which is a breakthrough to the tradition. However, overall, the visual effect has a strong sense of order. At the same time, this type of hexagon also has its own The similarity conforms to the design idea of fractal theory. At the same time, the concept of plane is transformed into a three-dimensional hexagonal shape, and the hexagonal structural shape shows dynamic changes in a neat and suitable layout. Compared with traditional interior space design, the design language of this kind of space has more dynamic effects and is more in line with people's visual laws, so it is widely used. At the same time, the irregular juxtaposition of similarities greatly increases the charm of space groups, creating a dynamic space full of rhythm. It seems to be a perfect interpretation of fractal theory, reflecting the changes in order, rhythm and rhythm.

3.4 Application in Materials

In modern interior design, materials are an important element, and any content modification cannot do without materials. In the fusion of fractal theory, materials are also a key link. Materials are the material basis and means to realize the interior design. Without the combination of materials, the completion of the space design plan cannot be guaranteed. The participation of materials is required for the change of the spatial form or the realization of the decorative effect. Therefore, in the interior space, materials not only have the carrier function of design, but also have cultural and artistic attributes. The main thing is that materials can be used to create more forms to ensure that the shape conforms to the expression of the design language. At the same time, materials also play an important role in shaping the emotion and art of the entire space.

4. Conclusion

In summary, modern interior design can no longer meet people's actual needs. People pursue modern space design to have a soul and be more natural. Therefore, it is necessary to expand design ideas and propose design methods that are more in line with people's needs. The core content is the application of fractal theory. Through this theory, the individual design performance can be guaranteed and it is more in line with the laws of nature. At the same time, fractal theory is not a fixed design method, but a design idea, which gives a higher degree of freedom to the presentation of design. At the same time, it has performance in space, structure, interface modeling and materials. Therefore, the application of the content of fractal theory is subversive to the current spatial design performance, thus realizing a diversified spatial experience.

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