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Research Article

Artistic Style Analysis of Root Carving Visual Image Based on Texture Synthesis

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Texture synthesis is a hotspot of research in the field of realism and nonphotorealistic rendering, with applications in virtual reality, computer vision, and other areas. It has a wide application prospect in image editing, filling of defective images, data compression, rapid transmission of network data, generation of large-scale scenes, and rendering of realistic and nonrealistic images, and it is used to solve the problems of seam, distortion, and parameter adjustment of traditional methods. Root carving is a one-of-a-kind plastic art form that dates back to the Xia and Shang dynasties and peaked during the Ming and Qing dynasties. Texture synthesis uses existing texture data to create a large-area texture that looks similar. This technology detects matching points in the sample texture and copies them to the output image, resulting in a texture image that is similar to and continuous with the sample texture. Realistic and nonrealistic rendering, image restoration, and computer-aided design are just a few of the applications. Texture can describe a variety of natural phenomena with repeating features, as well as expressing the rich details of an object's surface. Because of its characteristics of both practicality and artistry, as well as the coexistence of popularity and elegance, the art of root carving retains its unique charm despite its ups and downs as a more than 2,000-year-old art form. A genetic evolution search strategy is used to propose an optimization search algorithm in this paper. We further investigate the ecological aesthetic characteristics of root carving art, in accordance with the nature of its aesthetics. By using a genetic search strategy, you will be able to find what you are looking for faster. A better matching block can be quickly found to complete the search for the best matching block, speeding up the algorithm's search process and ensuring better synthesis results.

1. Introduction

To create a root carving with artistic characteristics, we first need to look for distinctive roots in nature. Pour all your emotions into it, and use the creative inspiration given by nature to give us a new life [1, 2]. However, in the field of image processing, realistic rendering has always been an important research content, and the most primitive manual rendering is difficult to meet the actual application needs in terms of efficiency and quality [3]. Therefore, combining realistic graphics with computer image-processing technology, the needs of graphics and images can be realized conveniently and effectively. Texture is the important and basic expression of image presentation information [4]. People want pictures to be clearer and more realistic and virtual scenes to be more realistic [5].

The original procedural texture synthesis directly simulates the surface texture generation process, simulating the fine structure of the object surface [6]. The detailed features of object surfaces are intricate in the real world [7]. A large and complex amount of calculation is required if they are represented by a mathematical model. Researchers combine the natural texture of the object surface with computer image-processing to reduce computational complexity and construct the surface texture of objects with high efficiency and quality. A texture synthesis technology [8] is created by combining the technologies. The texturing process is also important in graphics for presenting the details and

comprehensiveness of objects. Global perception and local perception are commonly used perception strategies in the visual information processing process [9]. The goal of sample-based texture synthesis is to take a sample texture and learn its unique texture features and repeating patterns, then use that information to create new texture images of any size with similar patterns and repeating patterns [10]. For a long time, using computers to reproduce the three-dimensional world has been a major aspect of computer technology application and development. It has a wide range of applications, including the creation of special effects for film and television, game projects, and some virtual reality-related industries [11]. The synthesized texture should not be a simple copy of the sample texture, and manual inspection is usually used to assess its quality. If there are no obvious human errors and noise problems in the generated texture, the texture is successfully synthesized [12]. Texture can show rich detailed features of object surface, which plays a very important role in computer graphics rendering, and texture synthesis is an effective method to create new texture. Based on the given small area texture samples, according to the geometry of the object surface, it is combined to generate any size texture image, which is visually similar and continuous.

Although there have been many advances in large-scale generation and similarity generation in recent years, existing texture synthesis methods still have inherent human errors and lack universality. Texture synthesis technology is a relatively new type of texture synthesis technology that has exploded in popularity in recent years. As a result, using texture synthesis to create new textures to enhance the surface details of objects has become a hot topic in machine learning [13–15]. People can use texture synthesis technology to change the artistic style of an image in addition to manual drawing when they need unique artistic images. It is one of many research key technologies in the fields of computer vision, computer graphics, and image processing, and it has become an indispensable key skill in computer graphics up until now.

2. Related Work

Reference [16] first proposed texture mapping, which successfully completed the rendering of surface texture and achieved good visual effect and efficiency. However, when making surface texture and large-scale texture, the common texture mapping methods will produce seam errors and distortion. Reference [17] proposed that the solid texture function has achieved good results in simulating the carved surface. The algorithm introduces a three-dimensional function, which can simulate water grain and marble well. Literature [18] proposes an asymptotic analysis-based synthesis algorithm, which uses Laplace and image pyramid for texture synthesis. The algorithm has achieved good results for random texture but ignores the effect of structural texture. Literature [19] uses a basic one equation and proposes a new method to generate a small number of triangles. To realize texture stitching, literature [20] proposed a point-by-point synthesis method based on GPU, which can realize real-time synthesis at runtime. Multiresolution pyramids are used for texture synthesis in literature [21]. To process texture images, two Laplacian pyramids and filters are employed. This method produces good results for structural textures, but it is easy to generate artificial traces for textures with ambiguous structures. For texture synthesis, literature [22] uses Laplacian and controllable pyramids, with two Laplacian pyramids and filters used to process the texture. When looking for a match, the points of the synthesized parent layer are taken into account, and one of the qualified points to be chosen is filled in at random, which has a pleasing effect on the overall texture. The algorithm of overlapping irregular texture blocks on a three-dimensional curved surface was proposed in literature [23]. Set some seeds in the image to be synthesized first, then search for matching points in the sample image through a given neighborhood, and randomly select one of the eligible candidate points to fill in, according to literature [24]. Literature [25] proposed an optimization-based texture synthesis method that generated textures pixel by pixel, with the generation effect clearly superior to that of pixel-based and slice-based texture synthesis methods. Using the greedy search method, a pixel to be generated looked for several matching pixels in the input sample

3. Aesthetic Features and Expressions of Root Carving Art

3.1. Presenting the Beauty of Nature, Craftsmanship, and Artistic Conception. Root carving is an art form that shapes images and expresses feelings by using the root material's own form [6]. The study of human aesthetic activities is known as aesthetics [26]. The Sui and Tang Dynasties' imperial palaces have dragon-shaped decorations, the Five Dynasties' noble rooms have exquisite furniture, and the Song and Yuan Dynasties' Buddha statues are all made of tree roots. Root carvings from the Ming and Qing dynasties, such as the root carving "Eight Immortals Crossing the Sea" in Beijing's Palace Museum, are particularly beautiful. It has an extremely high level of craftsmanship, and the character image is extremely lifelike [27]. Root carving art uses the roots of natural trees as raw materials for artistic creation, transforming them into beautiful works of art. Figure 1 depicts the characteristics of root carving's artistic ecological aesthetics.

Different from painting and sculpture, which first have creative inspiration, carving then looks for appropriate means of expression, so as to form the artistic work from inspiration to form, and finally return to the creative process of image. Root carving art is a unique process from form to inspiration and then to image. The expression of its characteristics lies in the shaping of beauty. Beauty is a natural beauty, not a product of "humanization" [28]. Natural beauty is natural and spiritual. Similarly, incomplete beauty is also a characteristic. An excellent root carving art must be derived from unique root materials that can bring rich creative inspiration to artists [29]. Although beauty and ugliness are opposites, if ugliness can be brought into full play, it is also the soul of art that works, and an art work that can

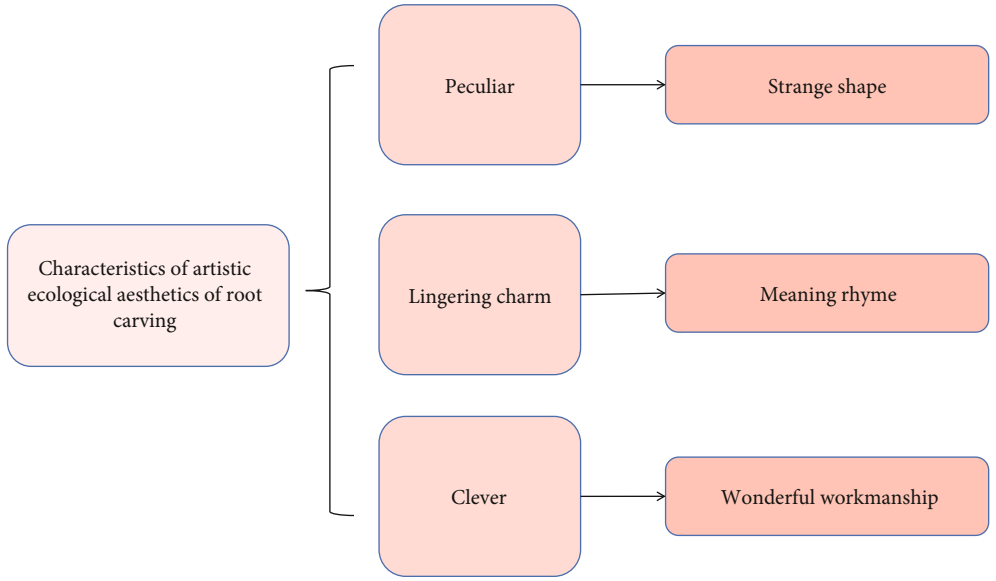

Figure 1: Characteristics of artistic ecological aesthetics of root carving.

attract appreciators is a good work. The formation of the strange shape of roots is related to the complex natural growing environment. In order to absorb and transmit nutrients to dry leaves, roots need to constantly adjust their growing direction due to the influence of many unstable factors such as soil, air, temperature, and climate, thus forming a disorderly and strange shape.

The root carving art carving method evolved primarily from the "natural carving method" in wood carving skills, and the root material's simplicity and naturalness are preserved as much as possible in the carving method. If the charm is the root's soul, then the peculiarity is the root's life. The essence of artistic creation is a creative activity in which form and spirit interact and transform. Charm is a perception from the soul that is contained in the external form of the root. Ordinary people consider ugly roots to be waste, but in the hands of artists, they can transform waste into treasure. The discovery and shaping of the beauty of the natural form of the root are the main aesthetic characteristics of root carving art. All things in nature have been deified and are worthy of observance and worship as a result of the ancients' awe of unknown forces. As a result, "skillful in nature" and "as in heaven" have become the pinnacle of artistic achievement, and root carving is no exception. Root carvings frequently elicit associations and elicit the evolution of emotion in ordinary, ugly, and simple forms, implying the initiation of beauty and power, and forming a kind of spiritual communication and collision between things and me. Excellent root carvings are frequently seen in the form of "Ugliness." They give emotional changes, combine the root with beauty, form the soul collision between the root and the artist, and form the so-called charm communication through the artist's Association.

The artistic process is the process of expressing artists' thoughts and emotions, and the process of artists' understanding and cognitive expression. Image is the window of life and soul of a work and the carrier of revealing ideological connotation. It is necessary to find out exactly the cutting point of standing up and expressing ideas, and show the intention trend in the heart, so as to achieve the artistic effect of "standing up to express ideas." Creation results are the materialization of artists' thoughts. Artistic conception beauty contained in works is the core of artistic creation. Harmonious artistic image can often show perfect artistic effect. Through artistic processing, the artistic conception of root carving work is beautiful, and the unrepeatable materials make the artistic conception of root carving works unique.

3.2. The Expression of Root Carving Art in Space. The expression forms of root carving art in space can be roughly divided into three categories: root carving art furniture, root carving art furnishings, and root calligraphy stickers. Thirdly, the knife technique contains two meanings, which refers not only to the method of the art creator to use the knife in the creative process but also to the method of shaping the root carving image with the knife. Different knife techniques can show different emotional colors and interests. For different tree roots, appropriate knife techniques are applied according to their shapes and themes. Root carving art display is the mainstream of root carving art. As a unique art in space, it can create an artistic atmosphere of space and present the meaning of the unity of heaven and man. Root carving art breaks the convention, integrates beauty and ugliness, and turns ugliness into beauty. It is an innovative spirit of art, which is worthy of promotion and praise.

Based on the difference of root image, choosing proper knife method reasonably can endow root with rich artistic features and show different aesthetic values. To express the weather-beaten face and simple and honest features of the elderly, square and rough knife methods can be used to form old-fashioned knife marks and blocks. When expressing the tenderness, smoothness and innocence of a child, you can

use the knife method of thin mouth to produce delicate knife marks and blocks. The last and deepest function of form is that it not only turns reality into emptiness, but also attracts people's spirit to fly over. It is opportune to select materials beyond the beautiful environment, and it is necessary to understand the inner meaning of root materials through the observation of artists. According to the peculiarity of the root material, the artistic value lies in exerting imagination and fully exerting the "ugly" state to the extreme. The naming of root carving works of art is very particular, because the naming of works of art is the embodiment of artistry and literariness, and it must be named around the artistic form and connotation of the works. The ingenious part of naming is that it is closely related to the conception and image of the work. Root carving works of art are all unique. When the appreciator feels the unique atmosphere emanating from the root art works in a specific space, and then generates emotions related to personal life experiences, they feel the unique artistic realm produced by the works. In today's increasingly developed aesthetics, there are irreplaceable laws and functions in the art of sound root carving.

Ordinary, unsightly root material can be considered a waste, but if you are good at finding it, it can turn into a rare, high-quality resource. On the one hand, the term "unique breath" refers to the combination of the morphological structure of root materials and the artist's spiritual perception; on the other, it refers to the objective material environment in which the root carving works are situated. The artistic conception is the result of combining the two. Root carving is a full combination of nature and the creator's emotion, with cleverness serving as the aesthetic appeal. Root carving as an artistic creation is in harmony with the natural form of roots, returning to the natural creation, returning to the roots, and inheriting traditional Chinese philosophy and culture as works of art. The intuitive manifestation of evaluating the artistic value of a work of art is accurately expressing thoughts and feelings through external images. A well-balanced artistic image can effectively convey the artistic effect. People's living environment, ideal life, artistic accomplishment, cultural connotation, and other factors may influence the aesthetic object they create—root carving art.

4. Texture Synthesis Algorithm and Analysis

4.1. Genetic Algorithm. Genetic algorithm (GA) is a general model of species evolution process imitating genetic theory. It is a global optimization algorithm derived from imitating natural evolution process. In the process of texture synthesis, the best matching block is searched by moving the template point by point. If the edges of B_1 and B_2 along the vertical direction overlap, the error surface is calculated as follows:

$$e = (B_1^{ov} - B_2^{ov})^2. \quad (1)$$

Genetic algorithm, as a novel random search and optimization algorithm, has the characteristics of adaptive search and global optimization and is widely used in various fields because of its simplicity, universality, strong robustness, and wide application range. The discrete method defines the texture in a two-dimensional array, which represents the texture values on a set of grid points with fixed row spacing and column spacing in the texture space. If the sample texture is another type of texture, then the size of the synthesis unit is not fixed. In the next step of texture synthesis, it is necessary to first establish the image pyramid and then optimize the similarity function by using the maximum expectation algorithm. The specific realization module is shown in Figure 2.

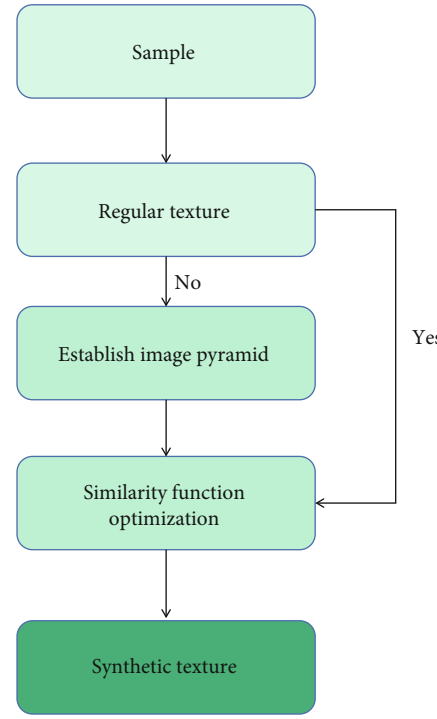

Figure 2: Texture synthesis framework.

The basic idea of genetic algorithm is to use the natural law of survival of the fittest. By means of the natural selection of species and the random search method of the reproduction system, all natural organisms compete for survival. Only those who adapt to the environment survive. The application scope of texture synthesis is relatively wide. Most of the texture synthesis is for the purpose of artificially generating textures. Through the synthesis and processing of related algorithms, a large area of scene details with the same visual effect can be generated. The purpose of this method is to minimize damage ΨB gradient information and adjust accordingly ΨB, so that the processed block ΨC and the whole image can be fused seamlessly. The algorithm is as follows:

$$\psi C(x, y) = \psi A(x, y), \forall (x, y) \in \partial B. \quad (2)$$

The observer can only see an image through the black box in the small movable window diagram. The observer can see different parts of the image when moving the window, whereas the texture image observation results are essentially the same. Texture mapping technology works well for expressing surface details and determining the

texture attributes of a specific point. However, because the sampling space is limited and the blocks used are small, mapping smaller samples to larger surfaces will produce fuzzier results. There will be a large number of seams and cracks if the mapping is repeated. The sum of squared error method is commonly used to calculate the difference between the subgraph and the template in the source image. The sum of squared errors of each pixel of the subimage and the template as a measure of similarity between the two is as follows:

$$D(i,j) = \sum_{x=0}^{X-1} \sum_{y=0}^{Y-1} \left[S^{i,j}(x,y) - T(x,y)\right]^2. \quad (3)$$

Genetic algorithm initially uses the gene coding method to map the solution space to the coding space. Each coding is a corresponding solution, that is, an individual or chromosome, and then arbitrarily sets the starting group of individuals, that is, the so-called population. According to different synthesis methods, texture synthesis methods can be divided into pixel-based texture synthesis, block-based texture synthesis, and optimization-based texture synthesis. According to different generation purposes, texture synthesis methods can be divided into constraint texture synthesis, video texture synthesis, dynamic texture synthesis, geometric texture synthesis, fluid texture synthesis, global change texture synthesis, and so on. In the subsequent evolution process, the algorithm follows the principle of survival of the fittest, screens individuals according to fitness values, and then makes individuals complete crossover and mutation by genetic operators, thus generating a population representing the optimal solution space, which will be more adaptable to reality than the previous generation, so that it will continue to multiply and stop when it reaches the optimization standard. At this time, the last generation of individuals pass the decoding, which is the approximate optimal solution of the problem.

Texture synthesis technology can overcome the shortcomings of traditional texture mapping methods, and avoid the cumbersome adjustment parameters of the process texture synthesis. Textures are classified into three categories according to the arrangement rule of texels or according to the arrangement rule of the smallest structural area composed of texels. The first type is structured texture, the second type is random texture, and the third type is semi-structured semi-random texture. Compared with common methods, the advantages of genetic algorithm are that it is convenient, robust, and does not require prior knowledge, which makes it applicable to many backgrounds and difficult problems. And usually the best answer is obtained. Using texture synthesis technology, texture filling (such as repairing damaged pictures, reproducing the original picture effect), texture transfer (pasting the texture of one image to another image), etc. It should be noted that in the process of texture synthesis, because of the diversity of textures and the complexity of human visual perception, our acquisition of texture features is often approximate. No mathematical model can accurately express all the features of texture, and no algorithm can extract all the features of texture. In the model-based point-to-point synthesis algorithm, it is necessary to compare the neighborhood error between the current pixel to be synthesized in the output result image and each pixel in the texture sample image, and randomly select one of the selected neighborhoods with small error as the matching neighborhood. This process is called neighborhood matching, and the pixel determined by neighborhood matching is called matching point.

4.2. Texture Synthesis Algorithm Based on Genetic Evolutionary Search. Genetic algorithm is a global optimization algorithm guided by the fitness function, which is used to search for the best matching block in the process of texture synthesis. The algorithm changes from the original point-by-point translation template to randomly selecting points to calculate, and through the generation-by-generation evolution of genetic algorithm, the corresponding fitness function will be used to guide the searching direction of the algorithm to the optimal point, which can reduce the computational complexity. When calculating the error between L-neighbors, the L_2 distance is used as the measure. The similarity between two neighbors N_1 and N_2 with the same shape is defined as the L_2 distance between them, namely,

$$d(N_1, N_2) = \sum_{p \in N_1, q \in N_2} \mathrm{sqrt}\left(f(p) - f(q)^2\right). \quad (4)$$

First, by changing the order of the error surface formula, a more accurate optimal cutting path can be obtained, so that the structural information can be better preserved during splicing. Through experimental demonstration and data analysis, it is shown that by increasing the order of the error surface formula, a more accurate cutting path can be obtained. Splice paths for better composite results. The specific PSNR value and SSIM value curve of the 30 frames of images, the image inpainting method based on the feature map of the texture synthesis algorithm based on genetic evolution search has improved both PSNR and SSIM. Figure 3 shows the comparison between the PSNR curve and the SSIM curve.

It can use texture to express the surface's many geometric details and illumination details, as well as the geometric shape of the object through deformation of the mapped texture. In texture space and surface parameter space, texture mapping can only be one-to-one mapped. A repetitive movement in nature, such as rhythmic music, repetitive dance movements of dancers, or various kinds of movements in nature, is referred to as texture. If no point with an error less than the given threshold value can be found after searching, the matching pixel with the smallest error is chosen and named Pbest. The principle of error matching is based on the following formula:

$$\mathrm{Error} = \sum_{i=1}^{n} \frac{1 - \partial_i}{n-1} \left(d(\mathrm{F}(q_i), \mathrm{F}(p) + d(\mathrm{F}(q_i), \mathrm{F}(t))\right). \quad (5)$$

Through the texture synthesis model of the texture synthesis algorithm based on genetic evolution search, we can

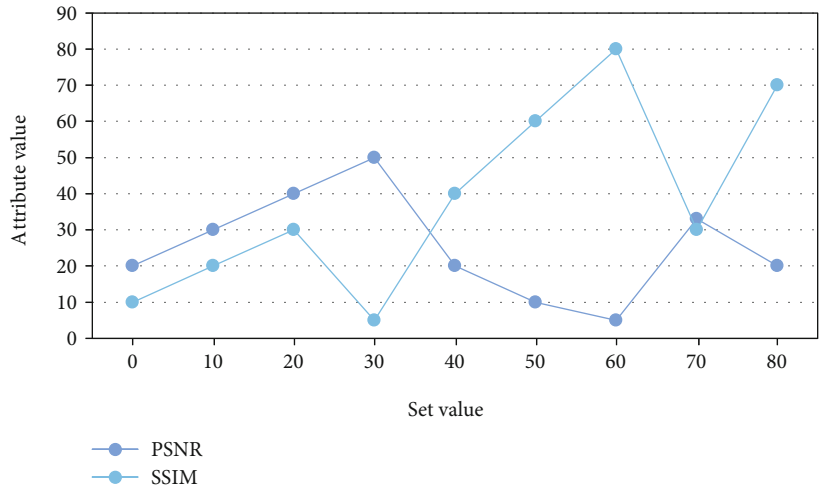

Figure 3: Comparison between PSNR curve and SSIM curve.

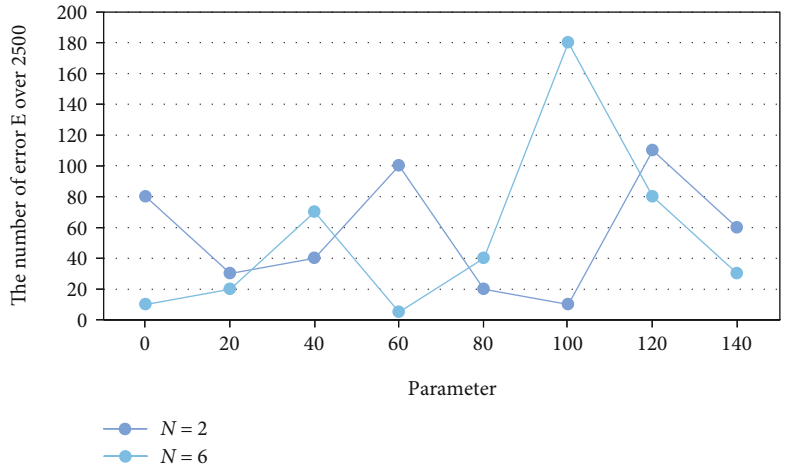

Figure 4: Number of errors exceeding 2500.

separately control the texture particles and texture layout in the synthesis process. The stability of the image means that under the premise of the appropriate size of the observation window, the part that the observer sees is always similar. The so-called locality of the image means that any pixel in the window can be predicted from the pixels in its surrounding neighborhood, regardless of the rest of the image. With the increase of N, the value of the error surface decreases, the smaller the error surface, the more accurate the boundary segmentation is obtained in the overlapping area between the two blocks. From the statistical comparison of the standard deviation of the error surface value, it can be seen that with the increase of n value, the SD value of the error value becomes smaller and smaller, indicating that the dispersion degree of the error value becomes smaller and smaller. Figures 4 and 5 show the number, standard deviation, and calculation time of error values exceeding 2500.

Parameter based texture synthesis is also called the process of generating texture based on physical model. It directly simulates the physical generation process of three-dimensional objects to synthesize specific surface textures, such as fluid image, cloth, wood, fur, transparent, translucent body and so on. The change mode of pattern element includes which factors in pattern element can change and how to change. The change range of pattern element is the quantitative scale of the change of changeable factors in fingerprint element. In the sample image texture synthesis based on block collage, the boundary of the texture block has an area with a certain width. Because only the texture block overlapping with the synthesized area at the boundary has discussion value in the synthesis process, the texture block boundary usually refers to the part where the texture block overlaps with the synthesized area. The main thing to consider when applying genetic algorithm to the actual texture synthesis problem is how to determine the genetic code and fitness function of the problem solution. The texture synthesis algorithm based on genetic evolutionary search can transfer the painting style of known samples to new instances. By generating the texture on each block, the characteristics of the global texture structure can be preserved. The boundary is determined according to the overlapping area of adjacent texture blocks, and the minimum error path of the overlapping area is found by dynamic programming method. It is the boundary of adjacent texture

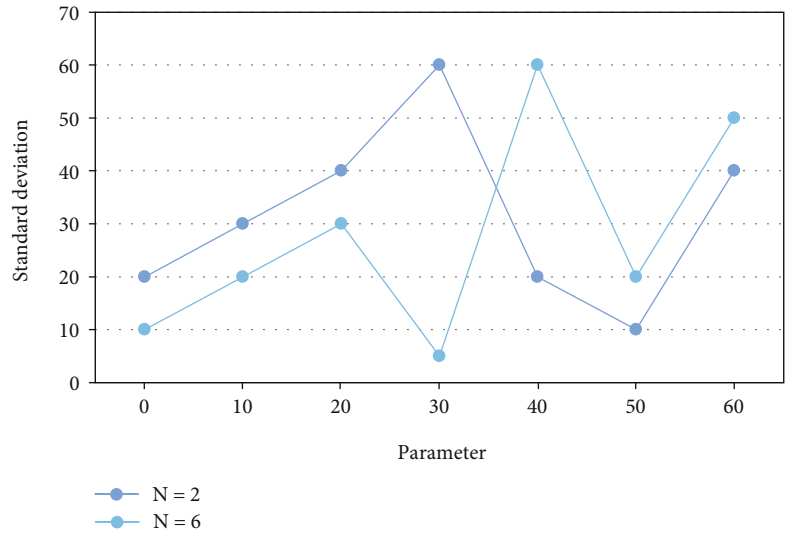

Figure 5: Standard deviation of error exceeding 2500.

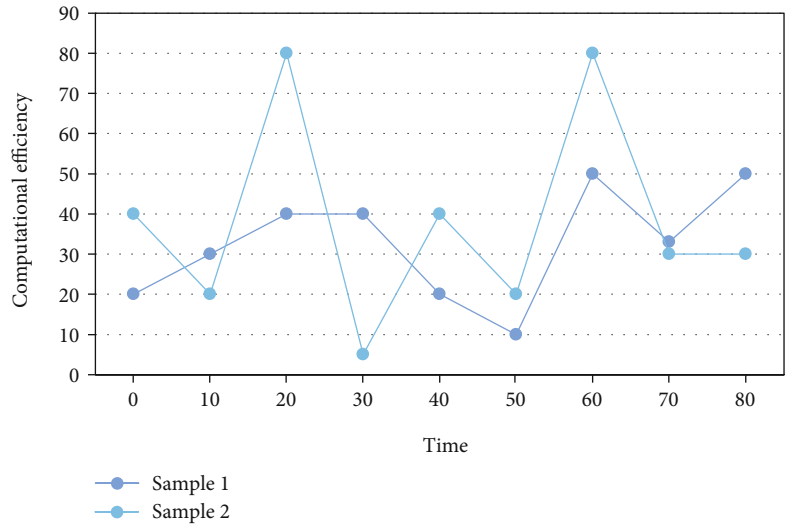

Figure 6: Texture synthesis result.

blocks, and good results are achieved in terms of synthesis quality and speed. From the time point of view, the running time of the original algorithm is obviously higher than that of the algorithm in this paper. When the genetic evolution search strategy is used to find the best matching block, the computational efficiency of the algorithm is improved. The results are shown in Figure 6.

In the texture synthesis algorithm based on genetic evolutionary search, the boundary error of each texture block in the texture sample image is calculated according to the current position of the texture block to be synthesized in the result image. One of the texture blocks to be selected with small error is randomly selected, and its boundary is the matching boundary. This process is called the boundary matching of the texture block, and the texture block determined by the boundary matching is called the matching texture block. According to the local characteristics of the texture, each pixel in the texture depends on its nearby points, and the nearby points largely determine the characteristics of the pixel. The nearby points here are the neighborhood of the pixel. The path with the smallest error is calculated by the following method: let B_1 and B_2 have vertical overlapping edges, and the error of each point in the last row of the overlapping area:

$$E_{i,j} = e_{i,j} + \min\left(E_{i-1,j}, E\right). \tag{6}$$

The texture analysis method of this algorithm is simple, which can keep the integrity of local information of the image well, and can achieve good results for most textures. The basic idea of the algorithm is to obtain candidate points according to the corresponding positions of the neighborhood points in the sample texture. The main function of fitness function is to compare the matching degree, so similarity measurement is an essential element. In order to

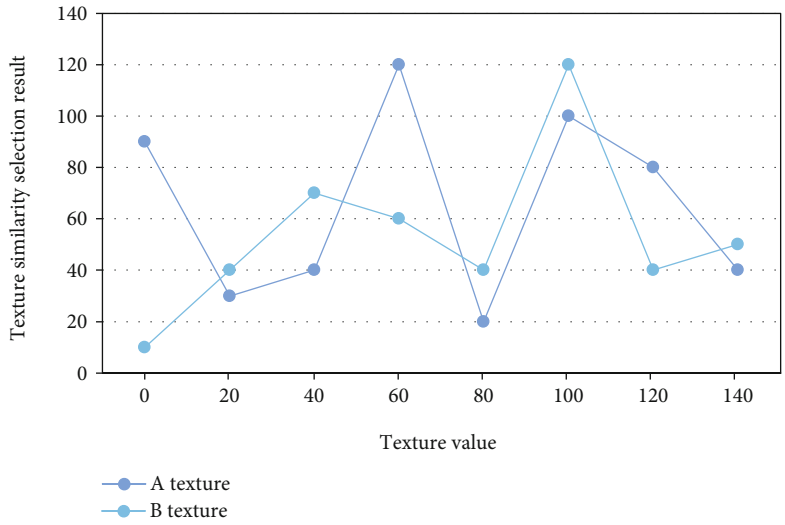

Figure 7: Tested texture similarity selection results.

analyze whether gender has a significant influence on global feature perception and local feature perception, we conducted an analysis of variance, and the results show that there is a significant difference between texture values and similarity selection results, as shown in Figure 7.

The algorithm has achieved good results in the synthesis of natural textures, such as grassland, sand and stone, but for textures with strong structure, the synthesis quality is not as good as the algorithm. The main reason is that the range of correlation measurement is too narrow, which limits the search range to the neighborhood of the current point. For many structural textures with obvious boundaries, the range of correlation measurement is relatively small. The algorithm uses multiresolution synthesis method to reduce the sampling range of the neighborhood, and speeds up the synthesis speed while retaining the original texture structure. Genetic algorithm is a novel random search and optimization algorithm, which has the characteristics of adaptive search and global optimization. By using genetic algorithm to find the best matching block, the search process of the algorithm is accelerated, so as to reduce the time required by the algorithm. Texture synthesis algorithm based on genetic evolution search can operate on many individuals in the population at the same time, that is, searching for points in the population instead of single points in a parallel way. In other common optimization methods, it usually follows some transformation criteria to move from one single point to another in the parameter area, so that it is easy to find a value that is not the highest in the whole, that is, the local best answer in the multipeak search range. However, the genetic algorithm searches synchronously in a parallel way, so it will avoid encountering the local optimal solution.

5. Conclusions

This paper begins with a discussion of the historical origins of root carving art, then examines its external aesthetic characteristics and internal spatial semantics. In order to inspire creative inspiration and determine the theme of the work, root carving artists must also go to nature to find, discover, and collect roots of various shapes. To find inspiration for artistic creation, you must be able to observe real life and natural ecology in detail and discover the beauty in life and nature from a unique perspective. Make an attempt to apply the mathematical morphology method to image perception. Deep learning methods of graphics, such as high-level semantic extraction and object segmentation, are widely used in image-processing work, with texture synthesis as the basic technology. However, many methods cannot be directly used in texture synthesis, and the traditional texture synthesis methods still have the problem of wrong large-scale structure texture output in the effect of synthetic texture. The effect of large-scale repeated texture synthesis for regular samples is not ideal. In order to improve the synthesis efficiency of block collage texture synthesis algorithm, an optimization search algorithm based on genetic evolutionary search strategy is used in the process of finding the best matching block. At present, the development of commonly used texture mapping technology is limited due to factors such as texture size and acquisition method, and it is easy to distort and deform the model surface after mapping. The requirements of large-scale scene rendering and graphics network transmission greatly promote the development of texture synthesis technology. Genetic algorithm is a random search optimization algorithm, which has the characteristics of self-adaptability to find the best option. It is often widely used in all aspects because of its simplicity, versatility, robustness, and wide application range. Texture synthesis technology has a wide application prospect in data compression, computer animation, virtual reality, digital image restoration, and so on. Genetic algorithm is used in finding the best image matching block in the process of texture synthesis, which can quickly complete the global search, greatly reduce the synthesis time, and improve the synthesis efficiency.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

The authors do not have any possible conflicts of interest.

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