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Research Article

Chinese Decorative Color Based on Improved AlexNet in Interior Decoration Design

Wei Lun Shan,[1] **Rong Mei Jin**,[2] **and Xian Yao Ding**[1]

[1]*Dong-eui University, Busan 47340, Republic of Korea*
[2]*DaLian University of Technology, DaLian 116024, Liaoning, China*

Correspondence should be addressed to Xian Yao Ding; z5331674@ad.unsw.edu.au

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Since the twenty-first century, with the improvement of China's comprehensive national strength and cultural confidence, our country has paid more and more attention to the protection and development of Chinese traditional culture, and more and more attention to the protection and development of China's traditional culture, traditional culture has no longer become a simple symbol in history books but has gradually entered people's daily life with the characteristics of vitality and gradually evolved into various characteristics and forms and integrated into all walks of life. Under the background of the evolution of this culture, this paper discusses the application of Chinese decorative color for interior decoration design and puts forward an application model of Chinese decorative color for interior design based on the AlexNet network improved by Adam, BN, dropout, and data enhancement optimization algorithm. Through analysis, it is found that the AlexNet network improved based on the above optimization algorithm has a good application prospect for interior decoration design. For the traditional AlexNet network, the improved AlexNet network is obviously better than the traditional AlexNet network in color extraction and can greatly reduce the loss value in the process of color recognition, up to 70.77%. Finally, the application forms and decorative functions of Chinese decorative color elements based on the improved AlexNet network in interior decoration design are analyzed. Relevant research can not only promote the integration of new and new technologies into traditional art but also effectively carry forward Chinese traditional culture and promote the internationalization of Chinese color.

1. Introduction

With the accelerated development of the industrialization process, the trend of urban construction has swept the country rapidly. Each metropolis is chasing each other, building large-scale buildings, building bridges, and roads. The quiet and elegant natural beauty of the past has been seriously damaged, and the Earth's ecological environment is getting worse and worse. Under the three "P" crises of "population explosion," "environmental pollution," and "resource depletion," interior design, as an important link in the relationship between man, society, and environment, should shoulder a new historical mission and take these three issues as factors that must be considered in the design. The future society must be a society of sustainable development. The design of sustainable development should be a design that has the ability to develop new and renewable resources, control the use of nonrenewable resources to a minimum, respect the design of nature and artificial environment, emphasize the harmony between man and nature, and emphasize the infiltration and integration of artificial environment and natural environment, which is the perfect embodiment of ecology [1, 2]. The ancient Chinese decorative color is the exquisite combination of man-made and nature. The central idea of all planning is to create a healthier and vibrant environment, a safer, effective, peaceful, and fruitful lifestyle; that is, the ancient Chinese philosophy of "the unity of heaven and man" [3, 4]. Natural spatial elements have created a harmonious ecological beauty, which has become a new development field of aesthetics. The interior decoration has existed since ancient times. From Banpo site of primitive society in China to Afang palace in

Qin Dynasty and Weiyang palace in Western Han Dynasty, the interior decoration at that time was quite fine and gorgeous. In foreign countries, ancient Greece and Rome have developed to a very high level in architectural art and interior decoration [5–8]. In 1890, candelswheeler published his first article entitled "interior decoration as a female profession," which contributed to the emergence of the industry called interior designer today. The publication of her book "high-grade room" has laid a foundation for the formation of the interior design industry since then. Since then, with the development and innovation of new concepts and concepts in the construction industry, the foreign interior design industry has formed a unique interior design style system [9–13]. China has also formed its own decorative design techniques and styles, forming a decorative style with Chinese local and national characteristics [14].

The environment similar to nature created by ancient Chinese interior decoration design gives people the beauty of returning to nature. It is more vibrant and full of vitality than ordinary handicrafts and enhances the sense of life of the internal environment with its unique natural beauty [14–17]. Its spiritual function is related to the psychological activities of "communication" and affects people's emotions. The relationship between man and nature is rest, which has become the subconscious need of people. It has become or is becoming a need to make up for the gap between modern urban housing and nature, increase people's opportunities to contact nature in high-rise housing and introduce ancient Chinese interior decoration colors. The indoor natural landscape is both derived from nature and higher than nature. It coordinates a series of contradictions between large and small, true and false, far and near within an appropriate range to achieve harmony between man and nature [18]. They often use the technique of "shrinking the Dragon into an inch, close to thousands of miles" to extract the mountains, peaks, valleys, cliffs, rivers and lakes, exotic flowers, and plants in nature. After artistic treatment and years of careful maintenance, they form a miniature reflecting various beautiful natural landscapes. They are big in small, true in false, far in near, and far in deep. Their artistic conception is detached, giving people the feeling of being in the real mountains and water. It is really called "within a short distance, thousands of miles away, within a square inch, and distinguishing the precipitousness of thousands of miles," so that people can fully enjoy the artistic beauty of harmony and unity with nature[8, 19, 20]. Human dependence on sunlight, air, water, and plants full of vitality has become the standard for designing indoor space environment.

Indoor natural landscape is included in the field of landscape ecology because of its unique ecological function. As a part of ecological architecture design, with the development of ecological architecture theory and technology, the trend of combining design with nature and ancient decorative colors is more obvious, which also provides theoretical guidance for interior design. However, the technology is still in the experimental stage, and the combination of design is relatively stiff and not harmonious. More and more designers are actively exploring an ecological design road that can meet the harmonious coexistence between man and nature [21–23].

This paper attempts to explore the relationship between the interior ecological landscape and interior decoration design by analyzing the relevant theories and design techniques and with the help of the improved AlexNet convolution neural network [24, 25]. The relationship between ancient Chinese decorative color and interior decoration design is not only a subordinate relationship, which should be paid more attention to because although the interior design is a plastic art activity, this kind of plastic art work should not only be through visual. We should also sense and experience through hearing and smell. Without the construction of an indoor ecological landscape, we can not perceive the natural flavor. Similarly, without the construction of an indoor ecological landscape, we will lack the flavor of life. Make the interior ecological landscape design and interior decoration design integrate each other in design ideas and design methods, so as to design and create both scientific and artistic; a modern indoor environment that can not only meet the functional requirements but also have a cultural connotation, people-oriented, emotional and rational [26–29]. Therefore, its research results will provide a reference value for getting rid of the shackles of inherent concepts such as the abuse of energy, the malpractice of excessive decoration, and the disregard of human care, building the future ecological building space, and creating a sustainable modern interior design style.

2. Interior Decoration Design and AlexNet Convolution Neural Network

2.1. Interior Decoration Design. Interior decoration design is divided into the following concepts: interior space, decoration, and interior design.

2.1.1. The Concept of Interior Space. Usually, we regard the interior of the building as the interior space, and the exterior of the building as the outdoor space. The interior space is composed of ground, wall, and roof. Japanese architect Yixin Luyuan made a conceptual definition for the internal and external space. He took the presence or absence of "top interface" as the main symbol to distinguish the internal and external space: all building spaces with roofs are regarded as indoor spaces, and all open-air building spaces are regarded as outdoor spaces. However, in the face of diversified contemporary architecture, this definition of interior space is not complete. If a complete indoor space loses some four sided interfaces, it will lose its "shell" to varying degrees, thereby weakening the indoor characteristics and increasing outdoor factors. Such space is the interior space with different degrees of "externalization." Similarly, if the outdoor external space is surrounded by different degrees of enclosure interfaces, the outdoor characteristics will be weakened and the indoor factors will be incorporated. Such a space is an outdoor space with different degrees of "Internalization."

Therefore, the interior space should not be a single limited concept of the top interface, and its boundary with the outdoor space is a fuzzy transition. The space with obvious internalization characteristics and a close relationship with the interior of the building can also be understood as interior space. Such an indoor space is determined by the following two aspects: the size of the space, the scale ratio of the enclosure interface, and the degree of integration of the enclosure space.

2.1.2. The Concept of Decoration. Decoration, as a special term commonly used in the field of art and covering a large amount, has a broad sense and a narrow sense. In English, the words related to the meaning of decoration, except for the word decorative art, the so-called decoration of other words can generally be divided into two categories. One category, such as decoration, mainly refers to the decoration phenomenon in a broad sense, and represents the decoration and decoration in the overall sense, such as all the designs and furnishings inside and outside the building; it refers to the narrow sense of decorative phenomena such as specific categories or individual ornaments, patterns and decorative patterns, which are generally expressed by ornament [18]. The modern Chinese Dictionary interprets decoration as something attached to the surface of the body or object to make it beautiful. If it is derived from architecture, it can be understood as "adding some ancillary things to the surface of the building to increase the beauty of the building." This is the most common and direct understanding of architectural decoration. According to this definition, architectural decoration is attached to the building surface, rather than the basic needs of the building. The purpose of additional architectural decoration is "beauty." If architecture is compared to music, architectural decoration is only the decorative sound of decoration, in order to make people's eyes feel happy, relax, and rest [8]. However, architectural decoration is not just something attached to the building surface. We understand it not only as an art but also as a cultural symbol. In essence, it expresses the nature, purpose, and use of the space environment and also shows the identity, status, and aesthetic taste of the users. Its content and themes focus on all aspects of human culture, including religion, folk custom, and superstition. It covers everything from people's daily production and life to their deep ideology. They are expressed in architectural decoration in different forms.

2.1.3. Interior Decoration Design. As an integral part of the architecture, "decoration and architecture are like the relationship between the flowers and leaves of trees and plants and their structures. It is a component of things rather than an additional part" [21]. It is also linked with building structure, materials, and functions to complete the design of the space environment. The interior decoration design is to grasp the space from the interior of the building, and according to the use of nature and environment of the space, use material technology and artistic means and other decorative techniques to create an internal space environment design of an ideal place with reasonable functions, comfort, and beauty, which meets people's physiological and psychological requirements, makes users happy and is convenient for life, work and study. In other words, interior decoration design is a form of space design, which is the improvement and recreation of the existing building interior space.

2.2. AlexNet Network Structure. AlexNet was first proposed by Alex Krizhevsky in 2012 and won the imagenet2012 image recognition challenge that year with great advantages. Since then, a convolutional neural network has developed rapidly in the field of image recognition. The network structure of AlexNet is shown in Figure 1. The network consists of 8 different layers, including 5 convolution layers, 2 fully connected hidden layers, and 1 fully connected output layer. The difference between this method and ordinary convolutional neural network is that the network activation function is changed from sigmoid to ReLu, which helps the neural network better solve complex nonlinear problems. At the same time, the local response normalization algorithm (LRN) is added after the pooling layer, and the dropout layer is added before the full connection layer is hidden, so as to improve the generalization ability of the whole network. This paper mainly optimizes and improves the normalization method, optimization function, and dropout layer in the AlexNet network structure [30–32].

2.3. Optimization and Improvement of AlexNet Network Model Algorithm

2.3.1. Adam Optimization Algorithm. The optimization algorithm plays a very important role in the training process of neural network. It aims to update and calculate the network parameters that affect the model training and model output, make them approximate or reach the optimal value and thus minimize the loss function. A good optimization algorithm can accelerate the convergence of the network model and avoid the influence of local minimum, saddle point, and so on. The most commonly used first-order optimization algorithm is the random gradient descent algorithm (SGD), which is also adopted by AlexNet, which speeds up the network update and reduces the operation cost of each iteration. However, this method is easy to deviate from the global best, fall into a saddle point, and the network training is not stable enough.

SGD is the most classical optimization algorithm. It calculates the error gradient of the parameters to be optimized in random samples and uses the error gradient to iteratively update the parameters to be optimized. The specific steps are summarized as the following three steps.

Step 1. Calculate the gradient of the objective function with respect to the current parameter.

$$g_i = \nabla f(w_i). \tag{1}$$

Step 2. Calculate the descent gradient.

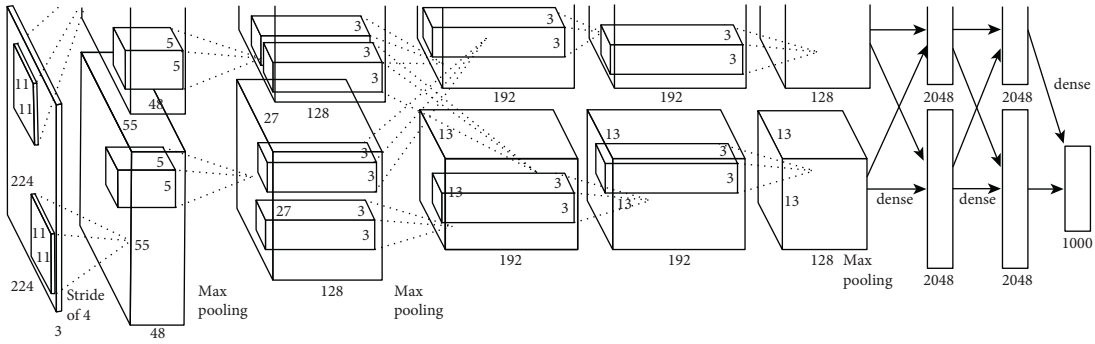

Figure 1: AlexNet network structure diagram.

$$\eta_i = \alpha \cdot g_i. \tag{2}$$

Step 3. Update the parameters according to the error gradient.

$$w_{i+1} = w_i - \eta_i, \tag{3}$$

where g_i is the gradient of the current parameter of the objective function; w_i is the parameter to be optimized; α is the learning rate.

Because the SGD algorithm only uses gradient for parameter optimization, it is easy to produce gradient oscillation, which is greatly affected by the training samples, and the convergence is unstable. For the data whose statistical characteristics are not obvious and the error surface is complex, the optimization effect is poor, and it is very easy to be affected by the saddle point or local optimum, resulting in the problem of slow convergence or no convergence.

Adam algorithm combines the ideas of SGDM and rmsprop. SGDM algorithm proposes to use the first-order moment to obtain the inertia holding, and rmsprop algorithm proposes to use the second-order moment to obtain the ability of environment perception. The steps of the Adam parameter update are summarized as the following four steps.

Step 4. Calculate the gradient of the objective function with respect to the current parameter.

$$g_i = \nabla f(w_i). \tag{4}$$

Step 5. Calculate the first-order moment and the second-order moment according to the historical gradient.

$$\begin{aligned} m_i &= \beta_1 \cdot m_{i-1} + (1 - \beta_1) \cdot g_i, \\ V_i &= \beta_2 \cdot V_{i-1} + (1 - \beta_2) \cdot g_i^2. \end{aligned} \tag{5}$$

Step 6. Calculate the descent gradient.

$$\eta_i = \frac{\alpha \cdot m_i}{\sqrt{V_i}}. \tag{6}$$

Step 7. Update parameters by using descent gradient.

$$w_{i+1} = w_i - \eta_i. \tag{7}$$

Since the first-order moment is introduced to add inertia, the cumulative empirical effect can be played to make the convergence direction deviate to the current downward direction while inheriting the previous cumulative direction, so as to reduce the oscillation of the gradient. The introduction of the second-order moment enables different parameters to adjust their learning rate according to the updated speed, further accelerate the convergence process and ensure the stability of convergence.

Therefore, this paper considers to replace the optimization function in the AlexNet network and adopts [7] Adam optimization algorithm to replace the SGD algorithm. The algorithm can calculate the adaptive learning rate of each parameter and has a better convergence speed. Due to parameter updating, it will not have a great impact on the loss function. It can effectively avoid the problem that the network cannot converge and reduce the impact of interference factors such as image color deviation.

2.3.2. Batch Normalization (BN) Algorithm. Local response normalization (LRN) creates a competition mechanism for local neurons so that the neurons with larger response values are larger and the neurons with smaller response values are suppressed, increasing the contrast between them and reducing the interference of noise information, so as to highlight local features and enable them to be expressed in the next layer. After introducing LRN into AlexNet, its accuracy is improved by 1%~2% [17, 21]. The calculation formula is as follows:

$$b_{xy}^i = \frac{a_{xy}^i}{\left(k + \alpha \sum_{j=\max(0,inn2)}^{\min(N-1,i+(n/2))} \left(a_{x,y}^j\right)^2\right)^\beta}, \tag{8}$$

where n is the number of channels, i is the position of the channel, x, y is the coordinate position of the point, $B = \{x^{(1)}, x^{(2)}, \ldots, x^{(n)}\}$ are superparameters, where n is the length of the neighborhood, α,β Is a self-determined constant, k to prevent the denominator from being zero.

However, with the development of time, people have found that the improvement of the LRN algorithm is very limited, and there has been a batch normalization (BN)

algorithm with better performance. Ioffe et al. Proposed that the BN algorithm can more effectively solve the instability in the process of parameter update iteration. This algorithm adjusts the output of the network by comparing the mean and variance of batch data, reduces data offset, and avoids the problems of gradient disappearance and gradient explosion. Improving the stability of the middle layer output value is conducive to training an effective depth network model. Therefore, this paper chooses to add a BN algorithm between the first layer and the second layer convolution layer and the activation function. Through practice, the BN algorithm can effectively accelerate the convergence of the model and improve the recognition accuracy of the model.

In Table 1, x represents a d-dimensional input data; B refers to batch data with quantity n; $y^{(i)}$ is the output after batch normalization; μ_B is the mean value of batch data; σ_B is the variance of batch data; $\widehat{x}^{(i)}$ is the result of $x^{(i)}$ standardization; where o is a small constant that ensures that the denominator is not 0; γ and β. There are two parameters that you can learn: stretch and offset.

The BN algorithm normalizes the data of a certain dimension in the batch, arranges the data into a unified interval, reduces the divergence of the data, speeds up the training convergence of the model, and makes the training process more stable. The normalized data can better avoid gradient explosion and disappearance. At the same time, batch normalization can play a certain role in regularization, and can replace dropout to a certain extent.

2.3.3. Dropout Regularization. After batch normalization (BN), the initialization weight falls inside the data, and the overfitting position is often outside the data boundary. Therefore, the BN algorithm can play a certain role in regularization, so the introduction of the BN algorithm can help to avoid overfitting to a certain extent. Therefore, the dropout layer in the network structure can be removed or a low drop rate can be used. After experimental verification, this paper removes the last dropout layer in the AlexNet network and interacts with the BN algorithm to improve the training speed of the model and ensure that the network model can be better fitted.

In this paper, the BN algorithm is added between the first two maximum pooling layers and the activation function to stabilize the data of the first two convolution layers. The whole network uses the Adam optimization algorithm and discards the last dropout layer. The improved AlexNet network structure is shown in Figure 2.

3. Classification and Application of Chinese Decorative Color Based on Improved AlexNet Network

3.1. Data Collection and Pretreatment. This study crawls Baidu pictures through Python crawler algorithm (https://image.baidu.com/) There are five categories of Chinese decorative color pictures with the keywords of "Chinese decorative color," "Chinese ancient decoration," "Chinese color" (Mint), "ancient decorative color" (Patchouli), and "ancient color" (Hedyotis diffusa). Each category selects 600 of them, a total of 3000 pictures to form the data set, of which 2400 are used as the training set, 300 as the verification set, and 300 as the test set, each accounting for 80% and 10% of the total number of images 10%, and the data set is named zgzssc. In order to solve the problem that the small number of samples in the data set zgzssc may affect the accuracy of training, the following three methods are proposed to increase and expand the data set zgzssc.

Table 1: BN algorithm.

Input: Small batch $B = \{x^{(1)}, x^{(2)}, \ldots, x^{(n)}\}$ composed of n samples	
Output: Vector y with the same dimension as input $y^i = BN(x^i)$	
Mean value of small batch data	$\mu_B = (1/n)\sum_{i=1}^{n} x^{(i)}$
Variance of small batch data	$\sigma_B^2 = (1/n)\sum_{i=1}^{n} (x^{(i)} - \mu_B)^2$
Standardization	$\dot{x}^{(i)} = (x^{(i)} - \mu_B/\sqrt{\sigma_B^2 + \varepsilon})$
After introducing learnable parameters	$y^{(i)} = \gamma \odot \dot{x}^{(i)} + \beta$

3.1.1. Horizontal Mirror Image. As shown in Figure 3, if the horizontal mirror point of the original point is calculated, according to the coordinate relationship shown in Figure 3:

$$\begin{cases} x_1 = -x_0 + w, \\ y_1 = y_0. \end{cases} \tag{9}$$

Therefore, it is expressed in matrix form as follows:

$$\begin{bmatrix} x_1 \\ y_1 \\ 1 \end{bmatrix} = \begin{bmatrix} -1 & 0 & w \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_0 \\ y_0 \\ 1 \end{bmatrix}. \tag{10}$$

3.1.2. Rotate. According to the principle of Figure 4, if point $A_0(x_0, y_0)$ rotates θ To point $A(x, y)$, the radius is r, and the coordinates of point $A_0(x_0, y_0)$ of the original image are

$$\begin{cases} x_0 = r\cos\alpha, \\ y_0 = r\sin\alpha. \end{cases} \tag{11}$$

The coordinates of the rotation to the new position $A(x, y)$ are

$$\begin{cases} x = x_0\cos\theta + y_0\sin\theta, \\ y = -x_0\sin\theta + y_0\cos\theta. \end{cases} \tag{12}$$

Expressed in the following matrix:

$$\begin{bmatrix} x \\ y \\ 1 \end{bmatrix} = \begin{bmatrix} \cos\theta & \sin\theta & 0 \\ -\sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} x_0 \\ y_0 \\ 1 \end{bmatrix}. \tag{13}$$

This example is to rotate θ clockwise. If you rotate counterclockwise, just set $\theta = -\theta$.

3.1.3. Add Noise. There are many algorithms for image noise enhancement. In this study, the additive zero mean Gaussian

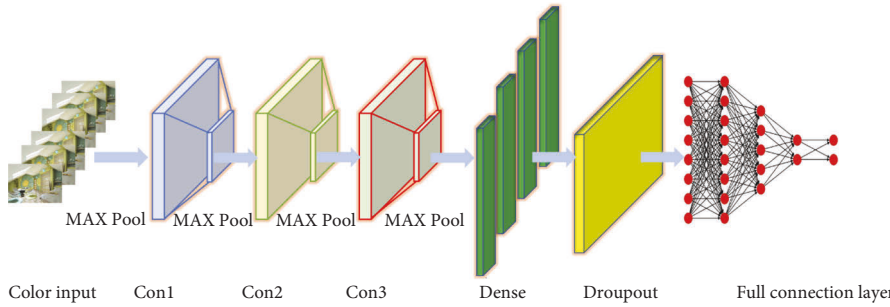

Figure 2: Structure diagram of improved AlexNet network (AlexNet En).

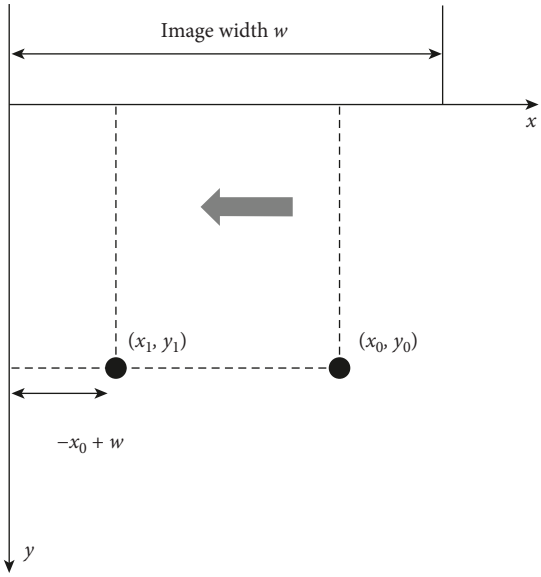

Figure 3: Horizontal mirror schematic.

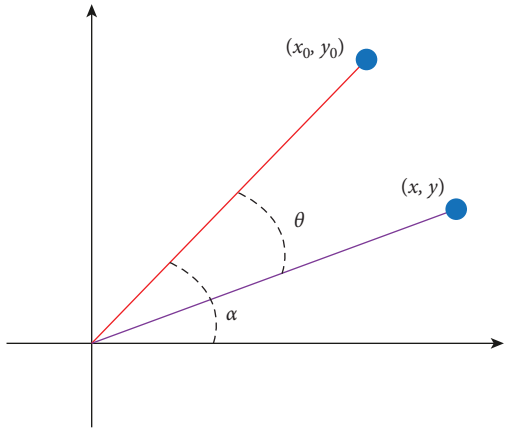

Figure 4: Rotation schematic.

noise method is used to add the corresponding noise to the image. The way to increase the noise is to add a noise value to the gray value of each point on the image. The way to generate the noise value is to use the box Muller algorithm to generate Gaussian noise. The box Muller algorithm generates two groups of independent standard normal distribution random variables X and y by using two groups of independent random numbers u and V uniformly distributed in the interval (0, 1]). Figure 5 shows the home decoration image of an ancient style mixed with Chinese color after noise enhancement using the box Muller algorithm.

The sample size of the data set amplified by the above three methods reached 12000, of which 9600 were used as training sets, 1200 as verification sets, and 1200 as test sets, accounting for 80%, 10%, and 10% of the total number of images respectively. The data set was named "Chinese decorative color expansion map" and recorded as "zgzssck."

3.2. Experimental Test. This experiment is based on the tensorflow2.0 platform. Tensorflow2.0 platform is a deep learning framework developed by Google formula, which supports command line, keras, and python interfaces. The framework uses matrix operation libraries such as matmul, matrixinverse, and matrixdeterminant to accelerate calculation and GPU acceleration. It has the characteristics of rich routine scripts and fast entry. The experimental software and hardware environment is Windows operating system, Intel Core i5 1.6 g GPU and 8 G memory. Four groups of experiments listed in Table 2 were carried out without considering the training time.

It should be noted that the default AlexNet model uses 1000 types of Imagenet data sets, while only 5 kinds of Chinese herbal medicine images are collected in this study. Therefore, it is necessary to modify the parameter num of each experimental model_ output = 5. In addition, during the training process, many tests found that the accuracy and loss value of each group basically stabilized after about 150 iterations. Therefore, Experiment 3 and Experiment 4 only analyzed the first 200 iterations, and Experiment 1 and Experiment 2 analyzed the complete 500 iterations. Figures 6–9 show the change curve of loss value during the four groups of experiments.

3.3. Analysis of Experimental Results. The experiment process can be divided into four groups: experiment 1, experiment 3, experiment 2, and Experiment 4 verify the influence of data expansion on the training results; experiment 1, experiment 2, experiment 3, and experiment 4 verify the impact of the improved AlexNet model on the training results. The statistical results of loss values of each group are shown in Table 3.

Figure 5: Home decoration drawing of an ancient style with Chinese color and the picture after noise enhancement.

Table 2: Experimental groups and setting information of each group.

Group	Data set	Network model	Iterations
Experiment 1	ZGZSSC	AlexNet	500
Experiment 2	ZGZSSC	AlexNet-en	500
Experiment 3	ZGZSSCK	AlexNet	200
Experiment 4	ZGZSSCK	AlexNet-en	200

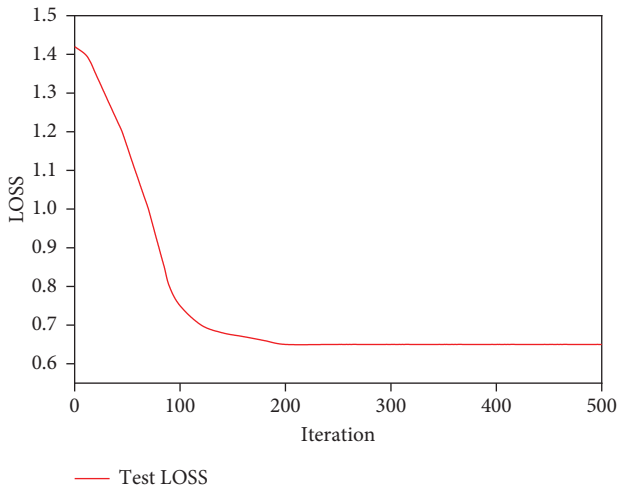

Figure 6: Experiment 1 test loss curve.

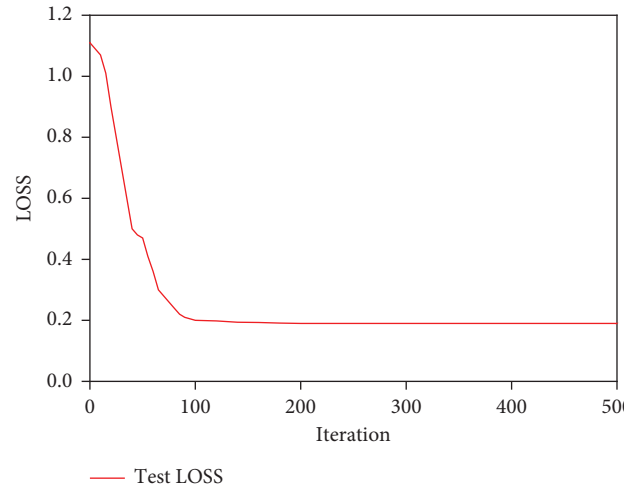

Figure 7: Experiment 2 test loss curve.

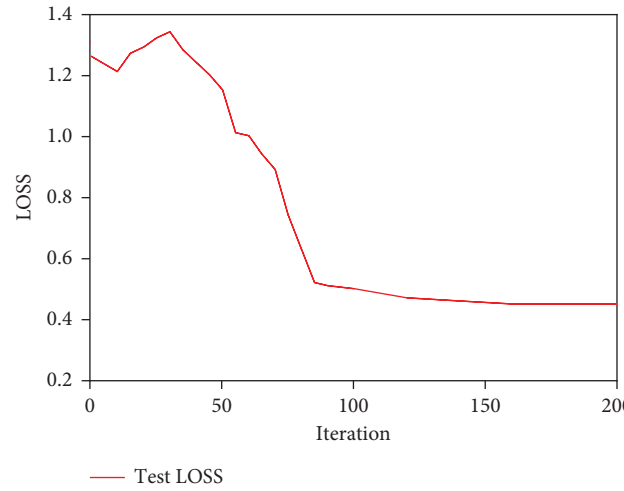

Figure 8: Experiment 3 test loss curve.

It can be found from Table 2 that data expansion can indeed reduce the loss rate in the training process. It can be verified from 0.65 in Experiment 1 to 0.45 in Experiment 3, and from 0.19 in Experiment 2 to 0.15 in Experiment 4. Secondly, in the improved AlexNet model, the training loss caused by data expansion is less than that caused by the original AlexNet model. The loss value from 0.65 in Experiment 1 to 0.19 in Experiment 3 decreased by 70.77%, while the loss value from 0.45 in Experiment 2 to 0.15 in Experiment 4 decreased by 66.67%, which was 0.16 less than the former and 4.1 less than the former. In addition, the loss values in the training process of Experiment 2 and Experiment 4 are lower than those in the training process of Experiment 1 and Experiment 3, respectively. Therefore, it can also be concluded that the improved AlexNet model can significantly improve the application ability of AlexNet model in interior decoration design, and improve the separation rate and matching degree of interior decoration colors. It can be found that the combination of data expansion and an improved AlexNet model can maximize the accuracy of image classification.

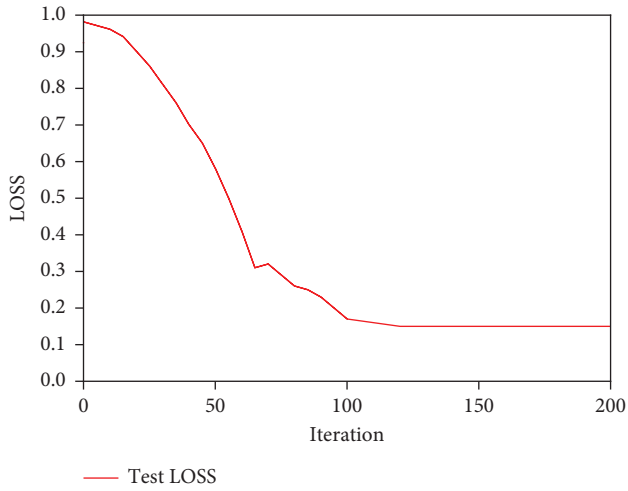

Figure 9: Experiment 4 test loss curve.

Table 3: Statistical results of different experimental loss values.

Item	Experiment 1	Experiment 2	Experiment 3	Experiment 4
LOSS	0.65	0.19	0.45	0.15

4. Application and Function Analysis of Chinese Decorative Color in Interior Design Based on Improved AlexNet Network

4.1. Application of Chinese Traditional Colors. The use of color in China has a long history, and the forms are more abundant and diverse. It can be seen from all kinds of art in ancient times that most of the works adopted the color expression form with Chinese characteristics developed from the basic color. For example, colored glaze yellow, rich purple, Chinese red, blue, and white these colors not only have the basic functions of color but also carry the traditional Chinese culture to a certain extent. When designing interior decorations (such as tapestries and Chinese curtain bedding), some or all of the traditional color elements of ancient China can be integrated into them, such as Chinese red and bright yellow. Through the collocation between these traditional colors and patterns, it can enhance the overall style and lasting appeal of the room. In the interior design of Chinese decoration, some tapestries and pillows with Chinese red as the main color are usually matched. The overall style is coordinated with Chinese decoration, giving people a luxurious and elegant feeling.

4.2. Effect of Chinese Color Integration

4.2.1. Improve Process Quality. Traditional techniques are also widely used, such as tie dyeing, embroidery, batik, and weaving. These crafts generally have strong national characteristics and cultural connotations, representing a period of history and a crystallization of wisdom. When using the improved AlexNet network to add Chinese traditional decorative color elements in modern interior decoration, it can be innovatively combined with color, pattern, and other forms and applied to some decorations with cultural characteristics and classical charm, such as bed curtains, tapestries, and bedding. Combine these traditional color process elements with modern bedroom environment design to enhance the overall design grade and soften the bedroom layout style. In addition, the design works can be enriched and vivid through the selection of multiple colors [29].

4.2.2. Integrate Indoor Space and Improve the Overall Style. Chinese decorative colors have the characteristics of soft texture and comfort. The innovative integration of Chinese decorative colors into modern interior decoration design based on the improved AlexNet network can play a role in softening the space and improving the overall style to a certain extent. At present, people try their best to reflect the sense of space and artistic style in the decoration of the bedroom. Adding textile decorative elements to the bedroom layout can alleviate the chill brought by reinforced concrete buildings and soften the overall space. In addition, the addition of Chinese decorative colors can not only enhance the artistic taste of space but also reflect its unique warmth retention, covering, and hue in some special elements (such as textiles). In particular, at present, many textiles incorporate a variety of Chinese cultural elements, mostly using natural materials such as cotton, hemp, and silk, which makes it easier to create a sense of nature and intimacy and enhance the overall softness and "cultural flavor" of the space.

4.2.3. Reasonably Divide the Space and Improve the Sense of Spatial Hierarchy. In addition to playing the role of soft space, Chinese decorative colors can also play a unique role in reasonably dividing space and improving the sense of spatial hierarchy. In the tough home decoration environment, Chinese decorative colors can divide different spaces into different functional areas. For example, you can choose carpets, draperies and other textiles with Chinese cultural characteristics to divide the space of different functional areas, which can not only make the room full of cultural atmosphere and improve the cultural pattern of the space but also avoid the cold and hard feeling of the room space as a whole and play a role of combining hardness and softness and clear hierarchy.

4.2.4. Render the Cultural Atmosphere of the Space and Add Aesthetic Interest. The last decorative function of Chinese decorative color in interior decoration is to render the cultural atmosphere of the space and add aesthetic interest. The interior decoration color integrated with Chinese cultural elements, whether from the perspective of color elements, pattern elements, cultural symbolism, and technological techniques, can give people the enjoyment of beauty. At the same time, the decorative color with Chinese cultural elements can also make the space full of cultural

flavor, and strengthen people's perception and resonance of aesthetics, so that the layout of the space is no longer simply based on various simple decorative styles, but increase the deep-seated connotation and increase the cultural sense and aesthetic interest through the embellishment of decorative textiles.

5. Conclusion

The Chinese culture has a long history, with rich artistic characteristics and spreading value. Alexnet has outstanding color blending ability, strong image color processing ability, and high application value. Nowadays, with the enhancement of China's cultural soft power and people's love for Chinese classical culture, more and more people are willing to participate in their daily life, including the use of ancient colors. The innovative integration of Chinese decorative colors with the improved AlexNet network into interior decoration design can not only improve the artistic taste of the room space, soften the feeling of space, and enhance the aesthetic taste but also provide an opportunity to carry forward China's excellent traditional culture. Therefore, this paper proposes an application model of Chinese decorative color for interior design based on AlexNet network improved by Adam, BN, dropout, and data enhancement optimization algorithm. After analysis, it is found that the improved AlexNet network based on the above optimization algorithm has a good application prospect for interior design. For the traditional AlexNet network, the improved AlexNet network is significantly better than the traditional AlexNet network for color extraction. And, it can significantly reduce the loss value in the process of color recognition, up to 70.77%. Through this study, we can learn that in the future interior design, we should follow the corresponding principles, pay attention to the use of artistic conception, and improve the inheritance of traditional decorative elements. At the same time, we should also give full play to the color integration ability of modern technology and the spatial decorative role of Chinese decorative colors, so that they can become the carrier of Chinese cultural symbols so that interior design can show Chinese style and be in line with international standards, Show the infinite charm of Chinese traditional culture.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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