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Retraction

Retracted: Material Analysis and Application Based on Intelligent Computing in the Context of Contemporary Watercolor Painting

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

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[1] J. Feng and Y. Zhang, "Material Analysis and Application Based on Intelligent Computing in the Context of Contemporary Watercolor Painting," *Security and Communication Networks*, vol. 2022, Article ID 9517615, 10 pages, 2022.

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Research Article

Material Analysis and Application Based on Intelligent Computing in the Context of Contemporary Watercolor Painting

Jianyu Feng and Yifei Zhang

School of Drawing and Painting, Luxun Academy of Fine Arts, Shenyang 110003, China

Correspondence should be addressed to Yifei Zhang; zhangyifei@lumei.edu.cn

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Scholars have researched the current situation and development trend of contemporary watercolor materials in terms of material intervention, material expression language, spiritual connotation in material "materiality," and practical application of materials, which are of profound significance to the consolidation of the theoretical system of watercolor painting in China. However, how to better analyze and apply watercolor materials on the basis of intelligent computing, as well as the material analysis and application based on intelligent computing in the context of contemporary watercolor painting, still has a lack of research at present. Therefore, this study considers the analysis and application of materials based on intelligent computing in the context of contemporary watercolor painting, in an attempt to seek ways to integrate with Chinese watercolor painting and its own national art.

1. Introduction

In the Chinese Encyclopedia, the definition of watercolor painting is as follows: "A painting made by mixing water and watercolor pigments. Watercolor painting emerged in Europe around the end of the 15th century, formed an independent genre in England after the 18th century, and was introduced to China in the early 20th century [1]. The famous English watercolor painters include J. M. W. Tanner and J. Constable. Famous Chinese watercolor painters include Guan Guangzhi, Li Jianchen, Ni Yide, Pan Sitong, Gu Yuan, and so on. Watercolor painting techniques include dry painting, wet painting, dipping, pointillism, rendering, and washing. With the help of water, watercolor painting expresses color intensity and transparency, using the masking and bleeding effect of white paper and pigment to reflect the unique artistic effects of brightness, transparency, lightness, moistening, and dripping" [2].

Watercolor painting is literally a painting made by using water as a diluent to mix colored pigments that can be diluted by water [3]. Nowadays, the number of materials used as diluent for painting is gradually increasing, and there are more pigments that use water as a diluent, such as acrylics, water-soluble colored pencils, and illustration ink. Thus, we have to re-examine the concept of watercolor painting [4]. Watercolor painting not only does refer to the use of water to mix pigments but also has its own rich connotation and a set of techniques that are very different from other types of painting [5]. The control of the amount of water, the ratio of water to pigment, and the traces left by water on the paper all become elements of the rhythm of the picture and its embodiment. From two or three hundred years ago to today, the concept of watercolor painting has expanded, with a more profound and extensive connotation and richer content, greatly expanding the previous meaning. Moreover, contemporary watercolor art creation not only adopts watercolor but also uses gouache, acrylic, Chinese painting pigments, and partially even oil paints, fluorescent paints, textile fiber paints, oil sticks, paints, etc. There are also cases where several pigments are used in combination.

Watercolor has been developed in China for more than two hundred years, and the process has been influenced by the traditional Chinese concept of painting, forming a unique Chinese artistic landscape. In contemporary research on the Chineseness of watercolor painting, the issue of the material language of painting has been of great concern. As various new materials have been explored and used, at the same time, traditional Chinese ink painting materials are familiar to Chinese painters, and they often apply traditional ink materials in their watercolor creative practice [6]. Painting materials are not only an expression of the medium of painting but also an artistic language. In particular, certain watercolor synthesis materials, with their own physical qualities, can highlight the spirit of Chinese aesthetics, and their own artistic values are constantly being explored, which can constantly renew our way of thinking and nourish our aesthetic sensibilities.

Since the introduction of watercolor into China, artists have never stopped exploring the relationship between watercolor and traditional ink. Watercolor painting from the West and Chinese ink painting are constantly colliding and merging conceptually, and Chinese watercolor painting naturally draws on watercolor painting materials in terms of material language. At this time, the material language was not limited by the boundaries of the painting genre but used watercolor as a vehicle to use materials according to the needs of the picture and the artist's spiritual needs. The creators kept experimenting and breaking through the use of comprehensive materials, making new breakthroughs in the language of watercolor materials while drawing on traditional Chinese painting. It is worth noting that the innovation of Chinese watercolor painting in terms of materials should, on the one hand, preserve the original language of watercolor and, on the other hand, draw nutrients from the excellent Chinese traditional culture to reflect the national characteristics and artistic values of Chinese watercolor [7].

2. Related Work

Materials, in our life, are everywhere. In the creation of watercolor, material analysis directly reflects the state of mind and thoughts of the creator. The analysis of painting materials is highly dynamic and contains a spiritual dimension itself, so that the painting materials are given more and more profound meanings, and their connotations and extensions are more colorful. Otieno Redon said, "Materials have their own secrets to show, they each have their own characteristics, and the wise man speaks through them." It is important to have a correct understanding of the material analysis of the painting. In fact, the creative potential of watercolor material analysis is huge, because watercolor creation is mainly a combination of water and various integrated media, which has infinitely extended expressive tension in addition to its unique natural properties. Chen Xinmao believes that material analysis cannot be regarded as a simple technique but as a specific form of expressing the spirit through the comprehensive use of various materials.

According to [8], "painting is not simply a patchwork of art forms, let alone an attempt and innovation of techniques, but a specific manifestation of the visual requirements and ideological content of painting under the inspiration of a specific artistic spirit, which can be the use of the popular media materials of the moment, or the sum of multiple painting materials, generally and usually created within the context of specific ideological content and the painter's personal freedom of thought."

Watercolor materials themselves have certain limitations, so contemporary watercolor borrowing material analysis from Chinese ink painting is still one of the ways to effectively realize the Chinese-ness of watercolor painting. The development of watercolor material analysis cannot be satisfied only by its own inherent and monotonous attainments [9]. In addition, watercolor materials have their own material properties, which have the characteristics that they should not be covered or modified.

Material analysis is one of the important ways to express the spirit of traditional Chinese aesthetics. The study in [10] on The History of Chinese Watercolor Painting argues that the development of watercolor painting with national characteristics can be found in the tools of traditional Chinese painting materials, with the purpose of drawing on the aesthetic spirit and aesthetic style in the profound Chinese traditional art. The study in [11] argues that material analysis is, more importantly, representative of China's cultural heritage and national spirit. The study in [12] on "Transcending Again in Innovation" argues that from the actual achievements of China's previous watercolor painters, besides the material technique expression form, it is the expression of traditional cultural heritage that is the most important, so we should pay attention to the profound influence of traditional Chinese painting on watercolor. Watercolor painter Mr. Huang Tieshan said, "Chinese watercolor painters must work hard and learn to integrate traditional Chinese ink painting materials in addition to mastering the material techniques of Western watercolor painting, so as to build up Chinese watercolor painting with national spirit and artistic infectiousness, which is the road of future development of Chinese watercolor painting."

The art of painting is the expression of the deepest inner world of the mind, the catharsis and outburst of the artist's emotions, and thus, "one cannot talk about the meaning of art without its material existence in the world." From this, it can be seen that the creation of painting cannot be separated from its closely related material existence, i.e., painting materials. The use of traditional watercolor materials has evolved over time and with the history of watercolor painting.

Painting materials are the material existence of watercolor creation, and they are also the prerequisite preparation and material foundation for watercolor art creation, directly and profoundly reflecting the artistic thinking, emotional expression, and aesthetic style of the painter's works [13]. Painting materials are often used passively and mechanically, but in today's watercolor creation, the material speaking the power of media materials gradually increases and begins to rise to a height of consciousness with cultural carrier value and aesthetic properties [14].

Watercolor painting material is the aesthetic carrier for the watercolor artist to express his own thoughts and feelings, a material need for spiritual catharsis, and a cultural carrier and aesthetic experience for the spiritual monologue to be realized [9]. The painting material is a natural and unnatural release of the artist's emotions and expressions and his or her deep feelings about everything in the world. It can be seen that the relationship between the creation of watercolor painting and materials is extremely close, and the two are interdependent, mutually reinforcing, and indispensable.

"From the perspective of the development of material media, the evolution of human art can be divided into the period of natural materials and the period of artificial materials [15]." Natural materials refer to the almost unprocessed painting materials used by the ancient ancestors when they used natural mineral pigments such as natural loess, red clay, black charcoal of burnt wood, and primitive plant pigments such as stems and leaves of plants to depict totem-like animal images, and the ancient art painted at this time can be said to be the germination of watercolor painting [16]. This natural material is simple, clumsy, and rough and maintains its original character. The art of the ancient period takes natural material as the material premise, and the artistic expression is drawn by natural factors, with a single form of subject matter and relatively poor language.

Gradually, as the production of painting materials and art production began to be separated, artificial materials gradually entered people's attention. Until the eighteenth century in Europe, watercolors were only available in a few varieties, such as brown and blue [17]. In the mid-eighteenth century, artists began to use special semi-mechanical, semi-manual ground pigments contained in pig bladders. It was not until the end of the nineteenth century that painters began to use man-made pigments packaged in ready-made tin tubes. In the early twentieth century, watercolor painting was introduced to China, and the traditional watercolor painting began [18]. The achievements of painting and the diversity of art forms to date are inextricably linked to the evolution of materials. The materials used in the creation of traditional watercolor paintings in China are simple, and the varieties of materials are not that complicated [19]. The traditional materials used in the creation of watercolor paintings are classified as follows: watercolor paper, watercolor brushes, watercolor paints, mediums, and other auxiliary tools. In short, the traditional materials used in watercolor painting include five major categories, namely, paper, brush, color, water, and other auxiliary tools.

All in all, since material analysis is one of the important ways to express the traditional Chinese aesthetic spirit, it becomes the focus of this study to strengthen the material analysis and application of intelligent computing in the context of contemporary watercolor painting.

3. Methods

The development of today's watercolor painting itself is complicated and difficult. The exploration of traditional watercolor language can be said to have reached a certain level, but due to certain traditional restrictions of stereotypes, the art language form is conservative and single. The stubborn insistence on the purity of the so-called art language has circled the development space of watercolor art. While the original language of watercolor should continue to be constructed, it is worthwhile for us to think about the possible development direction of watercolor art in the future and to explore the space for the improvement and extension of the language. When the traditional art materials of the genre itself cannot meet the needs of the art environment, the art genre itself, and the artist's inner spiritual state, they will gradually turn to the direction of exploring new possibilities of using different materials to assist in the painting. The exploration and use of materials is not a blind move to develop watercolor art, but more a result of our spiritual needs.

"Nowadays, the transformation of cultural forms has become the theme of history, the old laws have been broken again and again, and the diversification of cultural dynamics has been in full swing. As a result, the original materials have become a kind of confinement, and the prosperity of art has brought about the diversification of art media as a matter of necessity, and non-traditional materials have also shown exceptional vitality because they carry a new atmosphere of the times. China's artistic achievements have today's brilliance, which is inseparable from the successful experience and fruitful results of a considerable number of artists in the application of materials." Watercolor painting and painting materials are closely related, and the breakthrough use of comprehensive materials in watercolor painting gives freedom to artists and appreciators, bringing more uncertainty and greater, unknown and unforeseen potential possibilities to watercolor art. The following is a representative list of comprehensive materials that can be used to assist in the practice of watercolor painting.

Special materials for the paper include canvas for watercolor, white cardboard, rice paper (collage), cotton cloth, wood board, vellum, and clay (paste), as shown in Figure 1.

Special materials for pens include mops, row brushes, pens, water pens, water-soluble colored pencils, oil sticks, gouache, oil pastels, brushes, and colored pastels, as shown in Figure 2.

Special materials for color include textile fiber pigments, fluorescent pigments, sequins, gold and silver, pearl powder, and paint, as shown in Figure 3.

Special materials for media are shown in Figure 4.

Other special materials for auxiliary tools include white glue, transparent tape, toothpick, tissue paper, curtain, sponge, fixing liquid, paste, framing, charcoal powder, plaster liquid, and cotton ball, as shown in Figure 5.

Special materials for other methods of media include projectors, digital cameras, electric heaters, electric drills, wind turbines, and computer Photoshop design software, as shown in Figure 6.

Let the number of watercolor painting materials consumed in the calendar year be in the order $y_1, y_2, \ldots, y_T$; α is the weighting factor:

$$\hat{y}_{t+1} = S_t^{(1)}. \quad (1)$$

Here, $S_t^{(1)} = \alpha y_t + (1-\alpha) S_{t-1}^{(1)}$. denotes an exponential smoothing value for a period $t\,(t = 1, 2, \ldots, T)$.

Definition of initial value: if the number of samples is greater than, for example, $n \geq 20$, and if the initial value is less

FIGURE 1: Watercolor paper, white cardboard, rice paper, cotton cloth, and wooden boards.

FIGURE 2: Painting document, water-based document, pen, mop, oil painting stick, and water-soluble color pencil.

FIGURE 3: Dope-dyed fiber colors, gold color and silver color, sequins, fluorescent pigment, and acrylic colors.

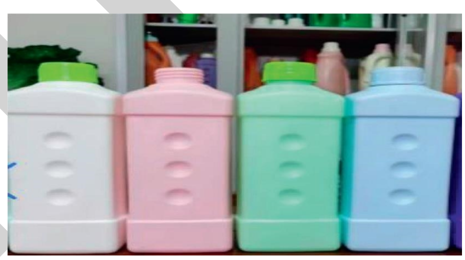

FIGURE 4: Bottle medium as an example.

FIGURE 5: Variety of auxiliary tools.

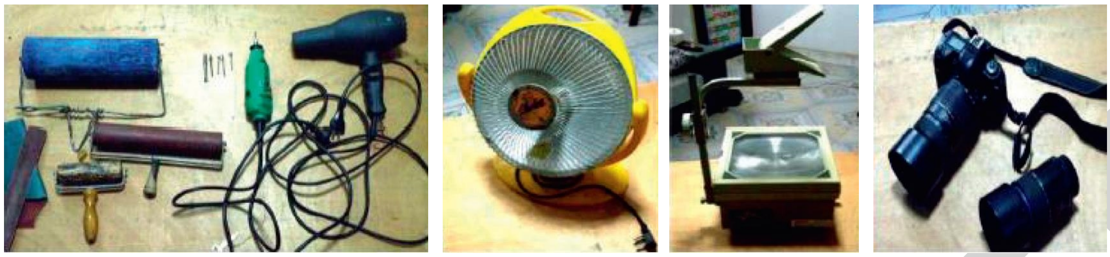

FIGURE 6: Electric hair dryer, electric drill, electric heaters, projection machine, and digital cameras.

than the subsequent value, the first data can be selected as the original data, i.e., $S_0^{(1)} = y_1$. If the number of educational samples is small and the initial value has a great impact on the subsequent values, the average of the actual data in the first two cycles can be selected as the initial value $S_0^{(1)} = (y_1 + y_2/2)$.

Definition of weight coefficient: if the main trend in the known data is stable and the fluctuation range is small, the value of the weight coefficient should be small, for example, $\alpha = 0.2$. If the known data is more unstable, the data should be increased, for example, $\alpha = 0.8$, to make the model more sensitive. If there are few known data, multiple values can be calculated separately, and the smaller root means square error value can be selected as the actual weight coefficient.

Let $X^{(0)}$ be the GM(1, 1) modeling sequence.

$$X^{(0)} = \left(x^{(0)}(1), x^{(0)}(2), \ldots, x^{(0)}(n)\right). \tag{2}$$

$X^{(1)}$ is the 1-AGO sequence of $X^{(0)}$.

$$\begin{aligned} X^{(1)} &= \left(x^{(1)}(1), x^{(1)}(2), \ldots, x^{(1)}(n)\right), \\ x^{(1)}(k) &= \sum_{i=1}^{k} x^{(0)}(i), \quad k = 1, 2, \ldots, n. \end{aligned} \tag{3}$$

Let $Z^{(1)}$ be the sequence of immediately adjacent mean generators of $X^{(1)}$.

$$\begin{aligned} Z^{(1)} &= \left(z^{(1)}(1), z^{(1)}(2), \ldots, z^{(1)}(n)\right), \\ Z^{(1)}(k) &= 0.5x^{(1)}(k) + 0.5x^{(1)}(k-1). \end{aligned} \tag{4}$$

Here,

$$\begin{aligned} B &= \begin{bmatrix} -z^{(1)}(2) & 1 \\ -z^{(1)}(3) & 1 \\ \vdots & \vdots \\ -z^{(1)}(n) & 1 \end{bmatrix}, \\ Y &= \begin{bmatrix} x^{(0)}(2) \\ x^{(0)}(3) \\ \vdots \\ x^{(0)}(n) \end{bmatrix}. \end{aligned} \tag{5}$$

Then, the gray system values are as follows:

$$\hat{x}^{(0)}(k+1) = x^{(1)}(k+1) - x^{(1)}(k), \tag{6}$$

where

$$\begin{aligned} \hat{x}^{(1)}(k+1) &= \left(x^{(0)}(1) - \frac{b}{a}\right)e^{-ak} + \frac{b}{a}, \\ \begin{pmatrix} a \\ b \end{pmatrix} &= \left(B^T B\right)^{-1} B^T Y, \\ B &= \begin{bmatrix} -z^{(1)}(2) & 1 \\ -z^{(1)}(3) & 1 \\ \vdots & \vdots \\ -z^{(1)}(n) & 1 \end{bmatrix}, \\ Y &= \begin{bmatrix} x^{(0)}(2) \\ x^{(0)}(3) \\ \vdots \\ x^{(0)}(n) \end{bmatrix}. \end{aligned} \tag{7}$$

Let x be the independent variable and y be the dependent variable, and there is some linear relationship between y and x. Then, the univariate linear regression equation is

$$\hat{y} = a + \hat{b}x, \tag{8}$$

where

$$\begin{aligned} \hat{b} &= \frac{n\sum_{i=1}^{n} x_i y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{n\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2}, \\ \hat{a} &= \overline{y} - \hat{b}_{\overline{x}}. \end{aligned} \tag{9}$$

We used input matrix, output matrix, coupling matrix between the input layer and hidden layer, coupling matrix between the hidden layer and output layer, output waiting matrix, the number of neurons in the input layer, the number of neurons in the hidden layer, and the number of neurons in the output layer. The formula for determining the optimal number of neurons in the hidden layer is

$$j = \sqrt{i + k} + a, \tag{10}$$

where a is a constant between 1 and 10.

They have their own advantages and disadvantages and are interrelated and complement each other. Different methods of using different data and obtaining information are different. If an error occurs during direct deletion, useful information may be lost. If different methods and information provided in different ways are used to optimize the combination of different methods, the accuracy can be greatly improved. The combination of the new model is optimized in the form of a combination model.

Let x_i be the weighting factor of the i-th method, Y_{it} be the value of the i-th method in year t, and Y_t be the value of the combined method in year t. Then, the objective function of the combined model is given as follows:

$$\text{Min}\, Z = \frac{1}{n}\sum_{t=1}^{n}\left(\sum_{i=1}^{N} x_i Y_{it} - y_t\right)^2, \tag{11}$$

where N is the number of selected single methods.

The most important thing is to determine the weight coefficient to make the result of the combined model more accurate. When determining the weighting coefficient, it is important to ensure that all methods are related to one weighting coefficient, that is, all methods are related to one weighting coefficient. This paper uses genetic algorithm to solve the model, the next step of the genetic algorithm.

The first step is to set parameters. The population number of this paper is 200, the hybridization probability is 0.6, the mutation probability is 0.001, the evolution rate is 600, and the substitution rate is 0.9.

Secondly, we use numeric encoding to generate the initial total number and use the length of a single encoded string as the number of a single method.

The third stage calculates the overall adaptation according to the selected adaptation function. Since the objective function of the combined model is a minimum problem, the minimum problem must be transformed into the maximum problem when determining the fitness function of genetic algorithm.

Fourth, according to the degree of adaptation, a new generation of population formation operation with selectivity, crossover, and variability is carried out in the genetic space.

Finally, we return to step 3 until the predetermined evolutionary algebra is reached and finally get the combination of model weight coefficients.

4. Experiments

In order to comprehensively evaluate the accuracy of the combination model established in this paper, according to the principle and practice of combination efficiency evaluation, at least three error characteristic indexes are generally used to comprehensively evaluate the error and the group with the smallest error is selected as the optimal combination model. This paper mainly uses the following three index error characteristics to evaluate the model:

Table 1: Watercolor painting materials in China (million t).

Year	Raw iron ore volume	Year	Raw iron ore volume
1992	21022	2001	21701
1993	22599	2	23143
1994	25056	2003	26139
1995	26210	2004	34634
1996	25228	2005	42049
1997	26699	2006	58888
1998	24689	2007	70665
1999	23723	2008	82401
2000	22256	2009	88122

(1) Squared sum error (SSE):

$$E_{\text{SSE}} = \sum_{t=1}^{n}\left(y_t - \hat{y}_t\right)^2. \tag{12}$$

(2) Mean squared error (MSE):

$$E_{\text{MSE}} = \frac{1}{n}\sum_{t=1}^{n}\left(y_t - \hat{y}_t\right)^2. \tag{13}$$

(3) Theil IC:

The value of Theil's inequality coefficient is usually between 0 and 1, and the smaller the value, the better the fit.

$$\text{Theil IC} = \frac{\sqrt{(1/n)\sum_{t=1}^{n}\left(y_t - \hat{y}_t\right)^2}}{\sqrt{(1/n)\sum_{t=1}^{n} y_t^2} + \sqrt{(1/n)\sum_{t=1}^{n} \hat{y}_t^2}}, \tag{14}$$

where y_t is the value of consumption in year t. $\hat{y}_t$ is the real amount of consumption in year t. n is the number of samples.

We selected China's watercolor painting material data, used intelligent computing algorithm-based analysis model, and established time series analysis model for watercolor painting material analysis; the sample data are shown in Table 1.

Prior to the training of the analytical model based on intelligent computing, the sample data is processed and normalized in this study using the following approach.

$$\begin{aligned} x_i^{*P_i} &= \frac{x_i^{P_i}}{x_{i,\max} + x_{i,\min}} \quad (i = 1, 2, \ldots, n), \\ o_j^{*P_i} &= \frac{o_j^{P_1}}{\mathbf{o}_{j,\max} + o_{j,\min}} \quad (j = 1, 2, \ldots, n). \end{aligned} \tag{15}$$

The minimum and maximum values of the i-th input in the sample input data are $x_{i,\max}$ and $x_{i,\min}$; the minimum and maximum values of the j-th learned output are $\mathbf{o}_{j,\max}$ and $o_{j,\min}$; the i-th input and j-th learned output of the P_1 th sample in the original data are $x_i^{P_i}$ and $o_j^{P_1}$; and the i-th input and j-th learned output of the P_1 th sample after processing are $x_i^{*P_i}$ and $o_j^{*P_i}$.

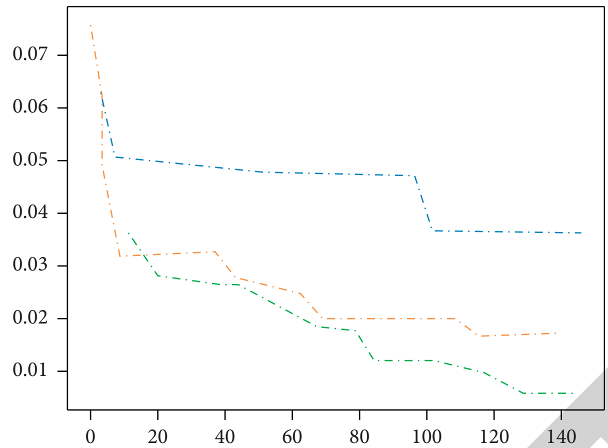

Figure 7: Optimization ship F network minimum error evolution curve.

Table 2: 2007–2009 domestic watercolor painting materials and analysis value comparison (million t).

Year	True value	RBF predicted value	Relative error (%)	DAPSO-RBF predicted value	Relative error (%)	SPSO-RBF predicted value	Relative error (%)
2007	70669	74265	5.12	72145	2.12	73382	3.86
2008	82405	86295	4.73	81689	0.85	79338	3.70
2009	72127	84545	4.08	86597	1.71	85491	3.01

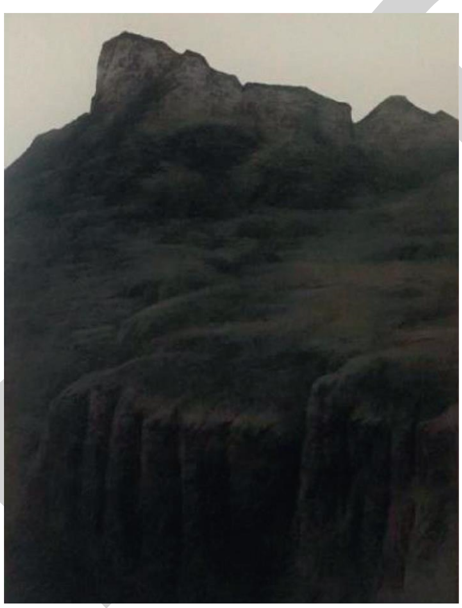

Figure 8: Taihang Mountain Series.

Figure 9: Laoshan Series.

The data of the first 5a is used as input for the analysis during the experiment, and the data of the 6a is analyzed. After a lot of experimental comparisons, the number of radial basis function centers of the hidden layer of the network is taken as 15, which is better, so the structure of the network is 5-15-l. Thus, there are 13 sets of sample data: the first 10 sets of data are used as training samples, while the last 3 sets of data are used as test samples; the parameters of the algorithm are $c_1 = c_2 = 2.0$, and the maximum number of iterations is 150, respectively. The minimum error evolution curve of the network during the optimization is shown in Figure 7.

From Figure 7, it can be seen that with the intelligent computing optimization analysis model, the number of iterations runs to about 10 generations and the optimization error results almost reach a stable value with a intelligent computing algorithm optimization analysis model, because the inertia weights can be adaptively adjusted.

The trained analysis is used for the analysis of the test sample, and the analysis results are shown in Table 2, and the analysis results are compared without optimization.

From the analysis results of watercolor painting materials in China from 2007 to 2009, we can see that the analysis

Figure 10: Liang Quan's Qi series picture.

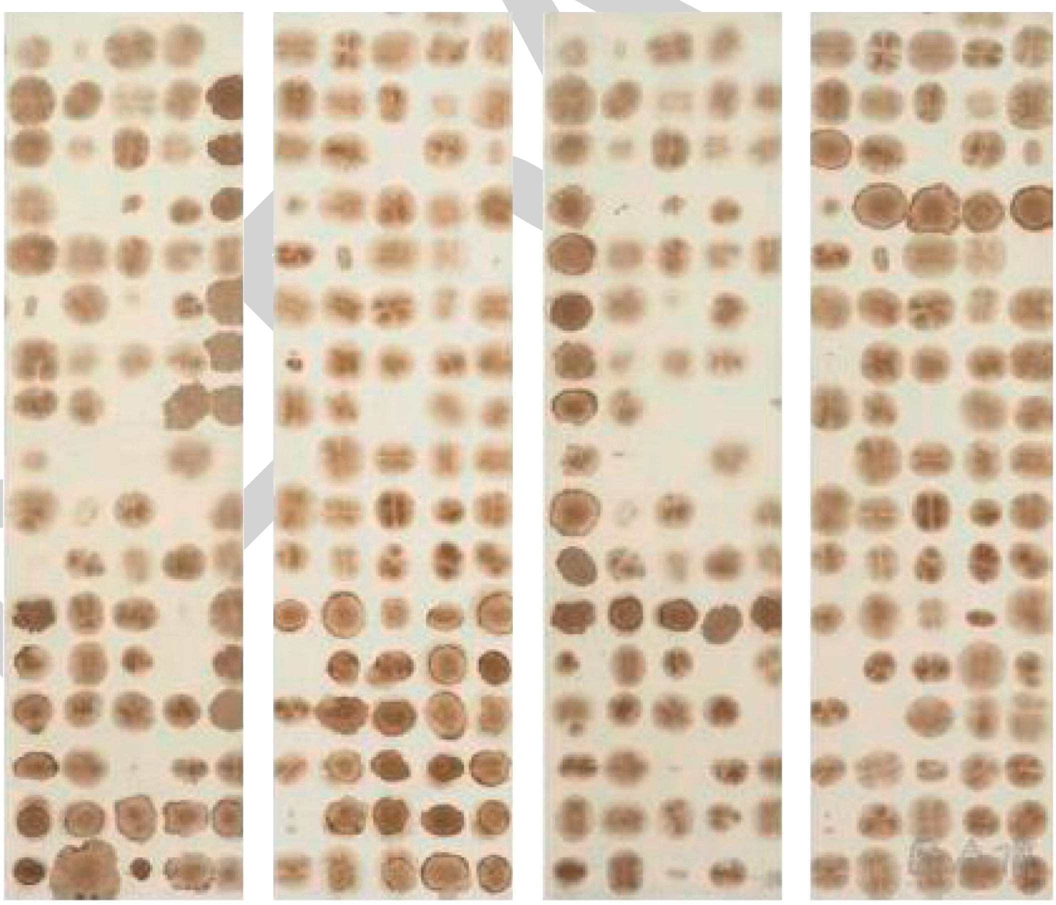

Figure 11: Liang Quan's Qi series picture.

results of the analysis model optimized by intelligent computing algorithm have smaller errors than those of the single network and the analysis errors of the analysis model optimized with intelligent computing are again much smaller than those of the analysis model optimized by intelligent computing algorithm, which can show that intelligent computing algorithm is effective in improving the other algorithms.

The painter Wang Gang tries to combine different materials in his paintings to create watercolor paintings with “Chinese spirit.” He uses markers or oil sticks as a base for parts of the painting before starting to lay down color. In his work “Taihang Mountain Series” (see Figure 8), the picture contains a serious and simple rhythm and spirituality. In his work “Laoshan Series” (see Figure 9), you can see that he uses a combination of materials to embody the ethereal Zen and literati interest of the East, and the picture is light and serene, as shown in Figures 8 and 9.

In the contemporary practice of material analysis in watercolor painting, new materials are constantly being expanded, injecting new vitality into the development of the Chinese-ization of watercolor material analysis.

The artist Liang Quan’s “Signs” series (as shown in Figures 10 and 11) is innovative and highly recognizable in its integrated material analysis, using “tea” mixed with watercolor paint on rice paper. In his daily life, Ambrose Liang treats tea as a kind of “practice” and leaves the effect of staining and spreading on the rice paper with irregular forms after the tea has dried, so that the picture also has the beauty of the relationship between man and nature and the feeling of unity of heaven and man. Liang Quan uses comprehensive materials to express the elements of the poetics of traditional Chinese painting, realizes the realm of “emptiness” by leaving the list of details and entering a simple and random arrangement, and presents the light and distant Zen meaning of traditional Chinese aesthetics with the white space of “managing simplicity with complexity.”

5. Conclusion

In conclusion, the material analysis of watercolor painting has injected a lot of vitality into the Chinese-ness of watercolor material analysis, giving watercolor works the connotation and expressive tension of the traditional Chinese spirit. The brush, ink, paper, and seal in Chinese painting materials all have their material spirits, and the painters convey the aesthetic concepts in traditional Chinese painting through the spiritual materiality of watercolor materials, which are used in watercolor painting as an artistic outlook with national cultural characteristics. The fusion of watercolor painting materials with the unique charm of watercolor painting materials has brought about its own national cultural flavor in the use of brush, ink, and paper without losing its modernity. The actual Chinese-ization of contemporary watercolor painting materials analysis is to absorb the connotation spirit of Chinese painting to reflect the artistic quality and present the artistic value of traditional Chinese aesthetics through “objects.” This paper combines intelligent computing to effectively analyze and apply materials in the context of contemporary watercolor painting, and the results show that the application of intelligent computing technology can better analyze the materials of watercolor painting.

Data Availability

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

Conflicts of Interest

The authors declare that they have no conflicts of interest regarding this work.

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