

## Retraction

# Retracted: Intelligent Auxiliary Artificial Wood Plank Pattern Design Based on the Subject Search Algorithm of Multimedia Resources

#### **Advances in Multimedia**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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.

#### References

 L. Zhao, "Intelligent Auxiliary Artificial Wood Plank Pattern Design Based on the Subject Search Algorithm of Multimedia Resources," *Advances in Multimedia*, vol. 2021, Article ID 6030264, 8 pages, 2021.



## Research Article

# Intelligent Auxiliary Artificial Wood Plank Pattern Design Based on the Subject Search Algorithm of Multimedia Resources

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Regarding the restriction of the wood processing enterprises in the market, intelligent artificial wood materials are mainly based on the demand for pattern quality levels, and the calculation method of multimedia resource theme search is used to achieve the pattern design of intelligent auxiliary artificial wood materials. First, analyze the pattern characteristics of intelligent auxiliary artificial wood materials. After analyzing the characteristics, use the multimedia resource subject search calculation method to carry out the binarization design. At the same time, use the self-learning method to optimize the convergence efficiency and reduce the design time. Finally, pass the softmax designer extracts design schemes for patterns and straight lines.

#### 1. Introduction

When processing wood, the important factor that determines the quality of wood is the pattern of wood. The use value and commercial value of wood and finished products mainly depend on the quality of wood. The utilization rate of domestic raw material wood is relatively low, accounting for only 63%, and the comprehensive utilization rate of foreign wood raw materials has reached 80%, which is a big difference [1-3], mainly because of the low efficiency of wood patterns. In recent years, researchers have proposed methods for detecting wood patterns in order to improve the utilization rate of wood raw materials, such as the 3D scanning wood pattern quantitative method, drilling resistance method to detect wood patterns, and search calculations for faster calculations and multimedia resources, wood pattern recognition, and so on. However, these measures have more or less problems due to the high cost of testing equipment and harsh working environment requirements for actual testing. When identifying wood defects, they often need to go through cumbersome treatments and cannot be widely used for industrialization. However, the wood pattern detection method from the machine perspective not only reduces the identification factor but also does not rely on the prescribed detection equipment, and at the same time, the

standard of the working environment is not high. This detection technology is listed as the first recommended technology [4–6].

Most of the machine vision technologies we have come into contact with in the past are shallow learning calculations. Those shallow learning methods that detect wood patterns are mostly subjected to complex processing tasks, such as image preoperation, segmentation, feature analysis, pattern recognition, edge detection, and other works, but the recognition is not accurate and cannot be engaged in the more cumbersome wood texture detection work. In response to this situation, the deep learning multimedia resource subject search calculation is added to the wood pattern work, and the multimedia resource subject search calculation extraction characteristics and self-learning methods are used at the same time to reduce the design time based on the learning of the priority calculation characteristics.

#### 2. System Structure and Working Principle

Network multimedia resources mean multimedia resources on the Internet, including images, sounds, videos, animations, and so on [7–9]. The theme search system for network multimedia resources is mainly designed. The theme



FIGURE 1: Network multimedia resource topic searcher architecture.

searcher of multimedia resources on the web is the same as the previous theme searcher. It is the center of the theme searcher as a whole. The system composition diagram of the theme searcher is shown in Figure 1, each component link interrelated.

Crawl web pages from the theme spider and the Internet, extract two parts of information, one is the content of the web page, and determine the degree of relevance between the web page and the multimedia theme, and the second is the website link to confirm the page of the theme spider.

#### 3. Topic Search Algorithm for Multimedia Resources

The algorithm flow of the designing pattern problem using the multimedia resource subject search algorithm is shown in Figure 2.

Figure 2 shows the flow of the algorithm for searching the ropes on the subject of multimedia resources and the pattern process  $M_j$  of the artificial wood panels in the group. According to the general rule of the multimedia resource topic search algorithm, the first group is established based on the parameter coding, and then, the genetic operation is performed, and the quasigroup is stopped by the genetic algebra limit.

The substrate demand is estimated as the number of substrates  $N_j^{\alpha}$  required after the *j*-th group of artificial wood board patterns are obtained, and the substrate demand estimation function is Njalefa\_Solve.m. The construction and design of this function are necessary to determine the

number of variables encoded in the multimedia resource topic search algorithm. If the number of types of wooden boards produced by the persons in the  $N_j^{\alpha} = 2$  group is  $M_j = 3$ , the variable dimension  $N_{\text{var}} = (4 \cdot N_j^{\alpha} + 1) \cdot M_j = (4 \times 2 + 1) \times 3 = 27$  is distributed as shown in Figure 3.

In the cube shown in Figure 3, the first layer shows the first substrate. The second floor represents the second substrate. The upper row of each layer indicates the number of types of artificial wood panels and the pattern information of each artificial wood panel. When the number of boards and the type of the  $j^{\text{th}}$  group of wooden boards change, the number of layers of the cube and the number of rows of each layer will change.

Define the search algorithm parameters of the multimedia resource theme.

- ① The scale of the initial group can be selected between 10 and 200 according to the number of patterned artificial wood panels. The maximum genetic algebra is selected according to the actual situation. The generation gap is a positive number less than 1, indicating the difference in the size of the new and old species after recombination.
- ② The parameter is the binary coding method, and the definition of the chromosome is the result of the  $j^{\text{th}}$  group of artificial wood board graphics. A genetic factor is the result of the appearance of the artificial wood board, including five aspects: the number of horizontal columns  $R_{jtk}$ , the number of horizontal artificial columns  $C_{jtk}$ , the number of horizontal artificial



FIGURE 2: Multimedia resource topic search algorithm flow.

wood panels  $n_{jtk}$ , the number of longitudinal artificial wood panels  $m_{jtk}$ , and the discharge method  $p_{jk}$ .

- ③ In the region descriptor, the length of the chromosome depends on the dimension of the variable and the number of binary bits of each variable. The chromosome uses the arithmetic scale, including the boundary.
  - (1) The basic form of the penalty function method uses the penalty function method to deal with equation constraints and inequality constraints in mathematical models [5, 10, 11]. The penalty function method is divided into the exterior point method and the interior point method. The interior point method defines a penalty function in the executable domain. In addition, the search points of optimization

problems without design constraints always remain within the executable area and generally only used for inequality constraints. The exterior point method can also be used for the design of inequality-constrained optimization problems, and it can also be used for the design of equation-constrained optimization problems. Therefore, in a series of designs, in the process of unrestricted optimization of the problem, the outside of the executable domain gradually approaches the original constraint and the best solution to the optimization problem.

The interior point method and the exterior point method have their own advantages and can be used in combination. For the constraints of p equations, the exterior point method is used, and for the constraints of m inequalities, the interior point method is used. The mixed function is as follows:

$$P(X, r^{k}) = f(X) + r^{k} \sum_{\nu=1}^{p} \left[h_{\nu}(X)\right]^{2} + \frac{1}{r^{k}} \sum_{u=1}^{m} \frac{1}{g_{u}(X)}.$$
(1)

In the formula, the penalty factor  $r^k$  is the positive series that is incremented and  $\lim_{k\to\infty} r^k = \infty$ .

(2) Adopt the applicable mixed penalty function method. In order to facilitate calculation and programming, take out the maximum and minimum values of the left term of the equal sign in the following formula. As long as the maximum and minimum values are equal to 0, each term on the left side of the equal sign is equal to 0.

$$\sum_{t=1}^{N_j^a} \sum_{k=1}^{M_j} R_{jtk} \cdot n_{jtk} \cdot p_{jk} + C_{jtk} \cdot m_{jtk} \cdot (1 - p_{jk}) - N_{jk} = 0,$$
(2)

$$ObjV = ObjV_{-}1 + \frac{a1.}{[P1. \times (W - P1)]} + \frac{a2.}{[P2. \times (L - P2)]} + \frac{a3.}{P3} + \frac{a4.}{P4} + a51. \times (P5\_Min) + a52. \times (P5\_Max) + \frac{a6.}{[P6. \times (L \times W - P6)]}.$$
(3)

In the formula, *a*1, *a*2, *a*3, *a*4, *a*51, *a*52, and a6 are the penalty factors.

Assuming that there are M kinds of artificial wood panels participating in the pattern, the number of grouping groups is g, and the number of types of artificial wood panels in the  $j^{\text{th}}$  group is  $M_{i}$ ; then,

$$M = \sum_{j=1}^{g} M_{j}, \, (1 \le j \le g).$$
(4)



FIGURE 3: Distribution of variables to be coded.

According to the pattern criterion, the type of each group of artificial wood panels does not exceed 3, namely,  $1 \le M_j \le 3$ . The size of the *i*<sup>th</sup> man-made wood is  $l_i \times w_i$ , and the demand is  $n_i (1 \le i \le M)$ . The priority is determined according to the area of the artificial wood board. Under normal circumstances, the smaller the area of a single rectangular component, the higher the utilization rate of the substrate. First, the rectangular parts with an enlarged area are placed, and then, the rectangular parts with the small area are discharged. The utilization rate of the base material will not be too low.

First, calculate the area of all M types of artificial wood and arrange them in the descending order.  $S_i = l_i \times w_i$  is  $S_1 \ge S_2 \ge \cdots \ge S_M$ . The first three synthetic wood panels with the largest area are extracted as the first group  $g_1$ , and the 3 artificial wood panels with the largest area among the remaining M-3 kinds of artificial wood panels are taken as the second group  $g_2$  and so on. Set the number of types of wood extracted in the  $j^{\text{th}}$  group  $M_{tj} = 3 \cdot j$ . In this case, when the number of remaining  $M - M_{tj} \le 3$  man-made wood is less than 3, the man-made wood of the remaining  $M - M_{tj}$  species is combined into one group and the last group.

After the above process, the patterns of the M artificial wood panels are grouped and decomposed into g groups, and each group achieves the purpose of dimensionality reduction in the process of the pattern of the small artificial wood panels with no more than 3 types of artificial wood panels.

The mathematical model for constructing grouped dimensionality reduction and nesting is as follows:

$$F = \min \sum_{t=1}^{N_j^a} \left\{ L \cdot W - \sum_{k=1}^{M_j} l_{jk} \cdot w_{jk} \cdot \left[ o_{jk} \cdot n_{jyk} \cdot R_{jtk} + \left(1 - p_{jk}\right) \cdot m_{jtk} \cdot C_{jtk} \right] \right\}.$$
(5)

The layout plan of  $M_j$  rectangular parts in the *j* group includes the following 5 aspects:

- (1) On the  $t^{\text{th}}$  substrate board, the number of horizontal rows of  $k^{\text{th}}$  parts is  $R_{itk}$
- (2) On the  $t^{\text{th}}$  substrate board, the number of vertical rows of  $k^{\text{th}}$  parts is  $C_{itk}$
- (3) On the  $t^{\text{th}}$  substrate board, the number of parts in a row when the  $k^{\text{th}}$  parts are arranged horizontally is  $n_{jtk}$
- (4) On the  $t^{\text{th}}$  substrate board, the number of parts in a row when the  $k^{\text{th}}$  parts are arranged vertically is  $m_{itk}$
- (5) The discharge method of the  $k^{\text{th}}$  rectangular parts in the  $j^{\text{th}}$  group of rectangular parts is  $p_{jk}$

### 4. Intelligent-Assisted Artificial Wood Plank Pattern Design

This study uses the DBN composed of four layers of artificial wood panels to identify wood patterns and uses a further BP neural network to fine-tune the parameters. The DBN is a deep neural network model containing multiple hidden layers. This study is composed of four RBMs. The input data are used as the visible layer of the first layer of RBM for unsupervised pretraining. After four layers of RBM, the BP neural network can be added. Convert the learned representations into supervised predictions. In order to enable the DBN to better process image information, a local binary pattern (local binary pattern multimedia resource topic search algorithm) is added in this study to optimize the design process using the self-learning learning rate for feature extraction. The software maximum classifier is added to the layer to realize feature classification.

#### 5. The Processing of Wood Images by the Subject Search Algorithm of Multimedia Resources

The theme search algorithm of multimedia resources can extract the characteristic information of the pattern [5, 12, 13]. Since 14 kinds of performance are better in extracting texture features, this study uses the topic search algorithm of multimedia resources to extract the feature information of wood patterns. Multimedia resource topic search algorithm operator is limited to 3. Within the range of three pixels, compare the pixels around the square with the pixel size at the center of the square as a reference. If the value of the peripheral pixel is greater than the central value, the value of the current position is set to 1. Set the value of the current position to 0. Through this rule, the pixel value of the original local area is binarized, thereby facilitating postimage processing. In order to make the extracted feature rotation invariant, the local area selected by the multimedia resource topic search algorithm is rotated to obtain multiple binarized series of different modes, and the smallest numerical value is selected from these series to represent that feature value. In addition, a uniform multimedia resource topic search algorithm mode is required, that is, the binary sequence is converted from 0 to 1 or from 1 to 0 not more than twice (the binary sequence is connected to the first tail), and the dimensionality reduction effect can overcome the rotation The problem of large frequency difference distributed on an image in the theme search algorithm mode of multimedia resources. This study uses this uniform multimedia resource topic search algorithm mode to ensure the rotation invariance of the image. Figure 4 shows the local binarization process of the multimedia resource topic search algorithm operator. Figure 5 shows a statistical histogram of the grayscale of wood images and the processing of the multimedia resource subject retrieval algorithm. According to the feature matrix of the multimedia resource topic search algorithm in Figure 4, the binary column 1110011 is obtained clockwise from the upper left corner, and the binary column is converted to the decimal value of the multimedia resource topic search algorithm. The pixel multimedia topic search algorithm value source is 1 + 2 + 4 + 32 + 64 + 128 = 231. Similarly, the feature histogram of the multimedia resource topic search algorithm for wood images can be counted.

### 6. Wood Pattern Design Based on the Multimedia Resource Topic Search Algorithm and Self-Learning DBN

Figure 6 shows the specific process of using the multimedia resource topic search algorithm for feature extraction and wood pattern design from learning DBN classification.

- (a) Data preprocessing: first, the image is divided into blocks according to the characteristics of the wood image database [14]. Then, the average multimedia resource topic search algorithm is used to process the pixels of each block to obtain the multimedia resource topic search algorithm value of each pixel. Count and normalize the histogram of each block. Finally, the histogram obtained from each block is expressed as a feature vector, which is convenient for learning and processing the DBN.
- (b) Data processing: the obtained feature vector is input from the learning DBN network. Extract the indepth information of the feature vector from the following, use equations (3)–(5), and the update design of the self-study learning rate; after initially determining the spatial parameter  $\{b_i, c_j, W_{ij}\}$  in the network structure, use the BP algorithm to fine-tune and optimize the parameters.



FIGURE 5: The histogram of the image processed by the grayscale and multimedia resource topic search algorithm.

(c) After each network layer is constructed, a soft maximum classifier is set in the output layer to classify the output data

#### 7. Example and Result Analysis

There are a total of 500 design samples, and the size is  $144 \times 96$ . Among them, 400 are used as design samples and 100 are used as test samples. Some sample images are shown in Figure 7. The cedar tree patterns in the sample mainly



FIGURE 6: Wood pattern design process based on the theme search algorithm of multimedia resources.



FIGURE 7: Design sample example.



FIGURE 8: The relationship between the error rate of different learning rates and the number of iterations.

TABLE 1: Comparison of error rates of several different image classification methods.

Algorithm name	Error rate (%)	Algorithm name	Error rate (%)
AdaBoost + ELM	7.31	CNN + softmax	5.42
SVM	8.77	Media resource topic search algorithm	3.59
BP	10.60	C C	

have three patterns of knots, cracks, and holes, as well as two main textures of straight grain and pattern. Therefore, the defects and textures are arranged and combined to obtain eight classification results as follows: knot + straight pattern, knot + pattern, crack + straight pattern, crack + straight pattern, hole + straight pattern, hole + pattern, no defect + straight pattern, no defect + pattern, which are denoted by  $k_0$ - $k_7$ .

Through the establishment of the model, the increment factor and decrement factor are 1.5 and 0.6, respectively. In the initialization, the learning rate of each layer of DBN is set to 0.2. As the number of iterations increases, the advantage of the self-learning DBN over the fixed learning rate DBN becomes more and more obvious, as shown in Figure 8.

In order to further verify the effectiveness of the classification algorithm, this study compares the multimedia resource topic search algorithm with other four representative algorithms, that is, the extreme learning machine (ELM), support vector machine (SVM), feedback propagation algorithm (BP), and winding neural network (CNN). Here, the ELM and SVM use two relatively wide algorithms in the shallow learning algorithm (Table 1).

#### 8. Conclusions

This study analyzes the detailed work of the multimedia resource subject search calculation in the intelligent artificial wood pattern and texture detection and uses the calculation method of the multimedia resource subject search method to obtain the wood pattern and texture of the collected intelligent auxiliary artificial wood graphics processing. However, experiments have proved that the rectangular pattern reasoning designed by the fusion of multimedia resource subject search calculation and penalty function mentioned in this study is correct, and at the same time, it needs to meet the "one size fits all" standard of the process and improve the speed of intelligent auxiliary wood sawing.

#### **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 they have no conflicts of interest.

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