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Research Article

Fuzzy Applications in Demonstration of Chinese Teaching Research Based on Machine Learning

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In order to improve the effect of Chinese teaching, this paper combines machine learning to conduct Chinese teaching research, constructs an intelligent Chinese teaching system, and conducts online monitoring of the Chinese teaching process. Moreover, this paper uses the general histogram matching algorithm to transfer the color style of the source image to the original image. The image's local color information will be lost as a consequence of this procedure, according to the processing findings. This paper proposes a multi-directional cutting algorithm to partition the image, then uses the local linear embedding algorithm to realize the color style transfer method, and builds an intelligent Chinese teaching system based on machine learning to achieve a more realistic and natural color style transfer effect. The experimental research shows that the Chinese teaching method based on machine learning proposed in this paper can effectively improve the quality of Chinese teaching.

1. Introduction

The blended Chinese teaching for international students from the perspective of fusion media needs to respect the basic rules of Chinese teaching for international students, base on the actual situation of Chinese learning for international students, and aim at the development trend of Chinese teaching for international students. At the same time, it needs to focus on the language cognition, communication and comprehension skills cultivated by foreign students' Chinese teaching, and theoretically design a model of blended Chinese teaching for foreign students from the perspective of media integration, including constructing a teaching model and analyzing its elements and links. Moreover, in the specific teaching practice, it is necessary to realize the combination of traditional and modern media platforms, and provide theoretical support and path guidance to improve the Chinese proficiency of international students from easy to difficult, step by step. On this basis, through typical cases, this paper analyzes the specific practice of blended Chinese teaching for international students from the perspective of media integration.

Formal classroom instruction comprises both Chinese instructors' instruction and individual study by overseas students. International students may carry out Chinese learning plans as required and explain the learning methods of important and difficult information via the teacher's classroom lectures in the blended Chinese teaching mode from the standpoint of media fusion.

Through the implementation of the "Internet +" strategy, a teacher learning community will be established, which will promote the reform of traditional Chinese teaching and the improvement of the quality of Chinese teacher training. A learning community is a group composed of learners and their assistants. They often communicate and communicate with each other in the learning process, share various learning resources, and jointly complete learning tasks, thus forming mutual influence and mutual influence among members. Facilitated human connection. In traditional teaching, teachers and students participate in teaching activities in a classroom at the same time, which can naturally form a certain learning community, such as a study group and a class. In the network-based learning environment, the learning community must be consciously designed to form. The feasible measures to establish a Chinese language learning community for teachers at home and abroad include: promoting the transformation of smart learning and talent training models through online education; promoting the in-depth integration of information technology and Chinese teaching; promoting mutual support between online and offline learning; promoting Reform of training Chinese teaching talents in regular universities and open universities; strengthening the quality assurance of online education.

Complexity, variety, unpredictability, and situational qualities define international Chinese teaching, and the training of Chinese teaching instructors is marked by complex and varied student and work histories. For example, some students in the same class do not know Chinese, while others have a strong linguistic base but poor teaching abilities. Some pupils are culturally illiterate, while others are gifted. Precision teaching is very necessary for the training of Chinese teachers, and the current Master of Teaching Chinese to Speakers of Other Languages program cannot meet the needs of individualized and targeted education. In order to teach students in accordance with their aptitude and cultivate teachers based on their personalities and interests, it can be achieved through the development of "Internet +" channels such as MOOC courses and platforms and online one-to-one teaching platforms. In addition, the training of Chinese language teachers needs to formulate long-term plans, narrow the digital divide between different regions and different countries, and promote the Internet dividend to benefit every Chinese language teaching staff.

This paper combines machine learning to conduct research on Chinese teaching, and builds an intelligent Chinese teaching system, which can monitor the Chinese teaching process online, and combines machine vision to improve the Chinese teaching process in real time, so as to improve the effect of Chinese teaching.

2. Related Work

Literature [1] summarizes the progress of using the network for teaching from the four aspects of participating units, teaching technology, teaching methods, and teaching institutions, and discusses its existing technology, network, talent, and investment issues. Literature [2] discusses the reform of teaching Chinese as a foreign language and proposes a balance between traditional classroom teaching and online teaching of Chinese as a foreign language, in the hopes that modern educational technology will create a harmony between teachers, students, and modern media technology. With the fast advancement of network technology, it has become more integrated into our daily lives. There are more and more studies on the use of modern network technology to promote the teaching of Chinese as a foreign language [3]. Literature [4] pointed out that traditional teaching can no longer meet the needs of international promotion of Chinese, and it is necessary to vigorously use the Internet to carry out distance Chinese teaching through diversified curriculum settings, nationalization of textbooks and courseware, and the interaction of "teaching" and "learning." Literature [5] pointed out that the teaching resources of Chinese as a foreign language, including teachers, teaching materials, and means of teaching, are seriously insufficient, and reminded the in-depth discussion of online teaching.

Generally speaking, information technology can be defined as a means that can support the reception, transmission, processing, preservation and expression of information. In the scope of education, there are many applications: electronic audio and video technology, satellite TV technology, multimedia computer technology, network communication technology, artificial intelligence technology and virtual reality technology [6]. The information technology involved in the thesis mainly refers to the modern information technology with multimedia computer and network technology as the core, including multimedia technology, computer technology and network technology. From the application of information technology in teaching, the application of information technology mainly includes hardware application and software application. The application of hardware includes: multimedia classroom, multimedia network classroom, computer room, multimedia voice laboratory and various teaching media, etc. The application of the software [7]; the application of the software includes: the application software system matched with the hardware, the Internet and the application of digital teaching resources [8].

Literature [9] deeply explores the mode and characteristics of Chinese MOOC teaching. These research results have played a good reference role in the writing process of this paper. Literature [10] put forward several suggestions for strengthening the construction of Chinese teaching MOOCs in the future: the state should increase the support of policy funds; colleges and universities should focus on improving the quality of Chinese teaching MOOCs; MOOC lecturers should continuously improve their own level and ability. Literature [11] believes that it may be better to concretize the measures, so the author proposes to build a professional Chinese teaching MOOC platform. Literature [12] studies the cultural teaching under the MOOC mode, and shows that the international influence of culture can be effectively improved through the form of cultural teaching MOOCs. Literature [13] carried out the integration of teaching according to the characteristics of the MOOC model and cultural teaching, and carried out the curriculum design and actual curriculum practice of = cultural MOOC. The practice of using MOOCs for cultural teaching has a good reference for the combination of MOOCs and offline teaching.

The necessity for a professional Chinese teaching MOOC platform was stated in reference [14], and the study detailed how to design a MOOC course from the ground up, as well as analyzing the usefulness of MOOCs in Chinese classrooms. In [15], the specific construction of a Chinese teaching MOOC platform can further supplement and improve its research results. Reference [16] expounds the important role of video resource development and construction in Chinese MOOCs, and proposes corresponding specific solutions. Literature [17] proposed that the classification dimension of Chinese teaching videos and the genealogy and development of knowledge points should be established, as well as the establishment of "MOOC" micro-video resources.

3. Color Recognition of Online Chinese Teaching Graphics Based on Machine Learning

When engaging in rapid product design, a very common operation is to use the existing color style images retrieved above to replace the color style of the specified product. To change the color style of the product, it is necessary to remove the main color of the original product and some undesired colors, and then give the original product some other desired colors. At present, existing image processing software, such as Adobe Photoshop CS series, can remove some unwanted colors and give some new colors. For some skilled designers, the above operations are not very challenging, but it still takes some time to constantly try new color and scene coordination degrees. For those non-senior professional designers, this process is very difficult because of the lack of color expertise. Ordinary users prefer to deal with problems in a way that is visible and available. That is, the color style of the existing visible color model is transferred to the target product that needs to change the color style. As shown in Figure 1(a) is the original product, 1(b) is the source color style model, and 1(c) is the target product after style transfer.

The color characteristics of an image can be represented by the proportional distribution of various colors and the spatial distribution of colors. Most of the current image processing technologies based on color features use the method of color ratio distribution to characterize color features, which is the color histogram method in the field of color research. It is a very practical and popular color feature analysis method adopted by many existing image processing systems. The information on the histogram is derived using statistical techniques and represents the quantitative features of the image's color. Furthermore, its color information function provides a statistical value for the image's color distribution. The horizontal axis of the color histogram represents the color value, and the vertical axis represents the frequency $H(k) = n_k/N$ of pixels with the same color value appearing in the whole image, that is, the number of pixels of this color.

As one of the most commonly used color vision feature extraction methods, color histogram has many advantages:

First, it describes the global distribution of colors in an image, that is, the proportion of different colors in the entire image, regardless of the spatial location of various colors. Therefore, it is particularly suitable for describing those images that are difficult to automatically segment and those that do not need to consider spatial location.

Second, the color histogram method has translation invariance and rotation invariance, that is, the same histogram is obtained after the image is distorted and translated.

Third, the color histogram is highly superimposable. That is to say, if the image is divided into several sub-regions, the sum of the histograms of all sub-regions is equal to the global histogram of the image.

For color style transfer between images, in order to obtain a natural and realistic processing effect, the extraction of brightness information in the original image is critical. The color information of color images can be easily extracted from the color statistical histogram, but the brightness information of the image is difficult to obtain directly from the color histogram. To extract the brightness information of an image, the image must first be processed in grayscale to remove the interference of color information, as shown in Figure 2.

After the grayscale processing of the image, the brightness information of the image is counted by matlab, and the brightness histogram of the two images is formed. The directly obtained brightness histogram is similar to the histogram of 3, which is a dense histogram that is inconvenient to process. Therefore, we need to transform the above histogram into a new value according to a certain rule according to the original value, so as to realize a histogram with a relatively uniform distribution. This process is the equalization of the histogram.

The histogram-based product color style transfer transforms the target color style model's histogram into the source color style model's histogram. This is known as histogram specification. The conversion technique between the histogram of the target color style model and the histogram of the source color style model is the key to histogram definition.

Visually speaking, the working goal of color style transfer is to convert the color style of the target image into the same color style as the source image. Technically, it is necessary to unify the color features of the original image and the source image in the Z-color space.

Image color distribution mean and standard deviation are two important consistency references. For this, we first choose I_{ref} as the source image and I_{src} as the original image. The original and source images are then converted to the $l\alpha\beta$ color space using formulas. In the $l\alpha\beta$ color space, the mean of the data distribution is first subtracted from each pixel in the image I_{src}.

$$\begin{aligned} l^* &= l_{\text{src}} - E(l_{\text{src}}),\\ \alpha^* &= \alpha_{\text{src}} - E(\alpha_{\text{src}}),\\ \beta^* &= \beta_{\text{src}} - E(\beta_{\text{src}}). \end{aligned} \tag{1}$$

Among them, $I_{\text{src}}, \alpha_{\text{src}}, \beta_{\text{src}}$ is the channel value of the three channels of the original image I_{src} in the $l\alpha\beta$ color space, $E(P_{\text{src}})$ is the mean value of the image data

Figure 1: Schematic diagram of color style transfer (a) Original grayscale image (b) Source color style image (c) Target image.

Figure 2: Decolorization of the image to grayscale (a) Original image.

distribution, and $P = l, \alpha$ or β. The formula for calculating the mean is as follows:

$$E(P) = \frac{1}{M \times N} \sum_{i=0}^{M-1} \sum_{j=0}^{N-1} P_{ij}. \tag{2}$$

Among them, M and N are the length and width of the image, and P_{ij} is the specified pixel value. Different channel values in the $l\alpha\beta$ color space represent different pixel values.

Then the data of image I_{src} is corrected according to the standard deviation of images I_{src} and I_{ref}:

$$\begin{aligned} l' &= \frac{\sigma^l_{\mathrm{ref}}}{\sigma^l_{\mathrm{src}}} l^*, \\ \alpha' &= \frac{\sigma^\alpha_{\mathrm{ref}}}{\sigma^\alpha_{\mathrm{src}}} \alpha^*, \\ \beta' &= \frac{\sigma^\beta_{\mathrm{ref}}}{\sigma^\beta_{\mathrm{src}}} \beta^*. \end{aligned} \tag{3}$$

Among them, $\sigma^l_{\mathrm{ref}}, \sigma^\alpha_{\mathrm{ref}}, \sigma^\beta_{re}$ is the standard deviation of the source image I_{re} on the three channels in the color space $l\alpha\beta$, and $\sigma^l_{\mathrm{src}}, \sigma^\alpha_{\mathrm{src}}, \sigma^\beta_{\mathrm{scc}}$ is the standard deviation of the original image I_{sc} on the three channels in the color space $l\alpha\beta$. The standard deviation is calculated as follows:

$$\sigma(P) = \frac{1}{M \times N - 1} \sum_{i=0}^{M-1} \sum_{j=0}^{N-1} \left(P_{i,j} - E(P)\right). \tag{4}$$

Among them, M and N are the length and width of the image, and P_{ij} is the specified pixel value.

After the above conversion, the standard deviation of the original image I_{src} in the color space $l\alpha\beta$ is consistent with the standard deviation of the source image I_{ref} in the color space. Then, each pixel in the original image I_{src} plus the mean of the source image I_{ref} gets the value of the target image I_{target} in the three channels of the color space $l\alpha\beta$:

$$\begin{aligned} l_{target} &= l' + E(l_{re}), \\ \alpha_{target} &= \alpha' + E(\alpha_{ref}), \\ \beta_{target} &= \beta' + E(\beta_{ref}). \end{aligned} \tag{5}$$

Among them, $E(l_{ref}), E(\alpha_{re}), E(\beta_{ref})$ represents the mean of the three channels of the source image in the color space $l\alpha\beta$, respectively. Finally, in order to show the effect of the transfer, this paper also needs to convert the target image I_{target} from the color space $l\alpha\beta$ to the RGB color space according to the formula to complete the color style transfer.

One of the reasons for the above phenomenon is that when the color feature of the image cannot take all possible values, there will be some zero values in the statistical histogram. The presence of these zero values affects the histogram consistency assessment of the two photos, causing the similarity measure to misrepresent the color difference between them. On the other side, it is due to data loss during the equalization and specification processes. In order to solve the above problems, the idea of divide and conquer can be adopted, and the image is divided into several blocks according to the different blocks, and the statistical information of each block is calculated separately. Finally, according to the stackability of the height of the histogram, the statistical information of each block is superimposed to form the global color information of the target image. In this way, the loss of local data information can be effectively reduced. This paper uses an interactive algorithm to parse the image into different semantic objects according to the different material properties of the image. Then, the style source image is retrieved from the image retrieval system, and finally the color style transfer from the source image to the original image is realized using a constrained local linear embedding algorithm. The process of using the local linear embedding algorithm to achieve color style transfer is shown in Figure 3.

Local Linear Embedding Algorithm (LLE) is a nonlinear dimensionality reduction algorithm, which can keep the original topology of the dimensionally reduced data. The LLE algorithm can be boiled down to three steps:

(1) The algorithm finds the k nearest neighbors of each sample point.

(2) The algorithm calculates the local reconstruction weight matrix of each sample point from the neighboring points of the sample point.

(3) The algorithm calculates the output value of the sample point from the local reconstruction weight matrix of the sample point and its neighbors.

The specific algorithm flow is shown in Figure 4.

The first step of the algorithm is to calculate the k nearest neighbors of each sample point. The nearest k sample points relative to the desired sample point are defined as the adjacent points of the desired sample point. k is a predetermined value, and the distance between sample points is calculated according to the conventional Euclidean distance formula. The second step of the algorithm is to calculate the local reconstruction weight matrix of the sample points. This paper defines the reconstruction error function as follows:

$$\min \varepsilon(W) = \sum_{i=1}^{N} \left| x_i - \sum_{j=1}^{k} w_{ij} x_j \right|^2. \tag{6}$$

Among them, x_j $(j = 1, 2, \ldots, k)$ is the k adjacent points of x_i, w_{ij} is the weight between x_i and x_j, and must satisfy $\sum_{j=1}^{k} w_{ij} = 1$. In order to obtain the matrix W, it is necessary to construct the local covariance matrix Q^i.

$$Q^i_{jm} = \left(x_i - x_j\right)^T \left(x_i - x_m\right). \tag{7}$$

Combining the above formula with $\sum_{j=1}^{k} w_{ij} = 1$, and using the Lagrange multiplier method, the locally optimized reconstruction weight matrix can be obtained.

$$w^i_j = \frac{\sum_{m=1}^{k} \left(Q^i\right)^{-1}_{jm}}{\sum_{p=1}^{k} \sum_{q=1}^{k} \left(Q^i\right)^{-1}_{pq}}. \tag{8}$$

The final step of the algorithm is to map all sample points into a low-dimensional space. The mapping conditions are met as follows:

$$\min \varepsilon(Y) = \sum_{i=1}^{N} \left| y_i - \sum_{j=1}^{k} w_{ij} y_j \right|. \tag{9}$$

Among them, $\varepsilon(Y)$ is the loss function value, y_i is the output vector of x_i, y_j $(j = 1, 2, \ldots, k)$ is the k nearest neighbors of y_i, and two conditions must be met:

$$\sum_{i=1}^{N} y_i = 0, \frac{1}{N} \sum_{i=1}^{N} y_i y_i^T = I. \tag{10}$$

Among them, I is the identity $m \times m$ matrix. Here w_j $(i = 1, 2, \ldots, N)$ can be stored in a $N \times N$ sparse matrix, $W_{ij} = w_{ij}$ when x_j is a neighbor of x_i, and $W_{ij} = 0$ otherwise. Then the loss function can be rewritten as:

$$\min \varepsilon(Y) = \sum_{i=1}^{N} \sum_{j=1}^{N} M_{i,j} y_i^T y_j. \tag{11}$$

Among them, M is a $N \times N$ symmetric matrix. Its expression is:

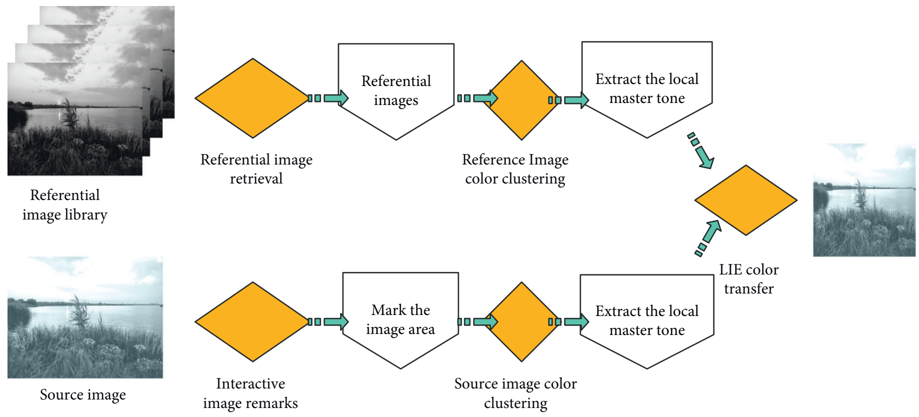

FIGURE 3: The process of linear embedding algorithm for image color style transfer.

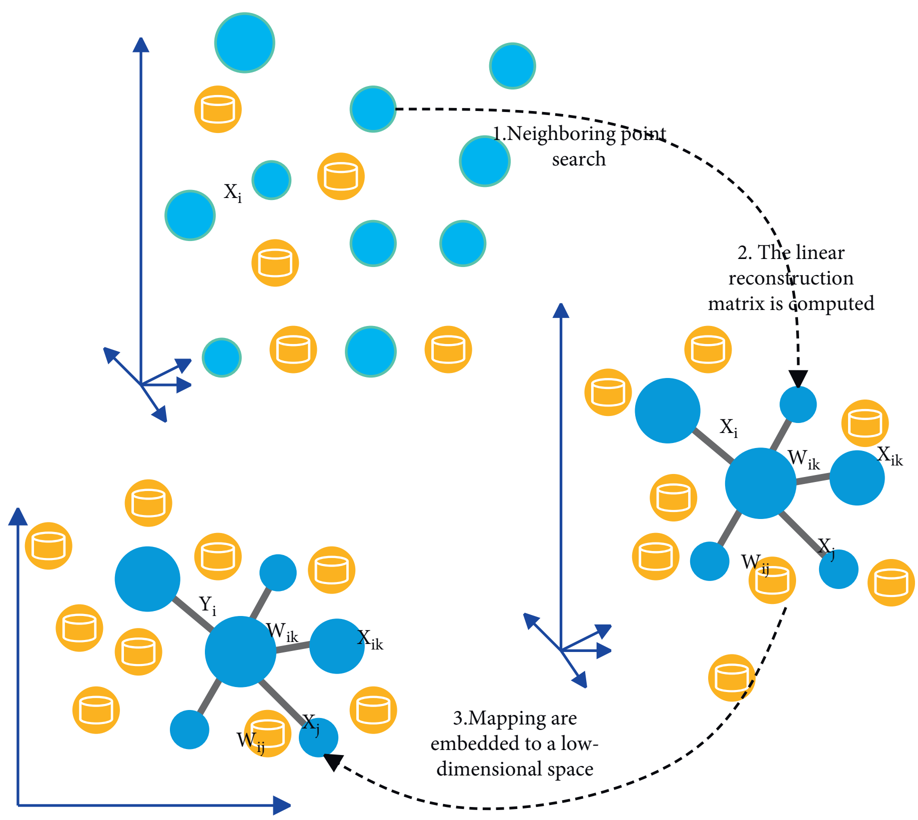

FIGURE 4: The flow of the linear embedding algorithm.

$$M = (I - W)^T (I - W). \quad (12)$$

The main advantages of the local linear embedding algorithm are: (1) It has better time complexity. (2) It needs to set less parameters, only need to set the neighbor parameters and the dimension of embedding. (3) It is a non-iterative method and avoids the local minimum problem. (4) The solution of the problem boils down to the solution of the eigenvectors of the spherical sparse matrix, so it can solve the problem of large capacity data.

Because the local linear embedding approach is focused on finding nearby samples of related samples, this work separates the input picture into various local blocks using an interactive multinomial cutting algorithm.

Automatic picture area segmentation technique is not adequate for the demands of common non-senior expert users since it requires substantial previous knowledge to represent the issue. As a result, this research uses a visible and accessible man-machine interactive picture cutting approach. In recent years, due to the advantages of human-computer interaction technology, such as simple operation and image, it has attracted many experts and scholars to conduct research and discussion on various aspects of human-computer interaction technology and have made great progress. Therefore, both in

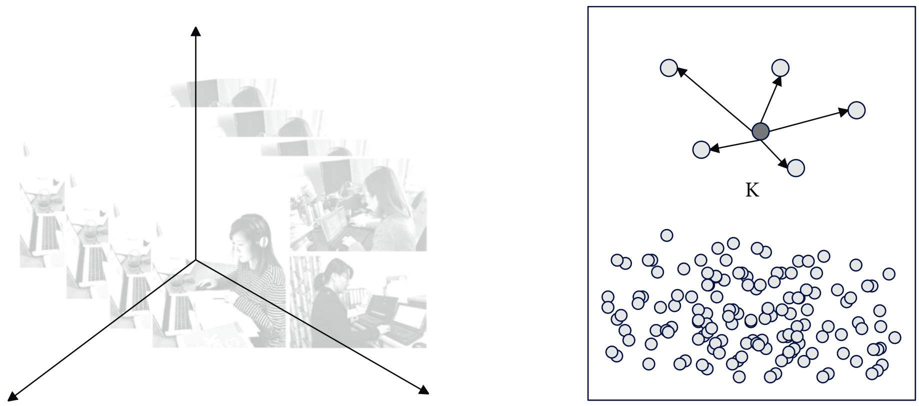

Figure 5: k-approximation neighborhood search for spatial distribution.

theory and practical application have been very mature. This chapter adopts the widely used multi-directional cutting algorithm to realize the human-computer interactive image segmentation system based on human emotion cognition.

We assume that image I is the input image. Firstly, this paper needs to divide the image content into K disjoint semantic regions $R_i\,(i = 1, 2, \ldots, K)$ according to different objects in the image content. The division of semantic regions is determined according to the image content.

To segment the image I, each region R_i is marked with a different color, and then the α-expansion algorithm is used to segment the image into K different regions.

$$\Lambda = \Lambda_1 \cup \Lambda_2 \cup \cdots \cup \Lambda_K. \tag{13}$$

Among them, Λ is the domain of the entire image lattice, Λ_i is the domain of the i-th region, and there is $\Lambda_i \cup \Lambda_j \neq \phi$ for all $i \neq j$.

After the image segmentation is completed, this paper assigns a semantic label l_i to each region, and classifies the segmented local regions according to the texture Boosting algorithm. In fact, once the regions of the image are segmented, the classification of regions becomes easy to operate. After the above steps of semantically tagging the original image, this paper needs to use the image retrieval system in Chapter 3 to retrieve the source image. After retrieving the semantically matched source images through the retrieval system, it is necessary to perform cluster analysis on the colors in the two images to extract the main color of each part.

After obtaining the spatial distribution of the local dominant tone of the original image and the source image, the local linear entry algorithm can be used to transfer the color style of the two images. Both the original image I_{src} and the source image I_{ref} belong to the color space $\mathbb{R}^3$, that is, $I_{\text{scc}} \subset \mathbb{R}^3, I_{\text{ref}} \subset \mathbb{R}^3$. Then, the color style transfer between two images can be summarized into the following steps:

Step 1. The algorithm obtains all the colors S of the original image I_{scc} and all the colors R of the source image I_{ref}:

$$\begin{aligned} S &= \{x_1, x_2, \ldots, x_n\}, \quad x_i \in \mathbb{R}^3, \\ R &= \{r_1, r_2, \ldots, r_n\}, \quad r_i \in \mathbb{R}^3. \end{aligned} \tag{15}$$

If two images have the same color, the algorithm places it in S or R.

Step 2. After the algorithm marks the area of the image according to the above-mentioned human-computer interaction, it uses the clustering algorithm to perform color clustering on the original image I_{src} and the source image I_{ref}, and obtains the main colors C_{src} and C_{ref} of the corresponding semantic regions of the original image and the source image, respectively.

$$\begin{aligned} C_{\text{src}} &= \{x^{(1)}, x^{(2)}, \ldots, x^{(K)}\}, \\ C_{\text{ref}} &= \{r^{(1)}, r^{(2)}, \ldots, r^{(K)}\}, \\ X &= S \cup C_{\text{src}}, |X| = N + K. \end{aligned} \tag{16}$$

Among them, the dominant tone set $C_{\text{src}}, C_{\text{ref}}$ is a hard constraint on the local linear embedding.

Step 3. The algorithm uses the approximate nearest neighbor search algorithm to search for k nearest neighbor points for each element in X, as shown in Figure 5.

Step 4. The algorithm calculates the reconstruction matrix W.

$$W^* = \arg\min \varepsilon(W) = \arg\min \sum_i \Big| x_i - \sum_j W_{\text{ij}} x_j \Big|, \tag{17}$$

W_{ij} satisfies $\sum_j W_{ij} = 1$. Among them, W_{ij} is the contribution weight of the reconstruction of color x_j to color x_i.

Step 5. The algorithm computes the embedded color Y using the reconstruction matrix.

$$Y^* = \arg\min \sum_i \Big| y_i - \sum_j W_{ij} y_j \Big|. \tag{18}$$

Among them, y satisfies $y_{N+1} = r^{(1)}, \ldots, y_{N+K} = r^{(K)}$.

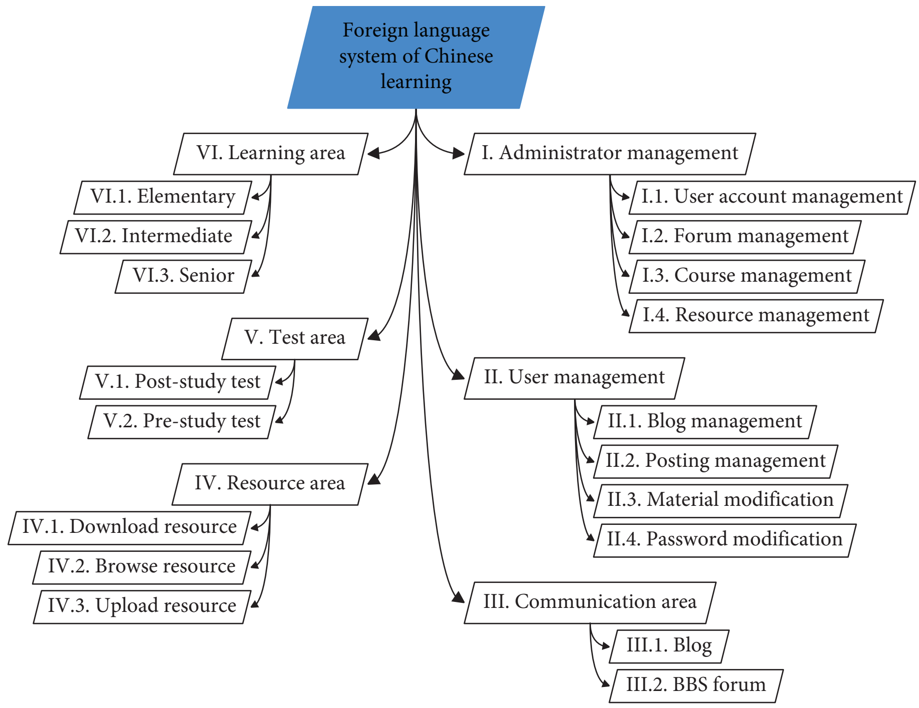

FIGURE 6: Functional modules of Chinese learning system.

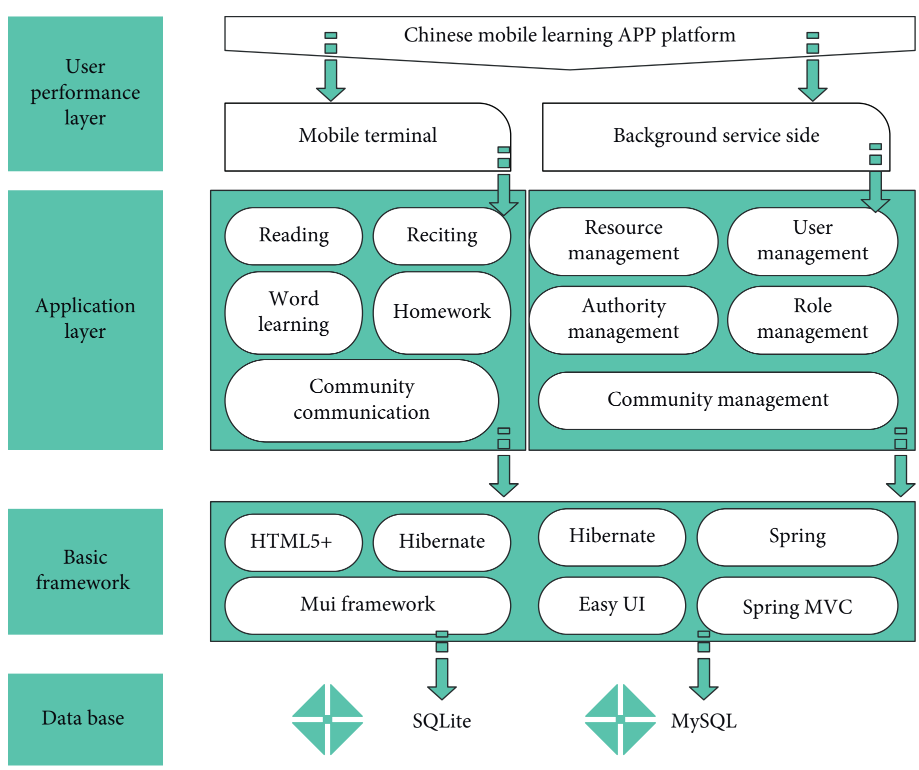

FIGURE 7: Chinese teaching research system based on machine learning.

Table 1: The accuracy rate of feature recognition of classroom students in the Chinese teaching method based on machine learning.

Number	Feature capture	Number	Feature capture	Number	Feature capture
1	85.88	21	81.79	41	77.93
2	82.80	22	79.49	42	88.09
3	86.10	23	80.29	43	84.48
4	77.14	24	81.85	44	88.85
5	79.20	25	84.44	45	84.61
6	88.50	26	84.68	46	84.88
7	78.80	27	84.89	47	77.40
8	83.90	28	87.82	48	79.85
9	90.38	29	88.58	49	77.89
10	83.22	30	84.14	50	81.48
11	81.13	31	83.13	51	77.05
12	87.52	32	88.43	52	78.58
13	83.43	33	86.49	53	89.53
14	87.66	34	86.83	54	77.77
15	89.72	35	86.00	55	87.37
16	82.99	36	84.52	56	84.75
17	77.14	37	79.59	57	78.04
18	83.81	38	77.27	58	85.79
19	78.72	39	77.91	59	87.18
20	88.92	40	87.27	60	88.05

Table 2: Evaluation of the effect of Chinese teaching methods based on machine learning.

Number	Teaching improvement	Number	Teaching improvement	Number	Teaching improvement
1	78.21	21	70.96	41	79.51
2	75.21	22	80.34	42	77.36
3	78.25	23	74.99	43	73.53
4	73.18	24	74.78	44	79.79
5	72.22	25	78.81	45	72.53
6	78.47	26	76.17	46	79.47
7	75.61	27	72.02	47	69.81
8	71.21	28	74.37	48	80.67
9	79.04	29	70.28	49	76.05
10	81.10	30	73.44	50	80.53
11	80.92	31	78.30	51	70.93
12	81.97	32	78.23	52	79.98
13	79.77	33	78.70	53	72.39
14	76.13	34	79.90	54	80.25
15	78.00	35	81.77	55	70.60
16	70.68	36	76.44	56	77.23
17	71.92	37	80.91	57	72.37
18	79.46	38	77.90	58	81.87
19	72.58	39	69.13	59	72.53
20	81.51	40	74.42	60	71.93

Step 6. The algorithm uses the mapping of color set $\{X_i\}$ to color set $\{Y_i\}$ to calculate the target image I_{target} after color style transfer.

4. Demonstration of Chinese Teaching Research Based on Machine Learning

Requirements analysis is critical to the software development process, and it even dictates the broad direction of future development efforts. The quality and success of software development projects are directly influenced by the accuracy and comprehensiveness of requirements analysis findings. The business tasks that the system may perform are referred to as functional requirements. The main functional modules of this Chinese learning system are shown in Figure 6:

This software is based on an intelligent machine learning platform and uses the MUI front-end framework to unify the interface style of the software. The background server is developed with Spring + SpringMVC + Hibernate + EasyUI framework, and the software stores data information with the help of MySQL and SQLite databases. The software architecture is shown in Figure 7:

On the basis of the above model, this paper combines machine learning and the algorithm of the third part to identify the characteristics of students' online teaching. On this basis, this paper uses the simulation algorithm to verify the effect of the feature recognition algorithm in this paper, and combines the expert evaluation to evaluate the improvement effect of this method on Chinese teaching, and the results shown in Tables 1 and 2 are obtained.

It can be seen from the above research that the Chinese teaching method based on machine learning proposed in this paper can effectively improve the quality of Chinese teaching and contribute to the teaching reform of Chinese teaching.

5. Conclusion

Due to the incomplete knowledge structure of foreign students themselves, there are inevitable difficulties in the process of learning Chinese. If it is difficult for teachers to answer questions for international students in a timely manner, students will not be able to give good guidance and feedback on some thinking and ideological knowledge. From the standpoint of fusion media, the blended Chinese teaching model may actualize online independent study, group collaboration, platform Q&A, and interactive feedback in informal learning after class. Furthermore, Chinese professors may give additional materials to assist overseas students in better understanding Chinese knowledge and culture, as well as deepen their study of cultural norms and other areas. This paper combines machine learning to conduct Chinese teaching research, and constructs an intelligent Chinese teaching system, which can monitor the Chinese teaching process online. The experimental research shows that the Chinese teaching method based on machine learning proposed in this paper can effectively improve the quality of Chinese teaching.

Data Availability

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

Conflicts of Interest

The authors declare that there is no conflict of interest regarding the publication of this work.

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