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Retraction

Retracted: Text Mining of Movie Animation User Comments and Video Artwork Recommendation Based on Machine Learning

Security and Communication Networks

This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) Manipulated or compromised peer review

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

[1] H. Gong, "Text Mining of Movie Animation User Comments and Video Artwork Recommendation Based on Machine Learning," *Security and Communication Networks*, vol. 2022, Article ID 2800481, 9 pages, 2022.

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Research Article

Text Mining of Movie Animation User Comments and Video Artwork Recommendation Based on Machine Learning

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Video artworks are closely linked with the development of contemporary technology. Therefore, it is widely used in various fields of social life. Video art has become one of the main media forms of contemporary art. In the practice of art teaching, how to combine the existing content of traditional art teaching with video technology and how to understand the inner connection between traditional aesthetics and technological aesthetics have become issues that workers in the new era must think about and pay attention to. As a typical case of influencing works of art, movie animation is loved by the majority of young people. In order to quantify the application effect of machine learning in video art and film animation text mining, this paper conducts prediction research and analysis on several main aspects of color features involved in film animation. By introducing three typical machine learning methods, this paper analyzes the distribution law of the color features of film animation from the perspective of machine learning and its influence on artistic texts. Specifically, the paper uses machine learning methods as a carrier to predict the performance of multiple main modules of color features in movie animation. The prediction results show that the square of the correlation coefficient corresponding to the extreme learning machine is the largest, and the root mean square error, the mean absolute percentage error, and the median absolute error are the smallest, which shows that the extreme learning machine has the best prediction effect. Therefore, it corresponds to the best prediction. In addition, the comparison between the predicted data and the measured data shows that the relationship between the two is approximately a linear function of $y = x$. At the same time, the fitting calculation shows that the predicted data corresponding to the two main modules of the main color and the color structure in the color feature exhibit a good functional relationship of polynomial functions.

1. Introduction

Video art [1, 2] is closely related to the development of contemporary technology and is widely used in various fields of social life. Video art has become one of the main media forms of contemporary art. In the practice of art teaching, how to combine the existing content of traditional art teaching with video technology and how to understand the inner connection between traditional aesthetics and technological aesthetics have become the main problems encountered in the new era. It can be found that understanding the commonalities and differences between traditional art modeling factors and video art is one of the necessary prerequisites for video art to move from abstract concept to practice. Only on this basis can art be more deeply combined with technology to create excellent video artworks.

Video art includes flowing video, pictures, and digital art; video art is a creative method that uses the reproduction of digital products such as cameras and videos. It starts with a reproduction of an image rather than directly facing the object as in traditional painting. The components of video art include composition, scene, angle, movement, lighting, color, and other factors [3, 4]. For example, the film animation and influence artworks involved in this article are its main components.

Video works carry out comprehensive artistic creation in the field of traditional art. These art categories exist in video works as important content, which requires the support of

the theory of traditional modeling factors. Video works are static and dynamic images. It seeks the traditional modeling factors from the static and dynamic picture language and integrates the traditional modeling factors into the images. However, there is a big gap between the video works of China and developed countries such as Europe and the United States [5, 6]. The reason is that the basic skills of traditional modeling elements are not solid. At the same time, there is a lack of profound theoretical support in the creation. Digital media art is an emerging art form, which is characterized by covering a wide range of art categories and being closely related to real life. With the development of the times, digital art based on machine learning is increasingly used in work projects such as film animation text mining and video artwork recommendation.

The entry of digital elements into artistic activities is the independent choice of video art in the environment of digital media technology. With the popularization of the Internet and the continuous development of digital technology, the creation of digital image art shows a diversified tendency in many aspects. Taking the transformation of digital video art creation concepts and artistic practice as the starting point, art creators conduct in-depth discussions on the diversification of digital video art creation from the four aspects of creation, text, media, and communication.

Video art carries out artistic production activities and aesthetic activities under the condition of digital technology. It shows the continuous practice and innovation of digital video art in creative content and creative methods. The diversified creation of digital video art reflects the consciousness of the concept of artistic creation in the digital context and is the survival strategy of video art in the new historical period. At present, with the wide application of intelligent technology, intelligent algorithms, especially machine learning and other methods, are applied in the creation and practice of digital video art.

The creative subject of digital video art breaks through the creative central position of the traditional creative subject's meta-discourse. The main body of creation is from independent to scattered and from one to multiple. The final work created by digital technology for artistic production is not a mechanical reproduction under the cultural industry but a work that changes. Even, such a processing mode did not get the final work at all. Fundamentally speaking, this is caused by the diversification and gradual decentralization of creative subjects. In this case, the creative subject should be called the creative participant. The creative subject of digital video art does not shy away from the creative motive of artistic creation outside of art. The main body of traditional art creation is motivated by "feeling" and finally produces artistic and creative labor results. However, the main body of digital image art creation generally regards art creation as a link in the production process of artworks. In addition, the creative subject of digital video art has established a time-space and nonlinear creative aesthetic principle that is different from traditional art in the process of creation.

In fact, in the initial transition from works to texts, it is not the conversion itself that needs to be dealt with but the

relationship between the creative subject, the work, and the receiving subject. In the traditional sense, "text" usually refers to literary works that have not been tested by readers. However, a text is not the same as a work. It should be pointed out that the work is published, and the text is the prelude to the work. From the perspective of artistic creation, the main difference between traditional video art and digital video art lies in the degree of participation in the creation of texts. For traditional art, participation seems to exist only in acceptance. In a digital context, however, participation also exists in creation. From the technical source, the significant difference between digital video works and traditional video works is the existence of bitization. In the actual operation process, digital technology can be used to produce, present, and project video works, which is convenient for the modification, improvement, preservation, and transmission of texts. Moreover, with the assistance and blessing of machine learning, the development of video artworks is more promising.

As a manifestation of video artworks, film animation [7, 8] is favored by most people. Especially for teenagers, film animation brings joy and motivation to their growth. In China, the main consumer groups of movies and animation are still children and teenagers. There are many problems with Chinese film animation, especially the review text for film animation. These issues mainly include the following points.

First of all, TV animation and film animation are not very different in production [9, 10]. As a result, their content could not be better at engaging the audience. Secondly, children do not have high requirements for viewing places, sound effects, and playback screens. For children, watching TV animation on the sofa at home is not very different from watching animation in the theater. Therefore, no matter in content or form, there are no special viewing needs for children. To cultivate children's habit of watching movies, it is necessary to learn the experience of mature theater facilities in developed countries abroad. For example, animation theaters in the United Kingdom are usually built inside entertainment centers. When consumers choose entertainment, they usually choose to watch movies, which also increases the attraction of children to movie theaters. In order to solve the above problems encountered by the Chinese film animation industry, this paper intends to solve the problems existing in its development and cognition from the perspective of machine learning in order to improve the text mining ability of film animation users. Because the research area involved in the recommendation of video works and the text review of movie animation is too large, this paper takes the research aspect of color feature retrieval of movie animation as an example to conduct follow-up analysis and research.

2. Color Feature Retrieval of Movie Animation Based on Text Mining

The traditional movie animation material retrieval usually adopts the index-based method. However, the number of animation materials in the material library is huge, and this

method will cause a waste of manpower and time and cannot achieve satisfactory results.

In the process of making a movie, it is very necessary to quickly retrieve the required material. The traditional index-based animation material retrieval methods cannot meet the requirements of film workers in terms of efficiency and accuracy. To this end, researchers urgently need a fast and accurate way to find material [11, 12]. The content-based multimedia retrieval method can solve such problems.

International Standard—MPEG-7 provides a complete set of multimedia content description tools, further developed into content-based description and retrieval specifications. It stores the content characteristics of images or sounds in a fixed format. Animators can store animation material in MPEG-7 standard format in advance and provide it to the retrieval system to achieve the effect of fast retrieval. As shown in Figure 1, MPEG-7 mainly achieves the material mining of movie animation texts through three aspects: color features, texture features, and comprehensive retrieval.

Since the existing animation material is usually a shot, the shot is composed of a series of image frames with little visual change. Therefore, the animation material can be retrieved by retrieving key frames. In the MPEG-7 standard, color and texture descriptors are usually used to extract features of such static images. In the process of making animation, a single descriptor is used to describe the content of the animation color, and the retrieval effect obtained by the experiment is not very ideal. The main work of this paper is to combine the advantages of these two types of descriptors to conduct model experiments. The experimental results show that the precision and recall of comprehensive retrieval are improved compared with single descriptor.

As the most basic and most expressive visual feature of images, color has the characteristics of relatively clear definition and relatively easy extraction. Color-based image retrieval has also received extensive attention. In the actual operation process, the color representation of the movie animation can be represented by the color acquisition signal. As shown in Figure 2, the color signal, similar to the vibration signal, also exhibits multiple peaks and valleys. These curve extrema points represent the change threshold points for the color of the movie animation. That is, specific characterizations of several key color regions can be obtained from the results of signal analysis.

In order to clearly obtain the information contained in the color signal, it is necessary to perform signal processing on the signal. At present, the analysis methods for such nonstationary signals mainly include Fourier transform, wavelet analysis, wavelet packet analysis [13, 14], and Hilbert transform [15, 16]. Among them, the Fourier transform is mainly suitable for linear steady-state signals. However, it is not very suitable for nonstationary signals like Figure 2. Wavelet analysis breaks through the form of the Fourier transform window function, and it can change the size of the window function in real time. In this way, the wavelet transform can improve the adaptability of the algorithm to nonstationary signals. Compared with wavelet analysis, wavelet packet analysis continues to decompose the high-frequency band and improves the high-frequency resolution of the signal. But it is undeniable that the accuracy of wavelet packet analysis has a huge relationship with the choice of wavelet basis function.

The Daubechies wavelet [17, 18] series has good compactness, smoothness, and symmetry, so it is widely used in unsteady signal processing. For the same color signal, db5~db10 are used for 9-layer decomposition, respectively, and the reconstruction error is shown in Figure 3. As shown in Figure 3, the reconstruction error of db6 is the smallest, so this paper uses db6 as the wavelet basis function for subsequent research.

Assuming that an n-level decomposition of the signal with frequency ω results in $2n$ sub-bands, with each sub-band width being $\omega/2n$,

$$x(t) = \sum_{j=0}^{2^{n}-1} x_{n,j}, \tag{1}$$

where $x_{n,j}$ is the reconstructed signal corresponding to the jth frequency band of the nth layer, $j = 1,2,3,\ldots\ldots,2^{n-1}$.

Let $E_{n,j}$ represent the signal energy value corresponding to the frequency band of $x_{n,j}$ which gives the following:

$$\begin{aligned} E_{n,j} &= \int \left| x_{j,i}(t) \right|^2 dt \\ &= \sum_{k=1}^{m} \left| z_{i,k} \right|^2, \end{aligned} \tag{2}$$

where $z_{i,k}$ is the amplitude corresponding to the discrete points of the sub-band sub-band, k is the number of discrete points, and m is the length of the collected data.

The total vibration energy of the signal can be expressed as follows:

$$E = \sum_{j=1}^{2j} E_{n,j}. \tag{3}$$

The energy percentage of each frequency (T n, j) band can be expressed as follows:

$$T_{n,j} = \frac{E_{n,j}}{E}. \tag{4}$$

The signal is decomposed into 9 layers using the "db6" basis function. According to formulas (1)–(4), the wavelet packet energy calculation is carried out through the MATLAB platform. The energy percentages of the sub-bands are shown in Figure 4. As shown in Figure 4, the spectrum analysis results of the vibration signal involved in this paper show that the signal energy distribution range is large, and the main energy distribution is within 0~200 Hz. At the same time, the main frequency band of the signal energy is located within 140~150 Hz.

In order to systematically explain the application effect of the comment text of movie animation, this paper studies the color features involved in movie animation. The acquisition of color features is mainly obtained through the wavelet
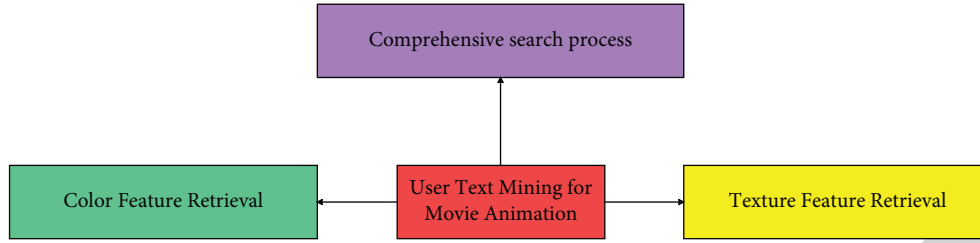
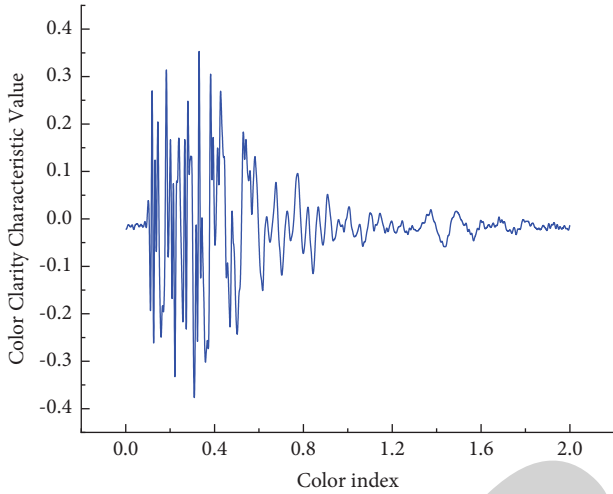Figure 1: Comprehensive retrieval process based on MPEG-7.

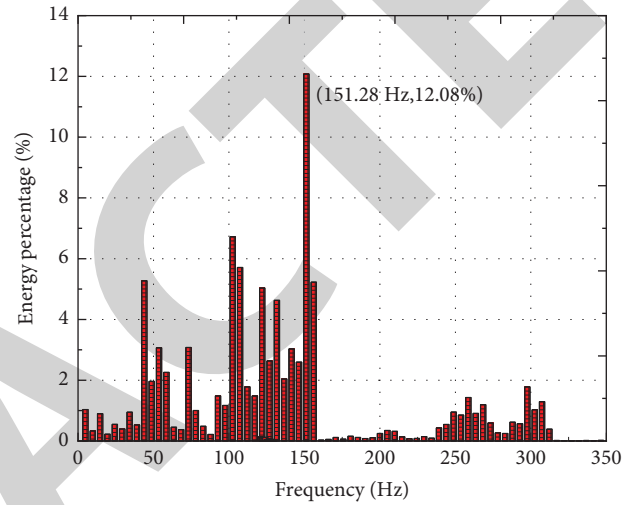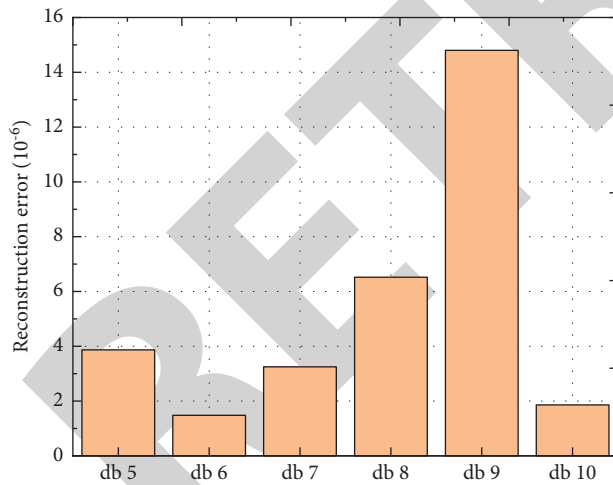Figure 2: Characteristic curve of color characterization value.

Figure 4: The energy spectrum of e signal of color.

Figure 3: Reconstruction error of wavelet packet decomposition.

packet analysis of the color representation signal. The main wavelet packet analysis process can be obtained by formulas (1)–(4).

In the production of animated movies, there are usually not many colorings, and a picture uses several or a dozen color information, and according to habits, the most important information often appears in the center of the picture. Because the primary color descriptor is mainly used to describe the distribution information of the salient colors in the image, its purpose is to provide an effective, compact,

and intuitive color representation for the region of interest. Therefore, it is most suitable for representing local salient color features.

With the third wave of artificial intelligence sweeping the world, artificial intelligence has once again become the focus of the whole society. It should be pointed out that machine learning, as a representative technology of artificial intelligence technology, is widely used in various scientific research fields. It can be found that the research on film animation evaluation from the perspective of machine learning is of great significance for systematically mining film texts and recommending works of art.

With the advent of the era of big data, various application fields are inseparable from artificial intelligence technology, especially the assistance and blessing of machine learning technology. The innovation and development of user reviews for movie animation are no exception. Artificial intelligence has the unique advantages of not being limited by time and space, fast duplication and dissemination, and rich in presentation effects. It can provide a new experience for the recommendation of video artworks and a wide range of intelligent tools and information service platforms for the evaluation of movie animations.

In the specific operation process, four types of scenery including sunset, water waves, flowers, and white clouds can be randomly selected from the scene material library in the animation material library as the research object. During the experiment, 30 key frames (representing 30 shots) were

selected for each type of scene, a total of 120 key frames, as the basic database of the experiment. During the experiment, the key frames of each type of subject scene will be used as the image to be retrieved. In addition, the database is searched using the primary color descriptor as a key.

The subsequent framework of this paper can be expressed as follows: first, several commonly used machine learning techniques can be introduced, and their arithmetic and application scopes are introduced, respectively. Then, relevant researchers take the rapid retrieval of color features in movie animation as the research goal and conduct systematic research on the involved color representation indicators. Finally, through the introduced machine learning algorithm, predictive analysis and comparison are carried out.

3. Elman Networks

As the most commonly used machine algorithm, neural network is widely used in various research fields. Among them, BP neural network [19, 20] has the widest application range. In this section, the author studies its prediction effect by introducing a branching algorithm of neural network, Elman neural network.

Neural networks are widely used for their large-scale parallel distributed structure, learning ability, and generalization ability. The main advantages are nonlinear analysis capability, convenient input/output mapping, adaptive capability, evidence response, background information, strong fault tolerance, VLSI (Very Large Scale Integrated) implementation, analysis and design consistency, and neural biological analogy. This paper takes Elman neural network as an example to describe the implementation process of traditional neural network prediction in detail.

The calculation process of the Elman network can be expressed as follows.

For the input layer, the Elman network can be represented as follows:

$$x_i^0 = x_i(k). \tag{5}$$

Here, x_0 represents the input variable of the input layer and x_k represents the output variable of the input layer obtained after the nonlinear calculation of the neural network.

For the hidden layer, the Elman network can be expressed as follows:

$$\begin{cases} s_i^1 = \sum_{j=1}^{n^0} w_{ij}^0 x_j^0(k) + \sum_{j=1}^{n^1} w_{ij}^2 c_j^0(k), \\ x_i^1 = f1\left(s_i^1(k)\right). \end{cases} \tag{6}$$

For the association layer, the Elman network can be expressed as follows:

$$\begin{cases} s_i^2(k) = x_i^1(k-1), \\ c_i(k) = s_i^2(k). \end{cases} \tag{7}$$

For the output layer, the Elman network can be represented as follows:

$$\begin{cases} s_i^3(k) = \sum_{j=1}^{n_1} w_{ij}^1 x_j^1(k), \\ y_i(k) = f2\left(s_i^3(k)\right). \end{cases} \tag{8}$$

Similarly, the implicit value in the network can be expressed as follows:

$$-\frac{\partial E(k)}{\partial w_{ij}^0} = -\sum_{l=1}^{r} \partial E(k)/\partial y_l(k) \cdot \partial y_l(k)/\partial w_{ij}^0$$

$$= \sum_{l=1}^{r} e_l(k) \cdot f2'\left(s_i^3(k)\right) \cdot w_{ij}^1(k) \cdot \partial x_i^1(k)/\partial w_{ij}^0. \tag{9}$$

Through comprehensive calculation, we can get the following:

$$\begin{cases} -\dfrac{\partial E(k)}{\partial w_{ij}^0} = \sum_{l=1}^{r} e_l(k) \cdot f2'\left(s_l^3(k)\right) \cdot w_{ij}^1(k) \cdot \chi_{ij}^i(k), \\ \chi_{ij}^i(k) = f1'\left(s_i^1(k)\right) \cdot \left(x_j^0(k) + \sum_{m=1}^{n_1} w_{im}^2 \cdot \chi_{ij}^m(k-1)\right), \end{cases} \tag{10}$$

The key to the nonlinear ability and learning ability of the network lies in the continuous correction of the weights. There are two methods for recurrent network training: one is batch mode and the other is online mode, where Elman network adopts the latter.

4. Extreme Learning Machine

Extreme learning machine [21, 22] is a special form based on support vector machine. Compared with the traditional one-dimensional support vector machine, it simplifies the prediction problem into a single-hidden-layer feedforward neural network based on the regression principle of least squares. The research results show that the prediction effect of extreme learning machine is better. In the design of extreme learning machines, researchers can use kernel functions instead of computational hidden layers that contain many nodes. The computational procedure of extreme learning can be expressed as follows:

$$e_j = \sum_{i=1}^{H} \alpha_i f\left(w_i, c_i, x_j\right) j = 1 \dots N, \tag{11}$$

where w represents the weight of the input layer and α represents the weight coefficient of the input layer. In the formula, c represents the weight coefficient of the hidden layer and X represents the input independent variable matrix.

The weight coefficients corresponding to the input layer are randomly generated. It satisfies the continuous probability distribution based on Gaussian. The weight layer of the input layer of (9) can be expressed as follows:

$$\lambda = (B + Y). \tag{12}$$

Here, B and Y represent the independent variables related to the extreme learning machine, respectively, and λ represents the dependent variable obtained by linear calculation of the independent variables.

In the formula, two independent variables and one dependent variable can be expressed as follows:

$$
\begin{aligned}
B &= \begin{bmatrix} j(x_1) \\ \cdot \\ j(x_N) \end{bmatrix} \\
&= \begin{bmatrix} g(w_1, c_1, x_1) \ldots g(w_H, c_H, x_1) \\ g(w_1, c_1, x_j) \ldots g(w_H, c_H, x_j) \end{bmatrix}, \\
\lambda &= \begin{bmatrix} \lambda_1^T \\ \cdot \\ \cdot \\ \lambda_H^T \end{bmatrix}, \\
Y &= \begin{bmatrix} y_1^T \\ \cdot \\ \cdot \\ y_N^T \end{bmatrix}.
\end{aligned}
\tag{13}
$$

5. Prediction Based on the Fuzzy Neural Inference System

The neural reasoning system [23, 24] is a system composed of three components, which mainly include (1) rule base, (2) database, and (3) reasoning system. In the fuzzy neural inference system, the input parameters consider different fuzzification and defuzzification methods and strategies and have various rules. This intelligent algorithm can choose from many sets of member functions to ensure the effect of fuzzy logic on the input data. The fuzzy inference system can be divided into three inference modes according to the "if-then rule" inference operation. These inference modes are Mamdani system, Sugeno system, and Tsukamoto system, respectively. Sugeno system is considered to be the most popular candidate for sample-based fuzzy modeling and facilitates the use of adaptive techniques. In a one-dimensional Sugeno system, a typical rule set with two computational rules for fuzzy inference can be expressed as follows:

When $x = A_1$, $y = B_1$, then the fuzzy neural inference system can get the following:

$$
f_1 = \alpha_1 x + q\beta_1 y + \eta_1. \tag{14}
$$

Here, f_1 represents the function value obtained by the fuzzy neural inference system and α_1, β_1, and η_1, respectively, represent the undetermined coefficients related to the function output.

Similarly, when $x = A_2$ and $y = B_2$, the fuzzy neural inference system can get the following:

$$
f_2 = p_2 x + q_2 y + r_2. \tag{15}
$$

Here, f_2 represents the function value obtained by the fuzzy neural inference system and α_2, β_2, and η_2, respectively, represent the undetermined coefficients related to the function output.

Figure 5 is a schematic diagram of the workflow of the fuzzy neural network prediction system.

6. The Application of Machine Learning in Movie Animation User Reviews and Text Mining

With the continuous development of information technology, animation technology is used more and more in movies. The animation special effects made by computer can already reach the level of fake and real. It is no exaggeration to say that more than 95% of modern films have animation elements to some extent.

After the production of each film, the film production company will collect useful materials to form the company's material library so as to use the previously accumulated materials when making new films, which will greatly shorten the production cycle of new films, improve work efficiency, and reduce invest. With the rapid growth of the number of materials in the material library, how to quickly and accurately find the required material in the increasingly huge material library has become a difficult problem for animators. Film animation, as a branch of film technology, also has similar problems. In order to quantify the research of machine learning technology in influencing works of art, this paper mainly uses machine learning to identify the color features involved in film animation. Based on the color descriptor in the MPEG-7 standard, this paper applies it to the retrieval of film materials and achieves good experimental results.

The feature of color is the most basic and most expressive visual feature of an image. It has the characteristics of relatively clear definition and relatively easy content extraction, so the color-based image retrieval has been widely valued and applied. Color description in MPEG-7 mainly includes main color, scalable color, color structure, color space, and color layout. The main color descriptor is mainly used to describe the distribution information of the salient colors in the image. Its purpose is to provide an efficient, compact, and intuitive color representation for regions of interest.

The color layout descriptor can represent the spatial distribution of the color semaphore in the whole image, and it has a small computational cost while searching efficiently. This descriptor supports the user's hand-drawn sketch query in the image query system, which is not available in other descriptors. It is very effective in image quick browsing and search applications. This paper adopts the method of combining manual retrieval and automatic retrieval. The searcher sets the corresponding weights according to the content of the key frame to be retrieved as the main color descriptor and the isomorphic texture image descriptor. It should be noted that the size of the weight will affect the retrieval results. Considering that the production of animation is an artistic creation, the subjective feeling of the
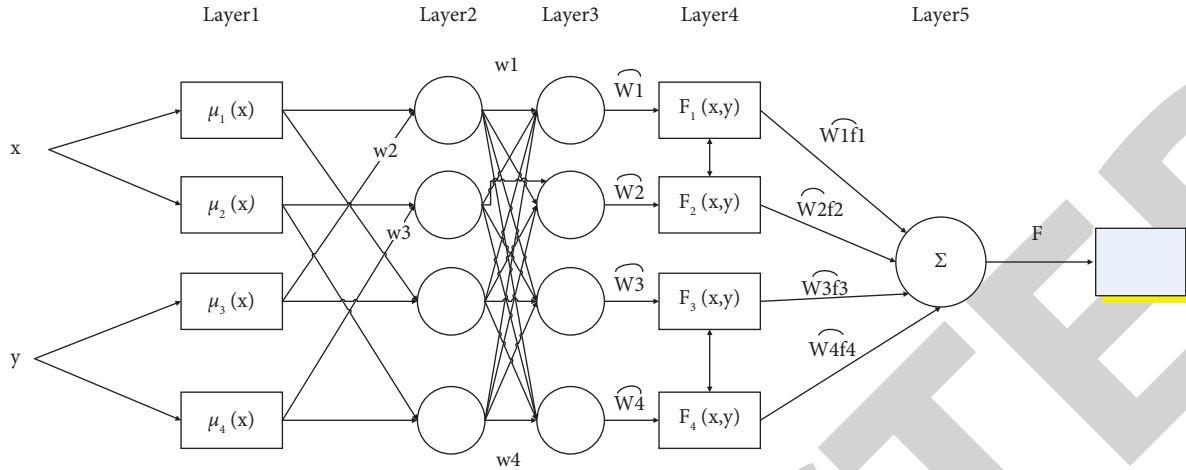
Figure 5: Elman network structure diagram.

producer also plays an important role. It is up to the producer to decide whether the key frames to be retrieved are important for color information or texture information.

Although the retrieval of animation key frames by combining color and texture features has achieved good experimental results, this method also has limitations. A large number of experimental results show that if it is a key frame of pure scenery, the retrieval effect will be better with color features. This requires the searcher to flexibly set the weights of the color and texture descriptors according to the actual situation in the search process so as to achieve better search results. In order to solve the above problems, this paper uses the three machine learning algorithms mentioned above to optimize and predict several main target values involved in the movie animation retrieval process. In order to express clearly, the three machine learning algorithms are mainly Elman networks, extreme learning machine, and fuzzy neural inference system.

Through the three machine learning methods mentioned above, the specific indicators of the five color features involved in the text mining research of movie animation reviews are predicted and studied. It is well known that the square of the correlation coefficient (R^2), the root mean square difference (RMSE), the mean absolute percentage error (MAPE), and the median absolute error (MEDAE) are several typical machine learning predictors. The next research plan is to evaluate the prediction effect of several machine learning techniques by comparing the square of the correlation coefficient, the root mean square error, the mean absolute percentage error, and the median absolute error of the three algorithms. It is well known that the closer the square of the correlation coefficient (R^2) is to 1, the smaller the root mean square error, the median absolute error, and the mean absolute percentage error, indicating higher prediction accuracy. Table 1 shows the prediction performance of the three machine learning methods of Elman networks, extreme learning machine, and fuzzy neural inference system. Among them, RMSE, MAPE, and MEDAE can be obtained by the following formula:

$$\text{RMSE} = \sqrt{\frac{1}{n} \times \sum_{i=1}^{n} \left| (y_i - x_i)^2 \right|},$$

$$\text{MAPE} = \frac{1}{n} \times \left[\sum_{i=1}^{n} \left| (y_i - x_i)/y_i \right| \right] \times 100, \tag{16}$$

$$\text{MEDAE} = \text{median} (y_i - x_i).$$

It can be seen from Table 1 that the square of the correlation coefficient corresponding to the extreme learning machine is the largest, the maximum value is 0.9851, the root mean square difference is the smallest, and the minimum value is 0.1569. This comparison result shows that the prediction effect corresponding to the extreme learning machine is the best. In addition, the prediction performance of the three machine learning techniques is ranked from strong to weak as follows: extreme learning machine, Elman networks, and fuzzy neural inference system.

At the same time, the above analysis shows that extreme learning machine can be used as a representative machine learning technology in innovative research on movie animation user reviews and text mining.

In addition, in order to more systematically evaluate the prediction effect of machine learning technology, the three-dimensional contour cloud map of the prediction data obtained based on the extreme learning machine is drawn in Figure 6. As shown in Figure 6, the prediction results of the color features involved in movie animations and video artworks obtained by machine learning have good continuity.

In order to further prove the prediction effect of machine learning technology on the color features involved in movie animation, we plot the prediction results of several feature variables of movie animation color retrieval in Figure 7. As shown in Figure 7, the functional relationship between the predicted value corresponding to the movie animation and the measured value is approximately a linear function relationship. The specific functional relationship expression is

Table 1: Comparison of prediction performance of three big data technologies.

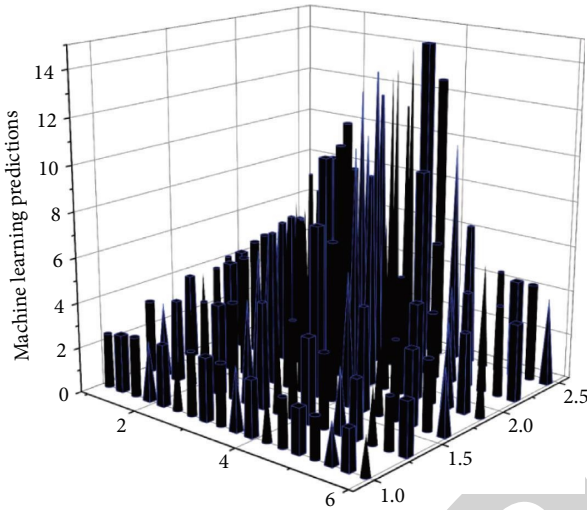| Machine learning technology	The effect of regression analysis			
	Squared correlation coefficient (R^2)	Root mean squared difference (RMSE)	Mean absolute percentage error (MAPE)	Median absolute error (MEDAE)
Elman networks	0.9238	0.2011	0.3011	0.3669
Extreme learning machine	0.9851	0.1569	0.1201	0.0990
Fuzzy neural inference system	0.8674	0.268	0.2901	0.1821

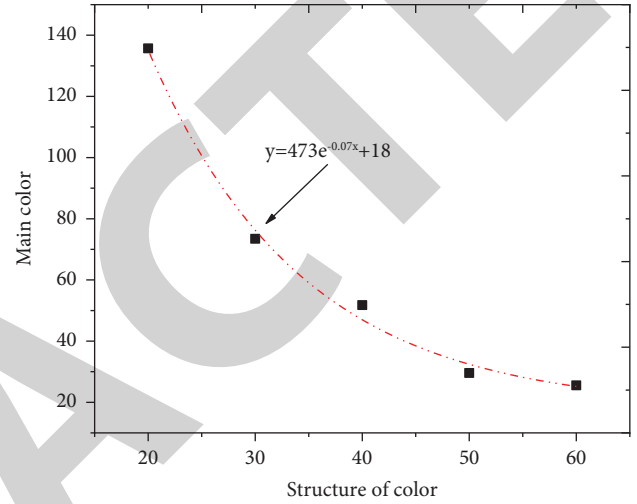Figure 6: Continuity of prediction effect based on extreme learning machine.

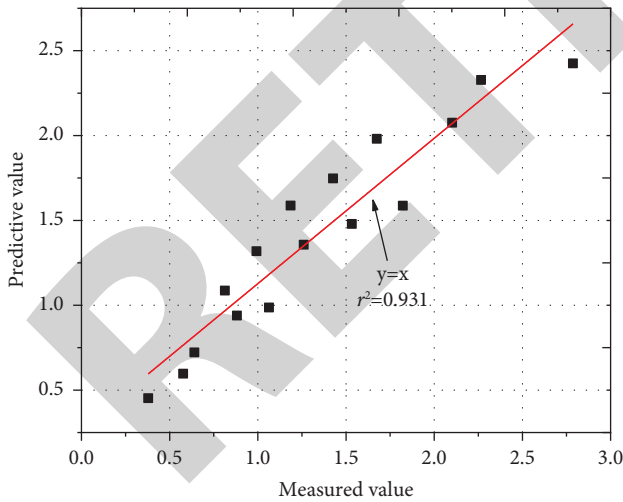Figure 8: Data fitting relationship between main color and structure of color.

Figure 7: The comparison between the measured value and the predicted value.

$y = x$. From Figure 7, we can see that the coefficient of determination between the predicted value and the measured value is 0.931, and the prediction accuracy is high.

The functional relationship between main color and structure of color is studied by means of data fitting as shown in Figure 8. As shown in Figure 8, there is a certain polynomial function relationship between the two.

7. Conclusion

Video art has technical genes since its birth, and video artworks are the crystallization of multiple creative ideas under the blessing of digital technology. It is undeniable that the interpretation of the creative concept and creative practice of digital video art from a diversified perspective is an urgently needed evaluation scale for the art theory circle in the digital age. As a special form of video artworks, film animation is loved and respected by the majority of young people. The application of machine learning in the text mining process of movie animation is promising. In order to quantify the evaluation index of movie animation, this paper uses the color feature retrieval involved in movie animation as the research to carry out machine learning. The article introduces three different machine learning techniques based on Elman networks, extreme learning machine, and fuzzy neural inference system. Then, the main aspects of main color, scalable color, color structure, color space, and color layout involved in the color characteristics of movie animation can be predicted and analyzed. The prediction effect shows that for the research cases introduced in this paper, the prediction effect obtained by extreme learning machine is the best. Its root mean square deviation is only 0.1562. The square of the correlation coefficient is the largest, and the maximum value reaches 0.9851. In addition, the comparison results between the predicted data and the

measured data show that machine learning has a better prediction effect on the performance indicators of the main modules. At the same time, the measured value and the predicted value basically satisfy the linear function relationship. Moreover, the predicted data between the dominant color and the color structure exhibit a good functional relationship of polynomial functions.

Data Availability

The experimental 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 regarding this work.

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