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Retraction

Retracted: Clustering and Analysis of Verbs in English Language Based on Artificial Intelligence

Mathematical Problems in Engineering

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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

[1] Y. Zheng and Z. Zhang, "Clustering and Analysis of Verbs in English Language Based on Artificial Intelligence," *Mathematical Problems in Engineering*, vol. 2022, Article ID 2151598, 10 pages, 2022.

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Research Article

Clustering and Analysis of Verbs in English Language Based on Artificial Intelligence

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There are related problems in the clustering and analysis of verbs in the English language. In order to further improve the application of verbs in the English language based on the theory of artificial intelligence, the clustering analysis of English verbs is carried out by using artificial intelligence technology and through the use of discrete matrix and evaluation index optimization, so as to obtain the optimized artificial intelligence model. The model can provide a good computational process for the verb clustering analysis of the English language, and the experimental data are used to verify the model. Relevant studies show that the influence of parameter change on the discrete change of the matrix can be divided into three cases: the curve shows a gentle change trend with the increase of distance; the increase of the distance makes the discrete data of the experiment increase approximately linear. The relationship between distance and discrete data is nonlinear. The change curve of MS has obvious multi-segment linear characteristics, and the linear slope of the first stage is the lowest, indicating that the change effect of the curve is the least obvious in this stage. Based on the clustering analysis of English language verbs using artificial intelligence technology, it can be seen that different factors vary in an obvious range at the initial stage and have good corresponding fluctuation characteristics. With the increase of samples, the corresponding curve gradually tends to be flat. Finally, the accuracy of the model is verified by experimental data. This research can provide a theoretical basis for the application and analysis of artificial intelligence in other fields and provide support for clustering and analysis of verbs in the English language.

1. Introduction

Artificial intelligence technology has been widely applied in different fields that is technological innovation [1], intelligent military hardware facilities [2], commercial applications [3], surgical medicine [4] and oral therapy [5]. In view of the existing problems of hardware and software facilities in the field of higher education, artificial intelligence technology was used to extract indicators of related problems in higher education [6]. By analyzing the parameters such as the numerical index and the fuzzy matrix and introducing them into higher education, the final calculation result can be obtained through the comprehensive function of the characteristic matrix and the fuzzy matrix. In order to make the obtained results more convincing, the final optimization and analysis of the obtained results should be carried out using digital indicators. The above steps and methods can be used to solve higher education problems. Finally, the extracted data should be used to verify and further predict higher education problems. Artificial intelligence plays an important role in the field of higher education, and it can also be applied to the regulation and control of national power grid. As was known to all, there were a series of complex difficulties in the actual operation of power grid regulation. If these problems were not solved, they will cause great harm to the power grid regulation. Based on artificial intelligence technology, the characteristic matrix and fuzzy parameters were imported into the original model, so as to get the targeted model parameters. In order to analyze the model parameters, they were introduced into the

corresponding calculation module, and the corresponding real-time calculation results can be obtained through the iterative calculation of the calculation module [7]. Finally, through further analysis of model parameters, the optimal solutions of power grid regulation can be obtained, and these optimal solutions can play an important role in national power grid regulation.

The above studies mainly start from the industrial field and the medical field to carry out relevant research on the existing problems. In view of the problems existing in the clustering analysis of English verbs. Based on the relevant theories of artificial intelligence, this paper introduces evaluation parameters and the fuzzy matrix with the idea of model optimization. Through the calculation of the fuzzy matrix, the changing rules of verbs in the English language can be obtained. And the method of parameter evaluation was used to further optimize and modify the obtained results, so that the obtained results can meet the requirements of practical use. Finally, in order to verify the accuracy of the optimization model, the method of data calculation was used to solve the model, and the results show that the optimization model can well meet the requirements of the test and actual use of the relevant provisions. This research can provide theoretical support for the application of the artificial intelligence model in other fields.

2. Introduction to Artificial Intelligence Technology

With advances in computing power and sensing technology over the past decade, artificial intelligence is widely used in the English language. Machine learning is a core part of artificial intelligence, and its main function is to acquire new information. The model is constantly trained to improve the generalization ability of the model, so that the computer can simulate or realize human learning behavior. Traditional machine learning algorithms and deep learning algorithms are gradually applied to the study of English verbs, and their effects are obvious and often have high detection accuracy. The core problems of artificial intelligence include building human-like or even superior reasoning, knowledge, planning, learning, communication, sensing, moving objects, using tools, and manipulating machinery. There are a large number of tools using AI, including search and mathematical optimization and logic deduction.

2.1. Artificial Intelligence Algorithm. In the artificial intelligence algorithm, the prediction time algorithm is often used to analyze the model, and the main idea of the algorithm prediction time series is as follows [8, 9].

2.1.1. Feature Sequence Acquisition. Feature sequence T_s exists in this model. K-nearest neighbor algorithm can be used not only for classification but also for regression. By finding out the k-nearest neighbors of a sample and assigning the average value of the attributes of these neighbors to the sample, the attributes of the sample can be obtained. A more useful method is to give different weights to the influence of neighbors with different distances on the sample. When m time scale data before t_n time is extracted exist, the extracted data are combined to obtain feature sequence s_n. This feature sequence contains t_n data, and the corresponding formula is shown as follows:

$$s_n = \left\{T_{n-m}, T_{n-m+1}, L, T_{n-1} \mid T_i \in T_S\right\}. \tag{1}$$

Through the above formula and correlation analysis, it can be seen that parameters m and n have a certain influence on the change of feature sequence in artificial intelligence calculation. In order to quantitatively analyze the variation rule of parameters m and n on feature sequence, the change curve of feature sequence was drawn through analysis, as shown in Figure 1. It can be seen from the figure that three different characteristic curves have typical piecewise characteristics. From the change curve of parameter m, it can be seen that with the gradual increase of independent variable, the corresponding curve first presents a change trend of slow increase. When the corresponding independent variable exceeds 0.65, the value of the corresponding dependent variable increases suddenly. With the gradual increase of the independent variable, the curve continues to show a trend of slow increase. When the independent variable exceeds 0.9, the curve gradually tends to be stable, and the main reason for parameter m jumping at 0.65 is that the model parameters show certain differences, which leads to a certain increase in the dependent variable value of the corresponding calculation results. It can be seen from the change curve of parameter n that the change trend of parameter n is basically consistent with that of parameter m, and the dependent variable curve in the initial stage is approximately coincident, which indicates that parameter m and parameter n have the same influence trend on the characteristic sequence data of the dependent variable. As can be seen from the curve of parameter s_n, with the increase of the independent variable, the influence of the two factors on the dependent variable shows a trend of gradual improvement, making the data of the corresponding dependent variable increase rapidly, but the corresponding trend is basically the same. Deep learning is used to learn the internal rules and representation levels of sample data, and the information obtained in the learning process is of great help to the interpretation of data such as text, image, and sound. The ultimate goal is for machines to be able to learn analytically, like humans, recognizing data such as words, images, and sounds.

(2) To calculate the similarity of the feature sequence of S_n and T_s at all times, there are generally several functions to calculate the similarity [10, 11]. The commonly used Euclidean distance calculation formula is adopted here, as shown in the following formula [12, 13]. The Euclidean distance between the characteristic sequence of t_n moment and t_a moment is

$$s_{na} = \sqrt{\sum_{i=1}^{m} \left(T_{n-i} - T_{a-i}\right)^2}. \tag{2}$$

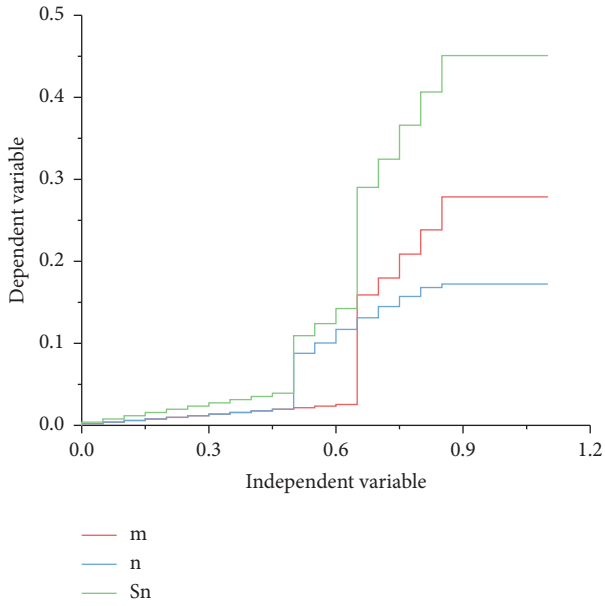

Figure 1: Characteristic sequence graph.

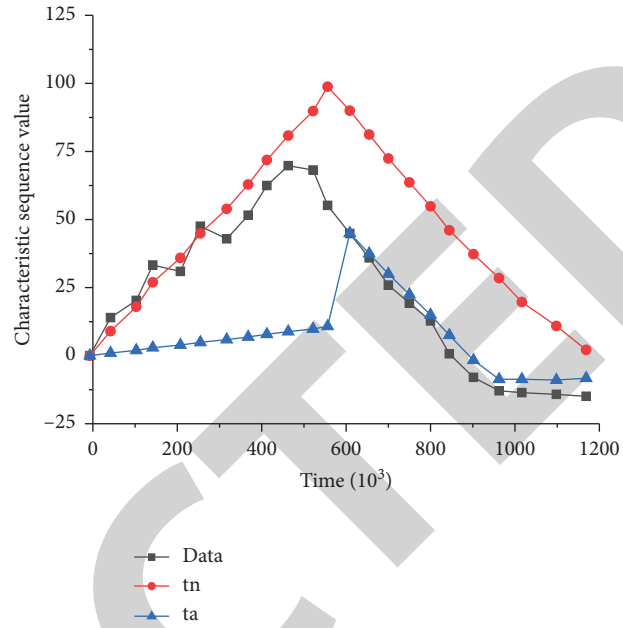

Figure 2: Corresponding curves of feature sequences at different times.

The characteristic sequence data at different moments have different changing trends. The characteristic sequence data at t_n and t_a moments also show different changing trends. In order to further analyze the change values of feature sequences at these two moments, the change trends of corresponding curves at these two moments were drawn, as shown in Figure 2. From the data in the figure, it can be seen that the two curves exhibit two typical stages, that is, with the gradual increase of the number of iterations, the corresponding feature sequence value slowly increases first and then slowly decreases. It can be seen that the change of experimental data shows that the corresponding curve shows an overall trend of gradual increase as the number of iterations gradually increases. However, it can be seen from the specific data that the experimental data has certain fluctuation characteristics in this stage. When the number of iterations exceeds 450, the corresponding curve presents an approximate linear downward trend, while when the number of iterations exceeds 800, the curve gradually tends to be flat, indicating that the experimental data have different change characteristics under different times. It can be seen from the moment t_n that this curve can better describe the changing trend of experimental data in the first stage. However, when the number of iterations gradually increases and exceeds the corresponding value of experimental data, the corresponding curve still shows a trend of rapid increase. When the number of iterations exceeded 600, the corresponding curve decreased approximately linear, and the description of the experimental data in the second stage was generally higher than the specific value. According to the data of t_a moment, the curve of the characteristic sequence value can be smaller than that of laboratory in the first stage. On the whole, it shows an approximate linear trend. In the second stage, the corresponding curve decreases gradually with the increase of the number of iterations, indicating that the two parameters can only describe the changes in a part of the feature sequence. Therefore, we should comprehensively consider the specific situation of the data in the first and second stages, so as to better describe the feature sequence data.

(3) Select the values of k moments most similar to the characteristic sequence of t_n moments, that is, the k moments with the smallest Euclidean distance to form the set A [14, 15]. Ensemble learning method is also known as a multiclassifier system, which combines multiple weak learners to complete the learning task. If it is used for classification task, it is called the ensemble classifier. Generally, ensemble learning algorithms are divided into the following categories: (1) algorithms that promote a weak learner to a strong learner; (2) parallel ensemble learning algorithm; (3) random forest algorithm.

(4) Calculate the average value T_n of all elements in set A to obtain the prediction result, as shown in the following formula:

$$T_n = \sum T_i, \quad T_i \in A. \tag{3}$$

2.1.2. Linear Analysis. Linear discriminant analysis, like principal component analysis, is a method to make the distance between samples of different categories as large as possible and the distance between samples of the same category as small [16, 17]. Linear discriminant analysis is a generalization of the Fisher's linear discrimination method, which uses statistical, pattern recognition, and machine learning methods. This method tries to find a linear combination of the features of two types of objects or events to be able to characterize or distinguish between them. Take the two-dimensional data of dichotomies as an example to explain the principle of LDA, assuming that there are two-dimensional data sets c_1 and c_2.

Step 1. Calculate the mean value as

$$\mu_i = \frac{1}{n_i} \sum_{X \in c_i} X = \frac{1}{n_i} \sum_{X_i} X_i. \tag{4}$$

Step 2. Calculate the discrete matrix of each classification calculation as

$$S_i = \sum_{X_k} (X_k - \mu_i)(X_k - \mu_i)^t. \tag{5}$$

Step 3. Calculate the intra-class discrete matrix as

$$S_w = \sum_{c=i}^{c} S_i. \tag{6}$$

Step 4. Calculate the matrix between categories as

$$S_B = \sum_{i=1}^{c} n_i (\mu_i - \mu)(\mu_i - \mu)^t. \tag{7}$$

Step 5. Obtain the maximization formula as

$$J(W) = \frac{W^T S_B W}{W^T S_w W}. \tag{8}$$

Finally, the projection of data can be expressed as

$$W = S_w^{-1}(\mu_1 - \mu_2). \tag{9}$$

By calculating the change relation of the discrete cumulative matrix, it can be seen that different parameters have a certain influence on the change of the matrix, and the discrete data has a certain fluctuation under the action of different distances. In order to further analyze the influence of the change of parameter c on the discrete matrix data, the change curves of the discrete matrix under the action of different parameters are drawn as shown in Figure 3. It can be seen from Figure 3 that the variation of the discrete matrix under the action of different parameter values has significant difference. According to different forms of curves, it can be divided into several typical features. When the parameters $c = 1$ and $c = 3$, the corresponding curve has an obvious gentle characteristic, while with the gradual increase of the distance, the corresponding curve shows a relatively constant fluctuation phenomenon, and the overall change range is relatively small. The curve with parameter $c = 2$ has a relatively consistent trend in the first half of the curve, but when the distance is equal to 18, it shows a significant decline, indicating that the curve data at this stage shows a characteristic of fluctuation. When parameter $c = 4$ and parameter $c = 7$, the corresponding curve shows obvious linear characteristics. According to the slope of the corresponding curve, it can be seen that the slope of the curve when parameter $c = 7$ is higher than that when parameter $c = 4$. It can be seen from the curves corresponding to parameter $c = 5$ and parameter $c = 6$ that these two curves have obvious nonlinear variation characteristics. The curve first

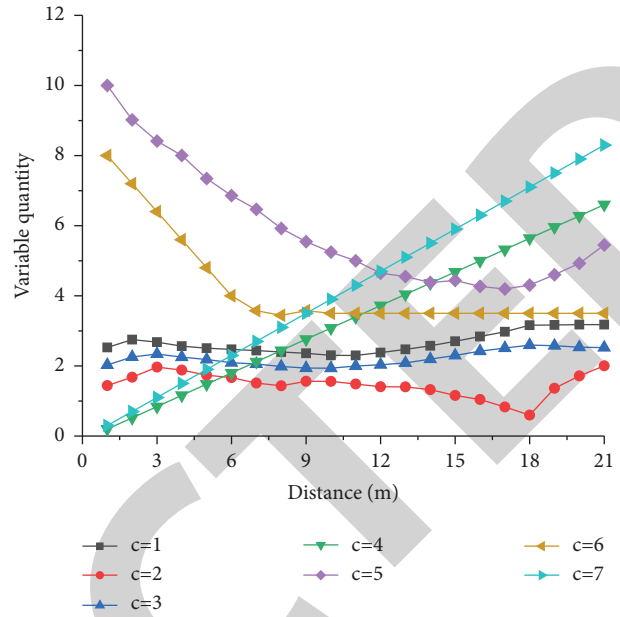

Figure 3: Graph of influence of parameter c on variation of the discrete matrix.

shows a trend of gradual decline, and when it exceeds a certain distance, the curve gradually flattens out, and there may be certain fluctuations. Through the above analysis, it can be seen that the variation of the discrete matrix under the action of different parameters will have obvious differences. Therefore, when calculating the change of the discrete matrix, appropriate parameters should be selected according to the change of specific experimental data, so that the discrete matrix can be specifically described and analyzed. The decision tree model is simple to understand and interpret, and it requires a small amount of data to prepare, while other techniques often require large data sets. However, the decision tree model has the following disadvantages: the results of the decision tree model may be unstable, and the algorithm of the decision tree model cannot guarantee to return the global optimal decision tree.

2.2. Theoretical Analysis of Artificial Intelligence. Deep learning is a sub-field of machine learning, which mainly includes the fully connected neural network and the long short-term memory neural network [18, 19]. Deep learning algorithms can use more data to improve the results of learning algorithms. For some applications, deep learning performs better on large data sets than other machine learning methods. Moreover, deep learning is more suitable for unlabeled data, so it is not limited to the field of natural language processing which mainly focuses on entity recognition.

(1) Fully connected neural network is the simplest kind of neural network, as shown in Figure 4. Each circle represents a neuron, with an input layer on the left, an output layer on the right, and a hidden layer in the middle [20, 21].

In order to further analyze the relevant theories of artificial intelligence, through the analysis of the fully

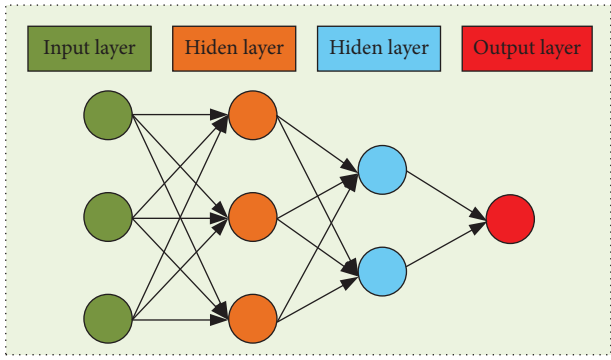

Figure 4: Schematic diagram of the fully connected neural network.

connected neural network of important theories of artificial intelligence technology, it can be seen that the fully connected neural network can be divided into three main modules according to its different functions: input module, hidden module, and output module. Two different types of hidden modules play different roles, respectively, as shown below: data can be input through the input module. Then, relevant data are optimized and analyzed through the first hidden module, so as to extract specific feature parameters, and then the feature parameters are imported into the second hidden module. The second module can carry out targeted analysis on the data, so as to obtain the optimization results under the action of artificial intelligence and then import the corresponding optimization results into the output module for output.

The input of neurons in the input layer is sample data x, and the input of neurons in other layers is the output of neurons in the previous layer, which can be calculated by the following formula:

$$z = wx + b, \tag{10}$$

where x represents the input, w represents the weight, and b represents the bias.

When calculating the artificial intelligence model, the neuron parameters of each layer should be initialized first, and then the sample data is transferred to the output layer after layer calculation. Finally, neural network training is supervised learning, that is, input x has a corresponding true value y, and the loss between the output y' of the neural network and the true value y is what the network propagates back. The training process of the entire network is the process of constantly reducing loss, which can be calculated by the following formula:

$$\text{Loss} = \sum_{i=1}^{n} \left(Aw^2 + Bb^2 + Cwb - Db - Ew + F\right), \tag{11}$$

where A, B, C, D, E, and F are constant coefficients.

(2) Long short-term memory neural network is one of the time-cycling neural network, which is a neural network used to process sequence data [22, 23]. Compared with the general neural network, it can process sequential data, but the general recurrent neural network has the problem of long-term dependence. Long short-term memory neural network has innate advantages in processing time series data. The long short-term memory neural network achieves the ability of correcting errors through back propagation and gradient descent algorithm. The unit in the long short-term memory neural network architecture is equivalent to an analog computer, which significantly improves the network accuracy.

In order to further analyze the matrix changes in the convolutional neural network, we draw the corresponding flow chart of the convolutional neural network changes, as shown in Figure 5. It can be seen from Figure 5 that the convolutional neural network can be divided into three modules. Relevant data are analyzed and optimized in the first module and then imported into the second module for further parameter calculation and iterative analysis. Then, the results of calculation and iterative analysis are imported into the third module, and the data are further optimized in the third module, and then the model results are output.

In order to improve the evaluation and analysis of artificial intelligence technology, several different indexes are selected to evaluate the artificial intelligence model. The mathematical expressions of MA, MP, MR, and MS are as follows:

$$\begin{aligned} MA &= \frac{TP + TN}{TP + TN + FP + FN}, \\ MP &= \frac{TP}{TP + FP}, \\ MR &= \frac{TP}{TP + FN}, \\ MS &= \frac{2 \times MA \times MP}{MA + MR}. \end{aligned} \tag{12}$$

The above mainly studies the relevant algorithms and theoretical analysis of artificial intelligence. In order to further evaluate the above model, we summarize four different expressions. Among them, the change of three different expression ways will have certain influence on the corresponding index. Therefore, we drew the three-dimensional change curve of the index MR under the action of three different factors, as shown in Figure 6. With the gradual increase of index MP, the change trend of the corresponding MR is gradually improved, and the corresponding increment is gradually increased, indicating that it has a certain linear change characteristic. The main reason is that the increase of MR will lead to the further improvement of matrix data, so that the corresponding MR index has an increasing trend. As can be seen from the increase of the MA index, MR gradually increases, and the corresponding MR index still shows a trend of gradual increase, but the increase rate is relatively small, which indicates that the influence of MA on MR is less than that of MP.

By analyzing and solving the transformation relations among the above indicators in MA, MP, and MR, the final change rule of indicator MS can be obtained through the corresponding relations above. It can be seen from the change of the MS index that its influence on different

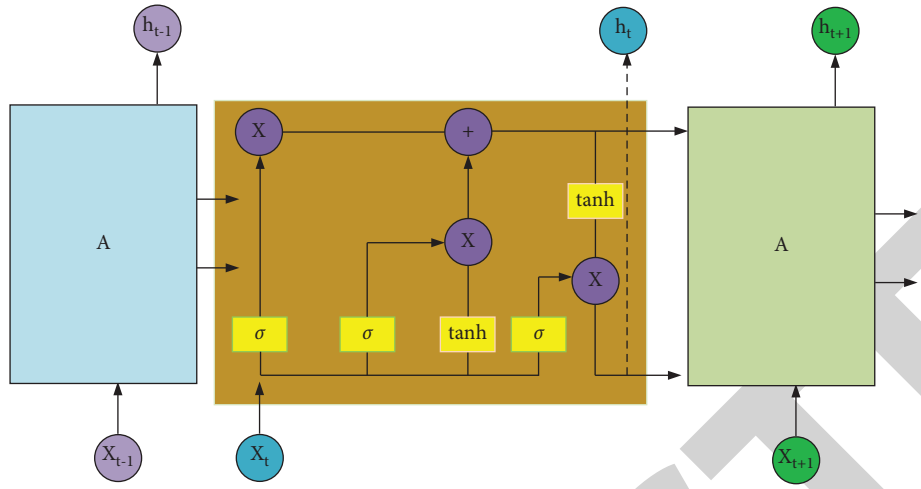

Figure 5: Matrix variation diagram.

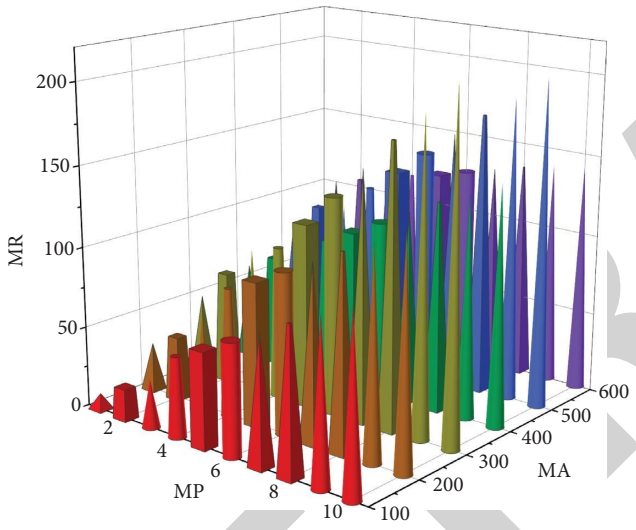

Figure 6: Three-dimensional variation diagram of index *MR*.

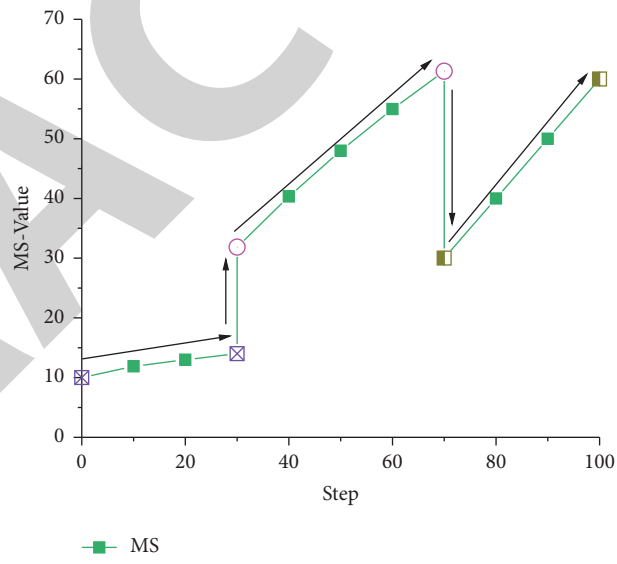

Figure 7: Indicator *MS* curve diagram.

iteration steps has different influence trends. Therefore, we summarized the variation trend of indicator *MS*, as shown in Figure 7. It can be seen from Figure 7 that the indicators corresponding to *MS* show typical multistage characteristics, and the characteristics of each stage have obvious linear variation rule. Specifically, it can be seen that in the first stage, the slope corresponding to the curve change rule is relatively small, and the overall change range is kept within 10 to 12. When the corresponding number of iterations is 30, the curve rises suddenly and then enters the second stage. In the second stage, the slope of the corresponding curve is relatively high, and when it reaches the highest value, the curve drops rapidly and enters the third stage. The slope of the curve in phase 3 is higher than that in phase 2.

3. Clustering Analysis of Verbs Based on Artificial Intelligence

3.1. Clustering Analysis of Verbs in the English Language. Verbs occupy an important position and play an important role in the English language. In order to further analyze the clustering characteristics of verbs in the English language, based on the relevant theories of artificial intelligence computing, the relevant feature matrices of artificial intelligence computing are analyzed, and different evaluation indicators are proposed to evaluate and analyze the model. In order to further analyze and explain the scale of verb clustering in English grammar, the scale of the English language usage in different periods is summarized and analyzed.

In order to quantitatively analyze the changing trend of verb use, the scale of verb use in English grammar in the past two decades is summarized, as shown in Figure 8. As can be seen from Figure 8, with the gradual increase of time, the scale of English verb usage first shows a slow increase trend, and then an approximate linear rapid increase. When it exceeds 2016, the corresponding curve tends to be gentle gradually. This shows that with the increase of time, the corresponding verb scale shows a nonlinear change trend. In order to further quantitatively analyze the changing trend,

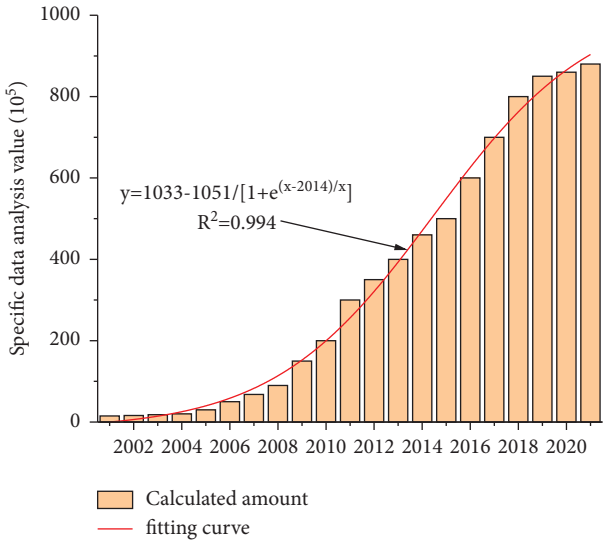

Figure 8: Scale of verb use.

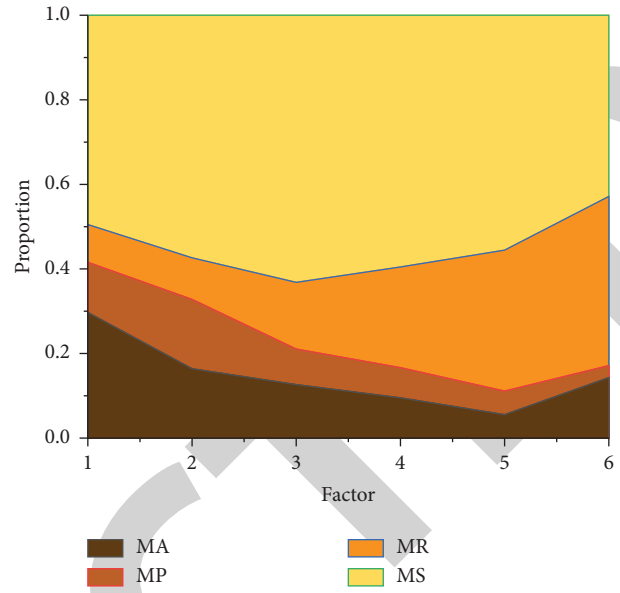

Figure 9: The proportion of verbs under different factors.

the optimization function was used to fit the model, and the fitting result was relatively good. This nonlinear equation can be used to fit the model. It can be seen from the above analysis that with the increase of time, the curve gradually tends to be gentle, indicating that there are certain problems in the use of verb clustering analysis. In order to further improve and develop the scale of verb use in English grammar, it is necessary to make a specific analysis of this problem.

The verb evaluation of the English language needs to adopt different indicators for quantitative analysis. Six different types of indicators are obtained by summarizing: (1) action verbs, (2) series verbs, (3) auxiliary verbs, (4) modal verbs, (5) prototype verbs, and (6) verb tenses. In order to further analyze the change rules of English verbs, we made quantitative calculations on six different indicators of English grammar, and four indicators based on artificial intelligence technology were used to analyze the change of English verbs, thus obtaining the verb proportion curve under the action of six factors, as shown in Figure 9. It can be seen from Figure 9 that with the gradual increase of verb factors, the proportion curves of different indicators have different changing trends. With the gradual increase of factors, the corresponding index *MA* shows a trend of gradual decline. At factor 5, *MA* reached the lowest level, while with the further increase of the index, the corresponding *MA* gradually increased. The corresponding *MP* value has a similar trend with the *MA* curve, but the corresponding proportion is higher than *MA*. With the increase of the factor, the *MR* curve shows an approximate *U*-shaped trend, reaching the lowest value when the factor is 3 and the highest value when the factor is 6. The corresponding proportion of *MS* is the highest on the whole, which indicates that *MS* has the greatest influence on the six factors, so the proportion of *MS* should be considered comprehensively.

3.2. Clustering Analysis of Verbs in the English Language by Artificial Intelligence. The introduction of artificial intelligence into the calculation and analysis of English language can explore the calculation process of artificial intelligence in English language [24, 25]. Through the extraction of feature parameters and calculation of the feature matrix, the flow chart of clustering analysis of English language verbs under the effect of artificial intelligence is obtained, as shown in Figure 10. The computational process under the action of artificial intelligence can be divided into four modules as a whole: pattern recognition, natural language processing, human-machine exchange, and machine learning modules. The pattern recognition module mainly includes gesture control, automatic recognition, other applications, verb parts, and virtual assistant. The gesture control communicates with the man-machine switch module, and the virtual assistant communicates with the natural language processing module. The man-machine switch module mainly controls the application of emotional computing and artificial intelligence computing, and the emotional computing module is comprehensively processed with machine learning. In the third machine learning module, AI techniques can be analyzed through platform tools and recommendation engines. Other applications can be corresponding to the natural language processing module, which mainly includes clustering analysis of verbs, speech recognition, and speech translation. These four modules constitute the verb analysis process of the English language under the effect of artificial intelligence technology.

The clustering analysis process of English grammatical verbs based on artificial intelligence technology is described above. Six different factors can be used to analyze the action clustering in English language, which can further enhance the application prospect of artificial intelligence and other technologies in English language. By using artificial intelligence technology to analyze the verbs of English grammar in 1300 sample data and by analyzing and summarizing, the change curves of clustering analysis of English grammar verbs under the effect of different factors are obtained as shown in Figure 11. It can be seen from the change curves of

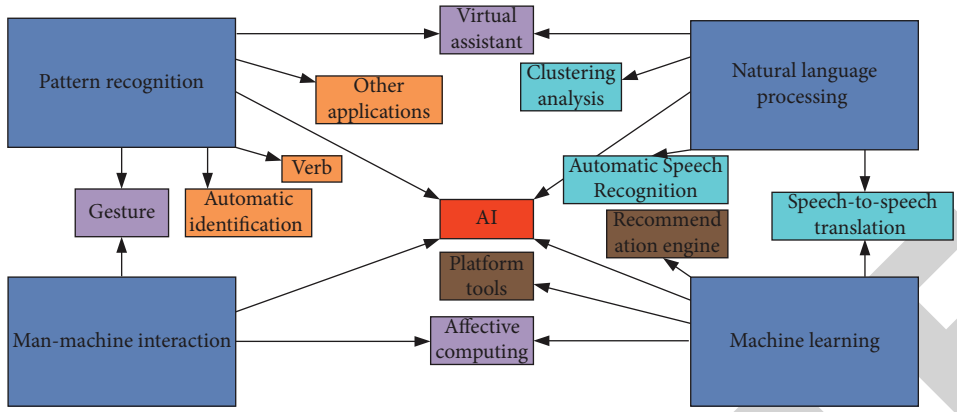

Figure 10: Flow chart of English verb analysis based on artificial intelligence technology.

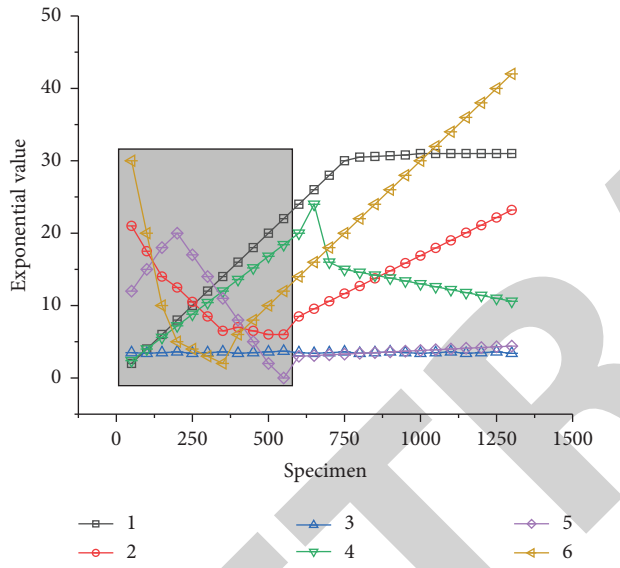

Figure 11: Clustering analysis curve of English language verbs using artificial intelligence.

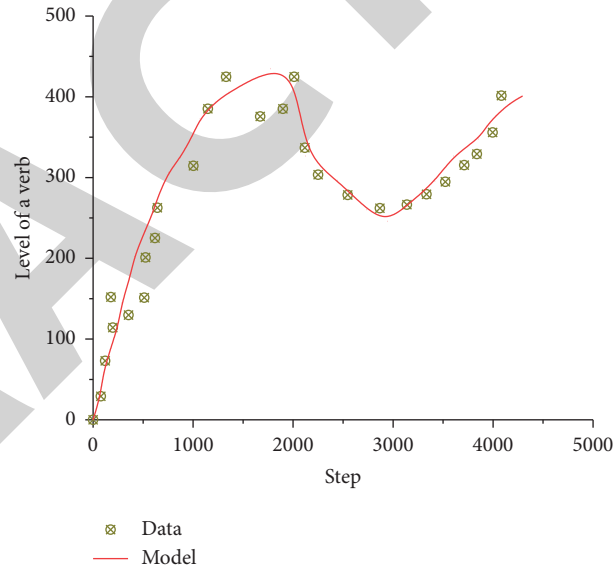

Figure 12: Verb cluster analysis prediction graph.

the six factors in the figure that the curves corresponding to different factors show different change trends with the gradual increase of samples. It can be seen from factor 1 that with the gradual increase of samples, the corresponding curve first presents a linear change trend, that is, when the sample is relatively low, the corresponding curve gradually increases, and the slope of the curve is approximately constant. However, when the sample exceeds 750, the curve tends to be flat and the variation range is relatively small. It can be seen from the change curve of factor 2 that with the increase of the number of samples, the curve presents a relatively rapid downward trend; when it reaches the lowest point, the curve presents a gradual increase with the further increase of samples. From the change curve of indicator 3, it can be seen that the overall change range of indicator 3 is about 4.2, which indicates that the influence of the indicator on verb clustering analysis is relatively stable. It can be seen from the change curve of factor 5 that it first shows a rapid linear increase, then gradually decreases when it reaches 240 samples, and then gradually tends to be gentle with the increase of samples. This indicates that the overall fluctuation of the curve corresponding to factor 5 is relatively high, and the curve gradually tends to be flat when the sample is high. From factor 6, it can be seen that the curve drops rapidly at first and then presents a change trend of approximately constant linear increase. From the above analysis, it can be seen that different factors fluctuate greatly when the sample is small, while the corresponding fluctuation is relatively small when the sample is high. Therefore, in the calculation of verbs under the action of different factors, the sample size should be considered comprehensively in clustering analysis to obtain accurate results.

4. Discussion

From the above analysis, it can be seen that artificial intelligence computing can describe the clustering analysis of verbs in the English language under different factors and indicators, and different indicators and factors have different

trends. This shows that based on the theory of artificial intelligence, the method of the feature matrix and the evaluation index is relatively good for English verb clustering. In order to quantitatively illustrate the superiority and accuracy of this model, the optimized artificial intelligence model technology is used to analyze and calculate verbs in the English language, and the calculation results are summarized as shown in Figure 12. According to the data changes in the figure, it can be seen that the change of verbs in the English language presents an approximate linear trend at first. With the increase of the number of iterative steps, the corresponding English index reaches the maximum value. When the English index reaches the highest value, it tends to decline gradually and presents a U-shaped trend. This shows that the verb changing in English language has obvious nonlinear characteristics with the increase of the number of iterations. The corresponding model curve can better describe the nonlinear change of the verb by introducing the characteristic matrix, and the description result is relatively good on the whole. This shows that the model based on artificial intelligence can analyze verb clustering in the English language. The reasons for model errors mainly include error of experimental equipment. Different data inputs will lead to certain differences in the data produced by experimental equipment. To estimate the error of the model, a good artificial intelligence algorithm model can better fit the law between the data. If the amount of data is insufficient, the generalization performance of the model will decrease.

5. Conclusion

(1) It can be seen from the change curves of parameters m and n that m and n have a consistent change trend at the initial stage of independent variable change. With the increase of the independent variable, the difference of corresponding curves becomes more and more obvious, and the curve corresponding to parameter S_n can be regarded as the result of the joint action of the two parameters.

(2) The characteristic sequence curves at different times are obviously segmented, that is, gradually increase to the highest point first and then gradually decrease. By analyzing the results, it can be seen that the curve corresponding to t_a moment can describe the first stage of data. The curve corresponding to t_n moment can describe the second stage of the test data. This shows that the two kinds of time have typical change characteristics, and the test data can be carried by local analysis.

(3) With the increase of *MA* and *MP*, the corresponding change curve of the *MR* index shows a gradual increasing trend. However, the increase range has changed, and it can be seen from the analysis that *MP* has a relatively large impact.

(4) As the number of iterations gradually increases, the corresponding *MS* curve shows a linear increase trend for multiple segments, and the slope of linear increase is different. Stage 3 has a higher linear slope than stage 1 and stage 2. The results show that the *MS* curve of the third stage varies widely with the increase of iteration times.

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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