*Retraction*

# Retracted: Construction and Application of iWrite Artificial Intelligence Evaluation System for College English Writing

## 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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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) 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] L. Jian, "Construction and Application of iWrite Artificial Intelligence Evaluation System for College English Writing," *Security and Communication Networks*, vol. 2022, Article ID 1511153, 8 pages, 2022.

WILEY | Hindawi

*Research Article*

# Construction and Application of iWrite Artificial Intelligence Evaluation System for College English Writing

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The traditional English writing evaluation is an artificial way to judge, which is a relatively subjective evaluation method. Also, the artificial method has the defects of low timeliness and high error rate, which limits the interest of college students in English learning. If the content of college students' English writing cannot be judged, it also limits their understanding of the correctness of the English language, because English writing can reflect problems such as English grammar, sentence structure, and emotional expression. Artificial intelligence (AI) technology has developed rapidly, and it can efficiently process the data of research objects. If artificial intelligence technology is combined with English writing evaluation, it can improve the timeliness and error rate of college students' English evaluation. This is also an innovative way of judging college students' English writing. Combining the characteristics of great learning English writing and judging criteria, this research uses artificial intelligence technology to design an efficient judging platform. It needs to use a convolutional neural network (CNN) and long-short-term memory (LSTM) neural network to extract features of grammar, sentence patterns, and emotional expressions of college students' English writing. The research results show that CNN and LSTM methods have high feasibility and accuracy in extracting grammar, sentence patterns, and emotional expressions of college students' English writing. The prediction error of the college students' English writing evaluation system is also within a reasonable range. CNN and LSTM methods have high accuracy in predicting English rectangle, grammar, and emotional expression, and the largest prediction error is only 2.91%. Also, the three prediction errors are distributed within 3%.

## 1. Introduction

English has always been the universal language of the world, and the status of English in international communication is self-evident. In China, it has a long history of carrying out English teaching research [1, 2]. English teaching mainly includes grammar, sentences, and writing. Writing in English is an important way to master grammar and sentence patterns in English. Writing in English is similar to writing in Chinese [3]. As long as Chinese students can write effectively in English, they can master basic English grammar as well as important sentences. This is also a basis for the realization of English listening and speaking communication. Therefore, in the teaching process of college English, English writing is an essential stage. Although the writing of college English is important, the evaluation of English

writing is also an important part [4, 5]. Only by correctly judging the English writing of college students can college students master English grammar and sentence patterns. If teachers fail to judge college students' English writing in a timely and accurate manner, they will not only lose college students' interest and confidence in learning but also cause college students to not grasp English-related knowledge in a timely manner. In the long run, if the college students' English writing cannot be judged, it will also lead to the loss of English knowledge. College students are also part of the construction of the motherland, and college students will participate in the task of national construction in a timely manner. Therefore, for college students, the mastery of English knowledge and the level of English writing will also determine their contribution to the country [6, 7]. This is because today's society is an international society, and

English knowledge is involved in every field. English writing is an important way to master English listening and speaking. Therefore, only when college students master the core essentials of English writing can they truly master the content of English and the important knowledge of audio-visual and listening. English writing is composed of sentence patterns and basic grammar, and it also contains more complex sentence patterns. Also, English writing often contains emotional expressions. It can be said that English writing includes more knowledge of English. From this point of view, the evaluation of college students' English writing is also a crucial part. The English writing level of college students is important both from a personal perspective and from the perspective of national needs. In order to improve the English writing level of college students, an efficient and accurate English writing evaluation standard is needed. There are great differences in the artificial English writing evaluation methods, and this method has the characteristics of slow aging. The artificial intelligence method brings a new way of thinking to the judgment of college students' English writing, which is efficient and accurate. The artificial intelligence method is a relatively mature method, and it can better handle the tedious data relationship in English writing. After a lot of studies, it can grasp the relationship between the characteristics of English writing and the evaluation system.

Artificial intelligence is a field that has developed rapidly in recent years. The artificial intelligence method is a relatively large field, and it has been widely used in people's production and life [8, 9]. The most important applications are image recognition, language recognition, and game development. Artificial intelligence can replace people's production and life tasks, and this method has higher timeliness than manual methods. And the artificial intelligence method has no rest time, it can work continuously, and the efficiency is still relatively high. However, the essence of artificial intelligence is that it needs a lot of data to support [10, 11]. Although the development of artificial intelligence has gone through a long time, the real use of artificial intelligence began in the early twenty-first century. This is mainly due to the rapid development of computer performance and hardware equipment during this period [12]. The development speed of artificial intelligence technology is mainly due to the development speed of the computing power of computers. Therefore, the requirements of artificial intelligence technology for computers and hardware equipment are relatively high. The development of artificial intelligence was initially based on simple perceptrons and machine learning algorithms. These algorithms have relatively weak mapping capabilities, and they can only handle simple intelligent tasks, which require low computing performance of computers [13, 14]. With the rapid development of the economic level and technological level, a huge amount of data has been derived here. This requires the emergence of more intelligent algorithms for artificial intelligence. In recent years, artificial intelligence technology has mainly developed some algorithms related to deep learning technology, which mainly include convolutional neural networks (CNN), long and short-term memory (LSTM) neural networks, and reinforcement learning. The intelligent system of English writing mainly involves three features: grammar, sentence pattern, and emotional expression. LSTM can handle sentence patterns and temporal features of emotional expressions. CNN can handle the mapping relationship between three kinds of features and the evaluation system.

If artificial intelligence technology is applied to the judgment task of college students' English writing, it can not only improve the accuracy of judgment but also improve the efficiency of judgment. Artificial intelligence technology can effectively solve the problems of low efficiency and high error rate existing in manual methods. Also, the judgment of college students' English writing is a relatively subjective problem. Artificial intelligence methods can make effective and real judgments from the aspects of English grammar, sentence patterns, and emotional expression. This is a more efficient and authentic judgment method for English writing. At the same time, artificial intelligence methods can use a lot of English learning experience to judge college students' English writing. It can map the nonlinear relationship between English writing and judging indicators. It can fully tap the nonlinear characteristics of grammar, sentence patterns, and emotional expression of college students' English writing. In a word, the application of the artificial intelligence method in college students' English writing evaluation is a relatively new scheme.

This research mainly uses the CNN and LSTM algorithms in artificial intelligence technology to conduct intelligent judgment research on college students' English writing. CNN and LSTM methods are two important algorithms in the field of artificial intelligence. These two methods are also mainly utilized to deal with the spatial and temporal characteristics of the research objects. It mainly extracts the characteristics of grammar, sentence patterns, and emotional expression of college students' English writing. This study carried out related research from the following five aspects. The research significance of college students' English writing assessment and the development of artificial intelligence methods are illustrated in Section 1. Section 2 mainly introduces the current research status of college students' English writing. The third section analyzes the working principle of the intelligent judgment system and the main algorithm of college students' English writing. Section 4 mainly analyzes the feasibility and accuracy of the application of CNN and LSTM algorithms in college students' English writing intelligent evaluation system. This study uses parameters such as error scatter plot, error area plot, and average error distribution plot to introduce the accuracy of CNN and LSTM methods in predicting three characteristics of English writing. Section 5 provides a summary analysis of the entire study.

## 2. Related Work

College students' English writing is related to students' learning of English grammar, sentence patterns, and other audio-visual content. The English writing level of college students can reflect the overall level of college students'

English. Therefore, the evaluation of English writing is an extremely important part. Many studies have been conducted on college students' English writing. At the same time, finding a fair and reasonable way of judging college students' English writing is also an extremely needed direction. Wang [3] believed that the traditional English writing evaluation model has already many drawbacks with the continuous progress of technology and hardware equipment. It proposes an automated judging mode for English writing based on an automated scoring system. Also, he put this automatic system into practice and application in the teaching of college English. The research results show that this automated scoring system and correction network can effectively improve the overall level of English teaching, and it can also improve the authenticity of English writing judgments. This system can also stimulate interest in learning English and writing in English. Wu [15] has also found that accurate evaluation of college students' English writing will increase college students' interest in English learning, and it will also increase college students' interest and hobbies in English writing. It uses the method of college dynamic English writing evaluation and artificial intelligence technology to propose an intelligent English writing evaluation method. The research results show that the intelligent dynamic college English writing evaluation system designed in this study can improve students' interest in writing, and it increases by 37.8%. Once students' interest in English writing increases, it will increase students' interest in learning English. Ran et al. [16] discovered the importance of English writing. It uses advanced recommendation algorithm to design a new type of English writing training strategy in order to improve the level of English writing. The first item of this research is that learners need to realize the cultivation of English writing mode according to the recommendation algorithm. This mode can also help students reduce the error rate of grammar and sentence structure in the English writing process. The recommendation algorithm of this mode is also continuously optimized and updated. The research results show that this model can improve the accuracy of English writing and can effectively help students improve their English writing level. This is also a model worth promoting. Sun et al. [17] mainly studied the relationship between college students' English writing and self-regulation strategies, which aims to improve the level of English writing. It investigates the relationship between effective English writing and self-regulated learning strategies in multiple institutions by means of questionnaires. The results show that college students rarely use self-regulation strategies in the process of English writing. But self-regulation strategies will improve the level of college students' English writing. This study hopes to incorporate this strategy into college English classrooms in the future. Zhang et al. [18] believe that college English teaching guidelines raise unique challenges and higher demands on college students' English writing. The quality of English teaching can be reflected by the level of English teaching. However, he found that the ability of college students to write in English is not optimistic. He used data mining to study the level of college students' English writing. Also, he combined the current

situation of foreign English writing to fully explore the relationship between college students' English writing and student behavior. This research can provide some reference and decision-making for college students' English writing teaching. Li et al. [19] found that there are problems such as weak evaluation performance and low reliability of evaluation models in college students' English writing. He uses AHP to solve these two problems in English writing. From the perspective of students, he established the analytic hierarchy process and the Grey theory model to judge the problems of English writing. It also builds a teacher evaluation model. The results of the study show that this theoretical model can improve the teaching quality of English writing in teaching, and it can also improve the English writing level of students. This research has certain significance for guiding college students' English writing. This study uses CNN and LSTM methods to design an intelligent review system for English writing. Most of the current research rarely involves such an intelligent writing review system. This has more significance for the teaching of English.

## 3. Application of AI in College Students' English Evaluation and Algorithm Principle

*3.1. The Significance of AI Technology.* This study uses CNN and LSTM neural network technology in AI technology to study the feasibility of intelligent evaluation of college students' English writing. CNN technology is mainly used to extract the features of grammar and emotional expression in college students' English writing. Sentence patterns are similar to feature recognition in the field of language recognition, so this study uses LSTM technology to extract the temporal features of sentence patterns in English writing. In this study, these two neural network algorithms are efficiently integrated. It will obtain some knowledge related to college students' English writing through a large amount of training data, which will obtain the corresponding weights. When the model is trained and matured, it can be applied to identify and feature the content of college students' English writing. Compared with the method of manually judging the content of English writing, this method saves more time and has a lower error rate. At the same time, it will have a more respectable criterion. The application of AI technology in college students' English writing evaluation system is a relatively new and innovative research, and this is also a development direction of college students' English writing evaluation [20]. It can also substitute for teachers to solve some tedious tasks of judging English writing.

*3.2. System Design and CNN Algorithm for AI to Judge English Writing.* The ultimate goal of this research is to realize the intelligent judgment of college students' English writing. It will learn some prior knowledge according to the standards and criteria of a large number of college students' English evaluations, which can get some optimal weights and biases. This research mainly uses CNN and LSTM methods to extract three main features of grammar, sentence

pattern, and emotional expression in college students' English writing. In order to realize this intelligent English writing evaluation system, this research designs an intelligent English writing evaluation system according to the data form and demand. Figure 1 shows the design process of the intelligent English writing evaluation system. The data of grammar and sentence pattern-related features of English writing used in this study are mainly collected by a camera system, which will collect these features in the form of pictures. It then uses data preprocessing algorithms for further processing. The characteristic data of sentence patterns, grammar, and emotional expressions of English writing are collected in the form of pictures, and then, these pictures will be converted into the format of data values by matrix processing. First of all, the first step of the intelligent system needs to learn a large data set of college students' English writing, and it will use CNN and LSTM methods to learn the empirical knowledge. This experiential knowledge will include English grammar and sentence patterns as well as emotional expressions. Sentiment expressions in English are feature extraction based on experience with a large dataset. These datasets need to be preprocessed before being input into CNN or LSTM neural network. The preprocessing of the data is to normalize the data of the three characteristics of English writing, which will be in the same distribution and the same interval of feature data, which is helpful for the learning process of CNN and LSTM. When the intelligent algorithm training of this system is completed, the intelligent system can use the data acquisition system to continuously collect the content of college students' English writing in real time to carry out the evaluation task of college students' English writing. The output of this intelligent system will be the judging specification or judging score of English writing. Through this intelligent system, the nonlinear relationship between the three characteristics of English writing and the scores is established. The teacher can get the predicted value only by inputting the content of English writing in the testing stage of CNN and LSTM. Teachers can only collect students' English writing content through the camera collection system. It can output the corresponding evaluation level.

It can be seen from Figure 1 that the key algorithms of college students' English intelligent system are CNN and LSTM algorithms. CNN will be responsible for extracting the grammar and sentence pattern features of college students' English writing content. The advantage of CNN is to extract the spatial features of the data, but its disadvantage is that it cannot extract the temporal features of the data. At present, most researchers have mixed the two algorithms, which will make full use of the advantages of the two algorithms. However, the hybrid CNN-LSTM algorithm still suffers from certain drawbacks in the computational time approach, because the task of extracting features of CNN and LSTM is run separately. CNN algorithms or their variants have been widely used in many fields. It can be built quickly with the help of a neural network platform, and it also allows for deeper builds. The use of CNN is more convenient and fast. The CNN method has better timeliness than the LSTM method. Therefore, applying CNN neural network to the

feature extraction task of college students' English writing can not only extract features quickly but also improve the timeliness of feature extraction.

For the calculation of CNN, the derivation operation is an essential part. In the computing platform of the neural network, the derivation operation of CNN will be performed by automatic differentiation technology. The derivation operation of each step can be performed by using the chain derivation rule, which saves a lot of computing time. Equation (1) shows the process of the weight derivation operation.

$$\Delta\omega_{ji} = -\eta\frac{\partial E}{\partial\omega_{ji}}. \tag{1}$$

In the calculation process of CNN, this will involve the loss function. The purpose of the loss function is to calculate the error between the predicted value and the actual value. This error is what guides the direction of gradient descent. Each layer of CNN involves the calculation of loss function. Figures (2) and (3) show the calculation rules of the loss function in each neural network layer, which mainly involves the derivation of weights and biases.

$$E = \frac{1}{2}\sum_{k=1}^{m}\left[d_k - f\left(\text{net}w_k\right)\right]^2$$
$$= \frac{1}{2}\sum_{k=1}^{m}\left[d_k - f\left(\sum_{j=0}^{n}\omega_{jk}y_j\right)\right]^2, \tag{2}$$

$$E = \frac{1}{2}\sum_{k=1}^{m}\left[d_k - f\left(\text{net}w_k\right)\right]^2,$$
$$= \frac{1}{2}\sum_{k=1}^{m}\left[d_k - f\left(\sum_{j=0}^{n}\omega_{jk}y_j\right)\right]^2, \tag{3}$$
$$= \frac{1}{2}\sum_{k=1}^{m}\left[d_k - f\left[\left(\sum_{j=0}^{n}\omega_{j\kappa}f\left(\sum_{j=0}^{q}u_{ij}\chi_i\right)\right)\right]\right]^2.$$

Equation (4) shows how the CNN input layer is computed. The input layer will perform a convolution operation with the input data $X$, and void indicates that the missing data will be filled with the padding method.

$$V = \text{conv2}\left(W, X, ''vali''\right) + b. \tag{4}$$

Equation (5) shows the computational equation for the output layer of the CNN. The data of the output layer have gone through the feature extraction process of the convolutional layer and the pooling layer. These will be output through the output layer through the activation function.

$$Y = \phi(V). \tag{5}$$

Equation (6) shows the operations between convolutional layers and convolutional layers, and the convolutional operation will involve flip operations.
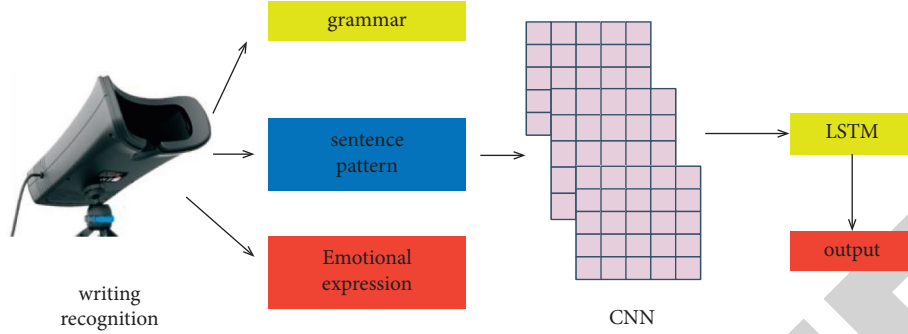
FIGURE 1: Application of CNN and LSTM methods in intelligent English writing evaluation system.

$$\delta^{l-1} = \text{conv2}\big(\text{rot180}\big(W^l\big), \delta^l, '\text{full}'\big)\phi'\big(v^{l-1}\big). \qquad (6)$$

*3.3. Application of LSTM Algorithm in English Writing Feature Recognition.* When the grammar, sentence pattern, and emotional expression of college students' English writing are extracted by CNN, it needs to be extracted by the LSTM algorithm. The features of sentence patterns and emotional expression are similar to speech recognition, and there will be more temporal features here. Figure 2 shows how the LSTM algorithm works. Compared with the CNN algorithm, the LSTM algorithm has a relatively long calculation time. However, its gate structure can selectively filter the historical state, which can ensure the continuation of historical state information. The LSTM method has 4 gate structures, which can assign weights to the eigenvalues of English writing information at different times. These weights are the basis for each gate structure to open or close.

The input gate is the first gate of the LSTM algorithm, and it will use the historical state information and current state information of the input English writing feature selected by the size of the weight. Equation (7) shows the calculation criteria for the input gate of the LSTM algorithm.

$$f_t = \sigma\big(w_f \bullet [h_{t-1}, P_t] + b_f\big). \qquad (7)$$

Equations (8) and (9) show the calculation criteria for the forget gate of the LSTM algorithm. The forget gate will use the size of the weight to filter the selection of historical information. It only passes information related to current state information.

$$i_t = \sigma\big(\omega_i \bullet [h_{i-1}, P_t] + b_i\big), \qquad (8)$$

$$\widetilde{C}_t = \tanh\big(w_c \bullet [h_{t-1}, P_t] + b_c\big). \qquad (9)$$

The output gate is the last gate channel of the LSTM algorithm, which inputs useful state information to the next layer of the neural network through the output gate. Equations (10) and (11) show the calculation criteria for the output gate, and the activation function is also involved here.
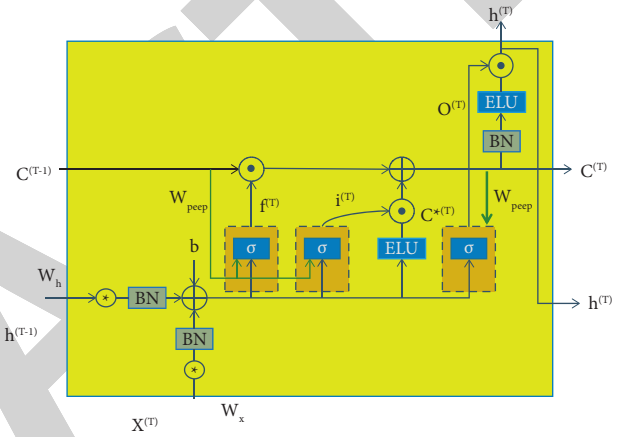


FIGURE 2: Application of LSTM algorithm in English writing feature recognition.

$$O_t = \sigma\left(w_o \bullet \left[\overrightarrow{h}_{t-1}, P_t\right] + b_o\right), \qquad (10)$$

$$\overrightarrow{h}_t = O_t \times \tanh\left(\overrightarrow{C}_t\right). \qquad (11)$$

## 4. Result Analysis and Discussion

This research mainly designs an intelligent college English writing evaluation system, which mainly adopts CNN and LSTM algorithms. The CNN algorithm will extract the features of grammar and sentence patterns of college students' English writing. The LSTM algorithm will extract the temporal features of written sentence patterns and emotional features. Such an intelligent system will save teachers a lot of judging time. Before this system can be successfully applied, it requires a large dataset to train. This study uses the data of college students' English writing in many colleges and universities in Wuhan for training. The input of these data will contain the grammar, sentence pattern, and emotional characteristics of the writing. The output is the judging score or judging criteria for English writing.

This study firstly analyzes the average errors of CNN and LSTM in predicting the grammar, sentence pattern, and emotional characteristics of college students' English writing. It is to verify that there is a strong temporal correlation
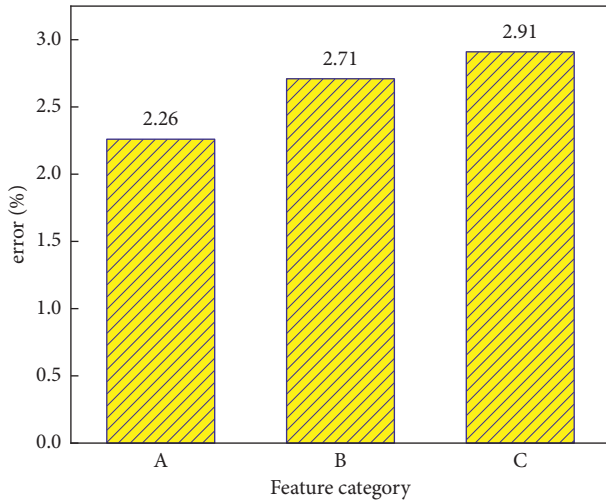
Figure 3: Prediction errors of three characteristics of college students' English writing using CNN and LSTM.



Figure 4: Prediction with and without LSTM algorithm improves accuracy in the English writing evaluation system.

in the characteristics of English writing. It also illustrates the importance of the LSTM method for an intelligent review system for English writing. The average error will reflect the adaptability and feasibility of the model. Figure 3 shows the predicted mean errors of three college English writing features using CNN and LSTM algorithms. In general, CNN and LSTM algorithms have high feasibility and accuracy in predicting grammar, sentence patterns, and emotional expressions in English writing. All prediction errors were within 3%, and all prediction errors were within the margin of error for English writing assessments. The smallest error is only 2.26%, which is a very small error for the judgment of college students' English writing, and this part of the error has high credibility for both students and teachers. This part of the error comes from the prediction of the grammatical features of college students' English writing. The largest prediction error is only 2.91%. Only this part of the error is relatively large, but this part of the error is also within the range of 5%. This part of the error comes from the prediction of the emotional expression characteristics of English writing, and this part of the characteristics has more volatility for different students' writing characteristics.

The LSTM algorithm in the English writing intelligent evaluation system mainly extracts the temporal features of the sentence patterns and emotional expression features of English writing. This study also analyzes the difference in the accuracy of the English writing intelligent evaluation system with and without the LSTM algorithm. Figure 4 shows a comparison of the improved accuracy of the two neural networks in extracting English sentence patterns and emotional expression features. In general, the neural network algorithm with LSTM structure will improve the prediction accuracy of the English writing intelligent evaluation system. This shows that the sentence patterns and emotional expression features in English writing contain rich temporal features. When applying the intelligent evaluation system for college students' English writing, it is necessary to fully consider the time characteristics of English
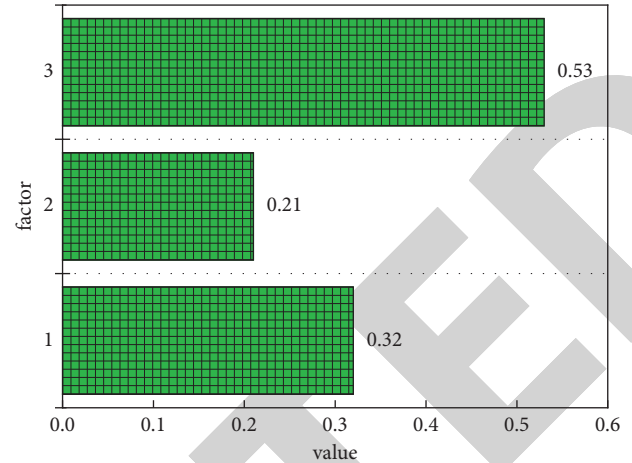
writing, which will improve the accuracy of prediction. It can be seen from Figure 4 that the most improved prediction accuracy is the emotional expression feature, and its percentage of improvement is 0.53%. This means that the CNN-LSTM algorithm improves the emotional expression feature of English writing by 0.53% compared to the single CNN method for predicting accuracy. For the intelligent evaluation system of English writing, the prediction error of English emotional characteristics is only 1.63%. The prediction error value for English grammatical features is also only 2.50%. This is an extremely high precision for the English writing intelligent evaluation system. For the three prediction features of English writing, the English grammar feature has the lowest improvement in accuracy, and the prediction accuracy in this area is improved by 0.21%. Although this is a part of the lower percentage of improvement, this is a significant improvement for the English writing intelligent judgment system. Precision is also a crucial part. This also shows that English grammar also contains more temporal features.

It can be seen from Figure 4 that the CNN-LSTM method has higher accuracy in predicting English writing features. In this study, the CNN-LSTM method was used to predict three important characteristics of English writing separately. Figure 5 shows the distribution of predicted and actual values of English grammatical features of English writing. In general, the predicted values of the 15 groups of English grammar feature values selected in this study are in good agreement with the actual values. Although the eigenvalues of these 15 groups of English grammar have large fluctuations, and there are also many peaks and troughs, the CNN-LSTM method can better predict the eigenvalues of English grammar. The predicted values of most English grammar eigenvalues have small differences with the actual values, and only some eigenvalues have large differences between the predicted values and the actual values, but this part of the difference is also within the acceptable error range.

Figure 6 shows the prediction error distribution of sentence pattern features of college students' English
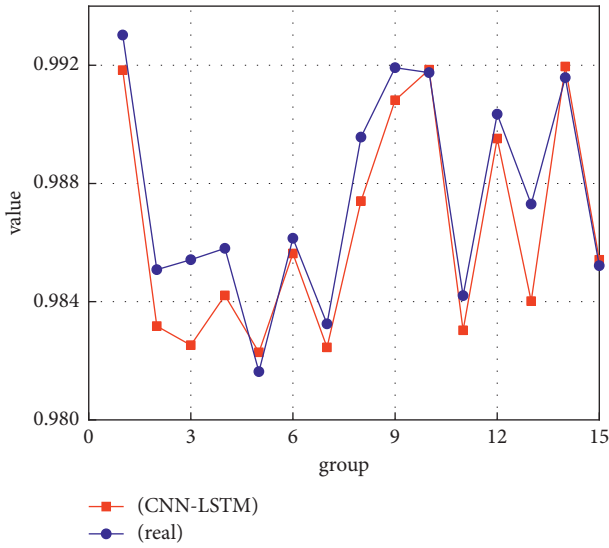
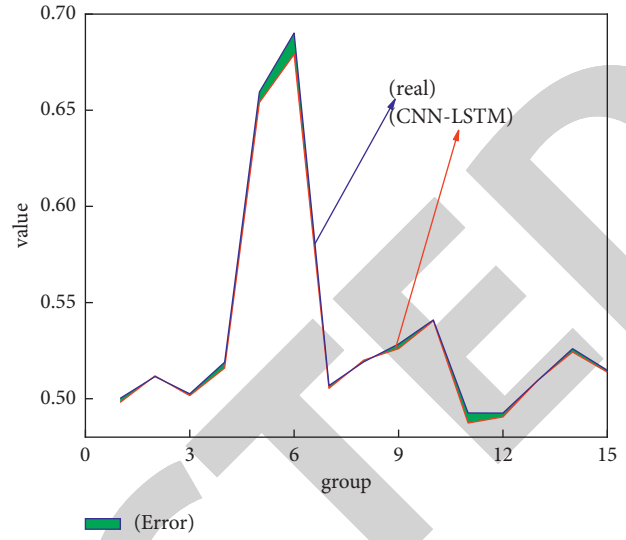Figure 5: Distribution of predicted and actual values of English writing in English writing.



Figure 6: Error distribution between predicted and actual values of English sentence pattern features.



Figure 7: The distribution of predicted value, actual value, and error of emotional expression characteristics in English writing.

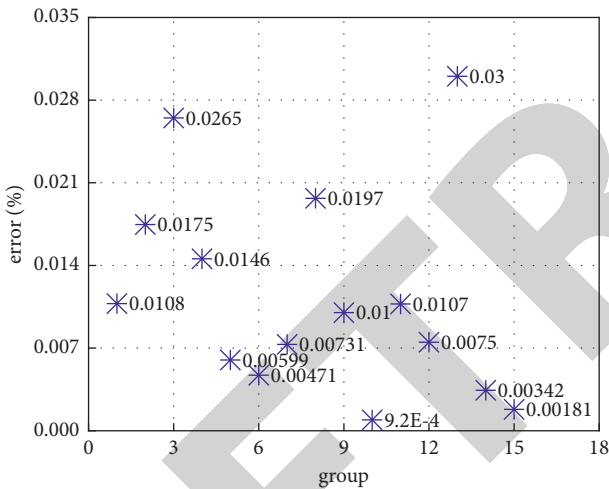writing. Although the sentence pattern features have large volatility, the accuracy of the CNN-LSTM algorithm has been greatly improved compared to the CNN algorithm. Overall, the CNN-LSTM algorithm has high reliability in predicting the sentence pattern features of college students' English writing. This study also selected 15 groups of sentence pattern features of college students' English writing to analyze the accuracy of the CNN-LSTM algorithm. Most of the prediction errors are distributed within 2%, which shows that the CNN-LSTM algorithm can meet the requirements of college students' English writing intelligent evaluation system. Only a small number of prediction errors exceed 2%. Among these 15 groups of sentence pattern features in English writing, the largest prediction error is only 3%. Most of the errors are also distributed within 1%. From these errors, it can be seen that the CNN-LSTM algorithm can

accurately extract the sentence pattern features of English writing.

Of the three characteristics of college students' English writing, the most difficult to predict is the emotional expression in English. Emotional expression in English is also an important feature of English writing. The feature of English emotional expression should also be fully considered in the intelligent English writing evaluation system. Figure 7 shows the predicted value and error distribution of the emotional expression features of English writing. In general, the predicted value of the emotional expression is in good agreement with the actual value, whether it is the magnitude of the value or the change trend of the value. Although there are relatively large differences in the characteristics of emotional expression among the 15 different groups of English writing, there are also relatively large gradient changes. However, the CNN-LSTM model is very good at predicting the gradient change of this feature. The green area is the error between the predicted value of the emotional expression and the actual value, and the area of the green area is relatively small. There is a large green area only at the peaks. This shows that the CNN-LSTM algorithm has better prediction performance in most emotional expression features.

## 5. Conclusions

With the increasing number of international exchanges, the study of English is a vital part. College students are an important part of national construction, and college students' English learning is also more critical. Writing is a part of English learning, which mainly reflects the grammar, sentence patterns, and emotional expression of English learning. Teachers' evaluation of college students' writing is highly subjective, and this manual evaluation method also has the defects of poor timeliness and high error rate. This research uses AI technology to design an intelligent college

English evaluation system, which has the advantages of good timeliness and low error rate. It also has a certain objectivity.

This study compares and analyzes the influence of the LSTM neural network on the feature extraction of college students' English writing. The prediction accuracy of the algorithm containing LSTM can be improved by 0.53% compared with the CNN algorithm, and the minimum improvement accuracy is also 0.23%, which contains large temporal features. CNN-LSTM has high accuracy and feasibility in predicting the grammar, sentence pattern, and emotional features of college students' English writing. All prediction errors are within 3%, which meets the requirements of the intelligent evaluation system for college students' English writing. The largest prediction error is only 2.91%, and this part of the error comes from the prediction of the emotional expression characteristics of English writing. Among these three characteristics, emotional expression is one of the most difficult to predict in English writing. However, the CNN-LSTM method can still predict the features of emotional expression more accurately. The smallest prediction error is 2.26%, which comes from the prediction of the grammatical features of English writing. In general, the artificial intelligence method has good feasibility and accuracy in the intelligent evaluation system of college students' English writing.

## 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.

## Acknowledgments

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