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Original scientific paper

A Generative Adversarial Networks Based Approach for Literary Translation

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Abstract: This study aims to solve the problem of mistranslation due to the fact that literary intelligent translation only stays at the stage of text description and elaboration and lacks relevant facts. Therefore, this paper puts forward an improvement method of literary intelligent translation text based on generation confrontation network. First, an adaptive literary intelligent translation mode is designed under the generation confrontation network, and then the data of literary intelligent translation text improvement is preprocessed, and the data mining of text improvement quality evaluation is carried out. According to the mining results, a literary intelligent translation text improvement quality evaluation model is constructed to evaluate the quality of literary intelligent translation text improvement. According to the quality results, this paper constructs the improvement model of literary intelligent translation text, designs the improvement process, and completes the research on the improvement method of literary intelligent translation text that generates confrontation network. The experimental results show that this method has better detection effect of mistranslation features, better stability of the improved method, accurate and reliable results, and can improve the literary literacy of students and teachers.

Keywords: data mining; generate confrontation network; intelligent translation of literature; literary literacy; text improvement methods

1 INTRODUCTION

Vocabulary and sentences are the basis of intelligent literary translation of text materials. Therefore, in text translation, the translation of vocabulary and sentences is the primary problem that translators need to solve in order to achieve the most basic credibility in the translation process. In recent years, a large number of experts and scholars have studied literary intelligent translation from different perspectives [1]. It covers the classification and induction of mistranslation in literary intelligent translation; Context analysis in sentence translation; Identification of dynamic meaning of vocabulary, etc. [2]. Because the time of text translation is relatively concentrated, the translation work is difficult, and mistranslation often occurs, which affects the credibility of the translated text. Therefore, the improvement of literary intelligent translation text is of great significance.

Compared with other approaches of translation theory research, with the development of computer and linguistics, people have paid less attention to linguistic translation in recent years, ignoring the application value of this theory, and literary intelligent translation has been paid attention to. Text vocabulary is one of the important elements of sentences and texts. It plays an important role in clearly expressing the content of sentences and improving the expression ability of sentences [3]. How to improve the accuracy of Vocabulary Translation in the process of intelligent literary translation text improvement is a problem that cannot be underestimated [4]. If linguistic translation theory can be applied to literary intelligent translation proofreading, it may reduce the frequency of mistranslation in literary intelligent translation and improve the reliability of translation results. In the field of natural language processing, the improvement method of literary intelligent translation text generation against network has gradually become one of the main research directions. In the process of the continuous development of generative confrontation network, more and more scholars have begun to study the application of generative confrontation network to achieve the improvement of literary intelligent translation text, so as to avoid the problems of low efficiency and poor accuracy of previous grammar improvement [5]. There is a great gap between the two language systems involved in literary intelligent translation in terms of expression and grammar, and it is impossible to achieve literary intelligent translation completely through literal translation. Usually, literary intelligent translation mostly adopts free translation and literal translation. Due to the differences in the structure of the two language systems and the cultural factors involved, free translation has certain constraints and is prone to mistranslation. In addition, improper word selection and insufficient professional knowledge are also easy to lead to grammatical mistranslation, which reduces the accuracy of literary intelligent translation and brings inconvenience to practical application. In order to effectively solve the above problems, we need to choose appropriate methods to improve the grammatical mistranslation of literary intelligent translation accurately and efficiently, and improve the accuracy of literary intelligent translation [6]. Therefore, this study proposes an improvement method of literary intelligent translation text based on the generation of confrontation network, which can improve the translation level while learning the previous translation theories, correct the mistranslation in translation in time, and realize the improvement of literary intelligent translation text. Its advantages are strong adaptability and high autonomy. Its detection results can be updated autonomously with the change of sample distribution mode, and the overall detection performance is high. Realize the improvement of grammatical mistranslation in literary intelligent translation, effectively and accurately improve all kinds of mistranslation problems in literary intelligent translation grammar, improve the accuracy of translation, and provide convenience for people.

2 LITERATURE REVIEW

Zhu X. et al. [7] translated the transcoding text into two languages, proposed an adversarial dual channel encoder architecture, in which two dedicated encoders took the parallel text of two languages as input respectively. Private coder and shared coder work together to effectively retrieve features from both monolingual and bilingual perspectives under confrontation training. On the data of

Chinese English, Spanish, English and Hindi English mixed codes, F1 scores exceed 1.5%, and the system translation effect is good.

Liu J. [8] studied that Mark Bender translated the important epic Hnewo Teyy of the Nuosu nationality directly and completely from Yi language into English for the first time. Their translation and introduction of this epic involves the Nusu Origin Book, in which Bende involves plants and animals. This paper mainly analyzes Bender's adaptation and selection of animal and plant investigation and translation under the guidance of ecological translatology. Ecological translatology and Bende's translation and introduction provide enlightenment for the spread of Chinese culture.

Chai J. [9] designed an AI translation system based on support vector machine to improve the level of intelligent English translation software and the accuracy of English. Use the search module to retrieve the basic meaning and subject content of words, and proofread to master user behavior. In the software system, the computer intelligent proofreading method based on SVM is used to find the correct word to replace the word to be proofread, so as to realize the intelligent proofreading of English translation.

Liu W. et al. [10] proposed a new neural network Structformer based on transformer, which takes the order of the current object arrangement and the structured language command encoding the required object configuration as the input. The robot can rearrange the semantic structure by using the multi object relationship constraints inferred from language commands.

3 RESEARCH METHOD

The overall framework of literary intelligent translation text improvement under generative adversarial network is shown in Fig. 1.

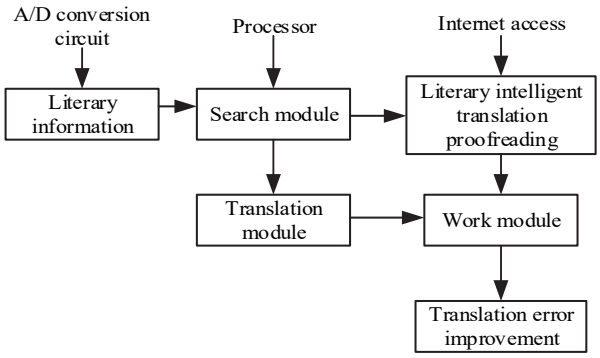

Figure 1 General framework for improving literary intelligent translation texts

In Fig. 1, the processor, A/D conversion circuit, search module and work module constitute the main part of the overall framework of literary intelligent translation text improvement. The behavior data generated in the process of literary intelligent translation text improvement is recorded through logs. The setting of behavior logs provides a scientific basis for real-time literary translation error improvement [11-12]. When the search module receives the conversion demand, it immediately puts the system into working state, launches vocabulary processing and feature search, implements basic meaning acquisition and subject content search for the vocabulary to be checked, ensures that the close answers are within the search range, and improves the efficiency of literary intelligent translation text improvement.

3.1 Design an Adaptive Intelligent Translation Model of Literature

In order to connect the macro and micro dimensions, this paper studies the literary intelligent translation skills under the generative confrontation network, and designs a translator centered adaptive literary intelligent translation model.

Translators run through the whole process of literary intelligent translation and are the main body of translation activities. Since literary intelligent translation includes many links, such as material selection, word and sentence processing, it requires the participation and leadership of translators [13, 14]. Even if it is the same paragraph, the translator can choose different translation skills according to the translation purpose, and the output translation results will be quite different. In addition, translators' concept of literary intelligent translation directly affects the choice of translation methods. Among them, the style orientation of the translation audience will also restrict the translator's choice of translation strategies [15]. The self-adaptive intelligent translation mode of literature under the generation of confrontation network with efficient translators as the core is shown in Fig. 2.

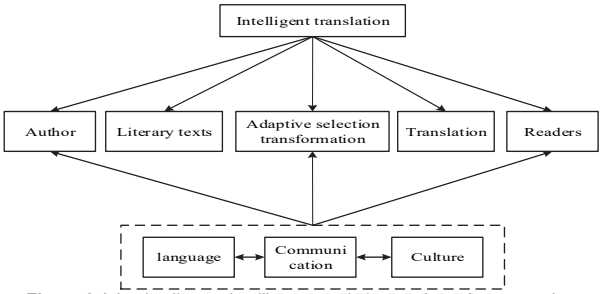

Figure 2 Adaptive literary intelligent translation mode under generation confrontation network

According to Fig. 2, the core of intelligent translation of literature in colleges and universities lies in the exchange of ideas, and adaptive selection and transformation is the key link. Integrating the theory of ecological translation into the research of literary intelligent translation skills, this paper puts forward literary intelligent translation skills that meet the transformation of adaptive selection from the perspectives of language, culture and communication.

Among them, language structure is transformed at the language level such as language structure and word usage habits, that is, the adaptive selection transformation of language dimension. After the intelligent translators of literature in colleges and universities have enough understanding of the expression habits of the original author, they can choose the appropriate language form to ensure that the intelligent translation of literature conforms to the original language ecological environment [16, 17]. It should be noted that literary intelligent translation should avoid word for word and sentence by sentence translation, and no longer simply pursue the neat language form, but combine the ecosystem of the target language and the

original language to strengthen the ecological balance between the original text and the translation in the intelligent translation of literature in colleges and universities, so as to provide a better translation environment for translators.

The adaptive selection and transformation of cultural perspective is one of the important means of literary intelligent translation, and it is also the key to improving the quality of literary intelligent translation. Due to the great differences between English and Chinese expressions, in order to avoid misleading language in the results of intelligent literary translation, the cultural ecosystem of the original text needs to be applied in the translation process. Under the condition of ecological balance between the two languages, the cultural and emotional content contained in the original text is displayed to achieve the purpose of smooth communication [18]. In addition, before the intelligent translation of literature proposed in this paper begins, the translator needs to deeply understand the cultural value of the original language, effectively transform the cultural connotation, and get the best translation content.

The main purpose of the text improvement technique of literary intelligent translation is to successfully realize the communicative intention. When the communicative intention in the original text is ignored, the content of literary intelligent translation has no effect. Therefore, it is proposed that translators should focus on the cultural connotation contained in language information and use appropriate adaptive transformation methods to express it to achieve the purpose of communication [19, 20]. In short, literary intelligent translation should not translate literally, but extract the deep connotation of the original text and output the best translation content.

To sum up, after the generative adversarial network integrates the theory of ecological translation, it proposes the intelligent translation skills of literature. The main selection conversion of literary intelligent translation is completed through "three-dimensional conversion", and the remaining secondary selection conversions need to be based on the actual translation content. It is up to the translator to choose the dimension of language conversion for attention, to enhance the adaptability of the translated text, and ultimately to improve the quality of intelligent literary translation.

3.2 Evaluation on the Quality of Literary Intelligent Translation Text Improvement

3.2.1 Improved Data Pre-processing for Intelligent Literary Translation

Get high-quality translated text through the designed adaptive literary intelligent translation mode, the improved data of literary intelligent translation is denoised by mining data through probabilistic undirected graph model. The specific process is as follows:

Step 1: For the mined literature intelligent translation text improvement quality evaluation data, use P to represent, Q to represent the effective event flow, and initialize P, as shown in the following formula:

$$P=Q\times J_{\mathrm{U}} \tag{1}$$

In Eq. (1), J_{U} represents the original data of text improvement quality evaluation information of intelligent translation.

Step 2: divide the original data into multiple event 3D flow blocks according to the number of texts, represented by the following formula:

$$J_{\mathrm{U}}=\left\{J_{\mathrm{U}1},J_{\mathrm{U}2},\cdots,J_{\mathrm{U}n}\right\} \tag{2}$$

In Eq. (2), $J_{\mathrm{U}n}$ represents the 3D flow block of the n-th event.

Step 3: Traverse all three-dimensional flow blocks of events; Initialize the processing event status value.

Step 4: Take $R(Q, P)$ as the initial value of parameter R_{BEST}, and R_{BEST} is the best energy value; Set the maximum number of iterations, represented by $l_{\max}$; Cycle through the iteration number l to increase $l_{\max}$ from 1 to $l_{\max}$; For a single iteration, loop through all events in the three-dimensional flow block of the current event;

For the currently traversed event, change its state value, as shown in the following formula:

$$q_m=R\left(Q_i,P\right)\times R_{\mathrm{BEST}}\times l_{\max} \tag{3}$$

Step 5: Keep the state values of other events unchanged, and calculate the corresponding energy values in the new state through Eq. (4):

$$R_{\mathrm{new}}=R\left(Q_i,P\right)\times q_m \tag{4}$$

Step 6: Judge whether the following formula is true:

$$R_{\mathrm{new}}<R_{\mathrm{BEST}} \tag{5}$$

When Eq. (5) is established, it indicates that the energy value obtained by the event of literary intelligent translation text improvement quality evaluation in the new state is low, that is, the event is a noise event, which is marked and updated, as shown in the following equation:

$$R_{\mathrm{BEST}}=R_{\mathrm{new}} \tag{6}$$

When Eq. (5) does not hold, it indicates that the current event of literary intelligent translation text improvement quality evaluation is an effective event, and the current event state can be changed, as shown in the following formula:

$$R_{\mathrm{BEST}}{}'=R_{\mathrm{new}}{}' \tag{7}$$

Step 7: Delete all marked events in the three-dimensional flow block of the current event, and return to step 4 until the denoised effective literary intelligent translation text improvement quality evaluation event flow is obtained.

3.2.2 Text Improvement Quality Evaluation Data Mining

Design an improved mining algorithm of generation confrontation network, and implement data mining of

literature intelligent translation text improvement evaluation. The specific steps of data mining for text improvement quality evaluation under the generation confrontation network are as follows:

Step 1: Calculate the corresponding local density value of each data point in the text improvement quality evaluation dynamic data set. When calculating the local density value, only the influence of all data objects in the radius field on the actual density calculation result is considered, and the influence of surrounding local data objects and data objects outside the radius field on the calculation result is not considered [21];

Step 2: For the maximum local density value, the corresponding teaching quality evaluation data point is the density core point;

Step 3: According to the actual calculation results of density core points and dynamic neighborhood radius, obtain the first density data cluster, which is represented by W_{E}. The calculation formula of dynamic neighborhood radius is as follows:

$$W_{\mathrm{E}} = W_{12} \times \frac{R_a}{R_b} \tag{8}$$

In Eq. (8), W_{12} represents the corresponding reachable distance of the initial density, R_a represents the corresponding density value of the first determined cluster density core, and R_b represents the corresponding density value of the later determined cluster density core.

The calculation formula of the corresponding reachable distance W_{12} of the initial density is as follows:

$$W_{12} = D_{\mathrm{QW}} \times X_{\mathrm{CV}} \times G_{\mathrm{H}} \times W_{\mathrm{E}} \tag{9}$$

In Eq. (9), D_{QW} represents the distance adjustment coefficient; X_{CV} refers to the set of data objects; G_{H} represents the average distance of the data object set.

Step 4: In addition to the maximum density core point, calculate the local density of the data point, and search for other density core points in turn. And based on the dynamic neighborhood radius, the density data clusters corresponding to the second, third, ... are obtained in turn, which are represented by W_{E2}, W_{E3}, ... Finally, all the density data clusters of the original literature intelligent translation text improvement quality evaluation large data set are obtained, as shown in Fig. 3.

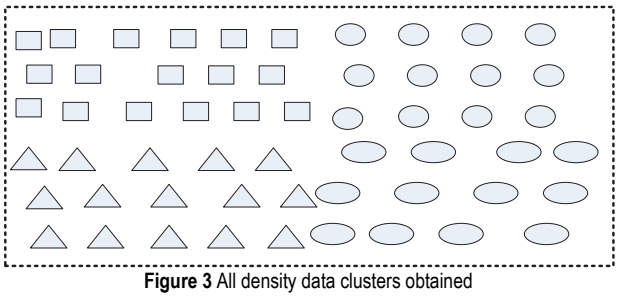

Figure 3 All density data clusters obtained

Step 5: Re-partition the obtained density data cluster, realize its dynamic incremental clustering, and complete data mining for text improvement quality evaluation.

3.3 Construct the Evaluation Model of Literary Intelligent Translation Text Improvement Quality

Build an improved quality evaluation model of literary intelligent translation text based on the generative confrontation network. Specifically, search improves the multi-layer perceptron in the generative confrontation network, realizes the improved generative confrontation network through the architecture of the Internet of things, the text improvement quality evaluation model of literary intelligent translation is constructed by using the mined text improvement quality evaluation data. In the improvement of the multilayer perceptron, the classical mode is first introduced into the gradient method to enable the algorithm to iterate continuously along the direction of negative gradient [22, 23]. Then construct the classical pattern search direction, search along this direction, continue to cycle until the minimum point is found. Finally, the search calculates the learning rate in this direction, and the specific formula is as follows:

$$K_{\mathrm{OP}} = \frac{S_\alpha - S_\beta}{\alpha \times \beta \times M_V} \times W_{12} \tag{10}$$

In Eq. (10), S_α represents the objective function of the α-th negative gradient; S_β represents the objective function of the β negative gradient; α represents the negative gradient threshold; β represents the gradient coefficient at the iteration point; M_V represents the corresponding search direction of the V iteration. Through this improvement, the multi-layer perceptron can have a faster convergence speed, and achieve the minimum error mean square value between the expected output value and the actual output value of the network [24].

In the improved multi-layer perceptron, five improved quality evaluation indexes of literary intelligent translation text are used as network input, and the quality evaluation results are used as network output. The five evaluation indicators of the quality of literary intelligent translation text improvement are the effect of translation text improvement, the ability of translation text improvement, the strategy of translation text improvement, the content of translation text improvement and the attitude of translation text improvement [25]. Using the generated countermeasure network as the transfer function of the improved multi-layer perceptron, the corresponding unit characteristics of the output node are determined as linear, and the coefficient learning law is obtained through the back-propagation algorithm.

The input layer of the improved multilayer perceptron is represented by Eq. (11):

$$O = \{O_1, O_2, O_3, O_4, O_5\} \tag{11}$$

In Eq. (11), O_1, O_2, O_3, O_4 and O_5 refer to the five evaluation indicators for the improvement quality of literary intelligent translation text respectively.

Each network hidden layer is represented by Eq. (12):

$$Z_{XX} = \sum L_{ab} \times K \times O \tag{12}$$

In Eq. (12), L_{ab} represents the hidden layer weighting coefficient, and K represents the independent variable of transfer function.

The output layer of the improved multilayer perceptron is represented by Eq. (13):

$$\hat{Y} = \sum \lambda \times U_u \times Z_{XX} \tag{13}$$

In Eq. (13), λ represents the output weight coefficient and U_u represents the transfer function.

The improved multi-layer perceptron is realized through the Internet of things architecture. The designed Internet of things architecture is composed of three layers. The first layer is the application layer, which is composed of deep learning simulation framework and application infrastructure such as web services, cloud computing and parsing services [26]; The second layer structure is composed of Internet of things gateway and Internet; The third layer structure is composed of information transmission module and data acquisition module, in which the information transmission module is composed of sensor middleware technology and short-distance transmission technology, and the data acquisition module is composed of intelligent devices and sensors. Through this framework, the algorithm is implemented, and the quality evaluation model of literary intelligent translation text improvement is built.

Based on the generated confrontation network, the operation steps of the improved quality evaluation model of literary intelligent translation text are as follows:

Step 1: Input training samples;

Step 2: Calculate the average gradient of the sample;

Step 3: Revise the iteration step size;

Step 4: Update the parameters and complete the training;

Step 5: Through the trained model, the improved quality evaluation of literary intelligent translation text is implemented, and the obtained network output is taken as the evaluation result, so as to complete the construction of the improved quality evaluation model of literary intelligent translation text.

3.4 Building a Text Improvement Model for Literary Intelligent Translation

Based on the evaluation model of literary intelligent translation text improvement quality, a literary intelligent translation text improvement model is constructed. Let the improved feature set of literary intelligent translation text generated by the confrontation network be $\{C_1, C_2, ..., C_N\}$, divide it into several subsets $\{C'_1, C'_2, ..., C'_N\}$, and take this as the input to build an improved model of literary intelligent translation text, so as to realize the improvement of literary intelligent translation text. The specific construction process of the improved model is as follows:

Step 1: input the grammar mistranslation feature subset $\{C'_1, C'_2, ..., C'_N\}$, parameter perturbation B, and the grammar text training sample subset $\{G'_1, G'_2, ..., G'_M\}$ of literary intelligent translation;

Step 2: Based on the grammar feature subset C'_i, project the grammar text training sample subset G'_j of literature intelligent translation, and obtain the sample $G_{i,j}$ corresponding to the grammar mistranslation feature subset;

Step 3: Analyze $G_{i,j}$, calculate the low deviation region of the sample, and select the penalty parameter D of disturbance B and the parameter of reducing classifier deviation;

Step 4: The h penalty parameter and the reduced deviation parameter are represented by D_h and γ_h means that these two parameters are used to generate the improved sub model and add it to the improved model set;

Step 5: Make the corresponding literary intelligent translation grammar text training sample $G\left(e_{i\times j\times h}\right) = G_{i,j}$, and add this training sample to the literary intelligent translation grammar text training sample set G_{all};

Step 6: Output the improved model set and the corresponding grammar text training sample set of literary intelligent translation. Finally, the constructed improved model contains several different improved sub models, and the constructed improved model of literary intelligent translation text is shown in Fig. 4.

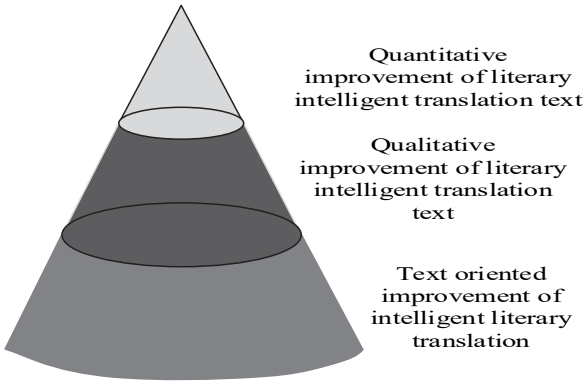

Figure 4 Structure diagram of text improvement model for intelligent literary translation

According to the literature intelligent translation text improvement model shown in Fig. 4, the main elements are the directional factors, qualitative factors and quantitative factors of literature intelligent translation text improvement, covering multiple subjective intentions. The dominant element is the translator, designing translator centered intelligent translation strategies and intelligent translation purposes. These three factors show the characteristics of interaction and infiltration in the process of forming the improved model of literary intelligent translation text, so as to complete the construction of the improved model of literary intelligent translation text.

3.5 Improve Process Design

The text improvement of literary intelligent translation is realized based on the constructed improved model. Because each sub model in the model set is generated based on different feature subsets, it is necessary to implement projection when inputting grammatical text data of literary intelligent translation into the text improvement model set;

After all the improved sub models output the improved results, the final improved results are obtained by voting based on the simple majority principle. The specific improvement process is as follows:

Step 1: Input the improved feature subset corresponding to each improved sub model;

Step 2: Let t represent the iteration time, then the grammar text data of literary intelligent translation obtained in the last iteration is represented as S;

Step 3: Each improved sub model $e_i \in E_{\text{all}}$ projects vectors based on the improved feature subset C_i' corresponding to the improved sub model, and inputs them into the improved sub model to implement improvement;

Step 4: Improve the VTT-1 vector in turn through all sub models in the improved model set E_{all}, and vote after counting all the improved results;

Step 5: Output the final improvement mark of the whole. When the mark is equal to −1, it means that there is a mistranslation of this grammar; when the mark is equal to 1, it means that the grammar is correct, so the research on the improvement method of literary intelligent translation text based on the generation confrontation network is completed.

4 RESULTS AND DISCUSSION

4.1 Experimental results

In order to verify the effect and feasibility of the improved method of literary intelligent translation text based on generative confrontation network, taking the corpus of a literary intelligent translation platform as an example, part of the corpus is randomly selected as the experimental object, and the selected experimental corpus contains a total of 10 grammatical mistranslation categories, including verb errors, abbreviation errors, rhetorical errors, voice errors, word order, vocabulary errors, missing words, subject predicate errors and multiple words. Through this method, the grammatical mistranslation in some experimental corpus is corrected to test the practical improvement and application effect of this method.

The experiment mined the relevant teaching quality evaluation data of English translation classes in two colleges and universities through the generation of confrontation network, and took it as the experimental data set. The specific information of the data set is shown in Tab. 1.

Table 1 Information of experimental data set

Project	Data set
Data volume	60 GB
Number of data pieces	25000
Course type	Traditional classroom + online learning
Teaching environment	Real learning environment + virtual learning environment
Data span	Three years
Mistranslation category	10 categories

The data set also contains teaching quality evaluation data, including pre class data, in class data, after class data and activity data of teachers, environment and students. The experimental corpus is randomly divided into five data sets, namely *A*, *B*, *C*, *D* and *E*. the basic information of each data set is as follows:

(1) The total sample number of dataset *A* is 200, and the sample number of grammatical mistranslation is 20. The grammatical mistranslation categories included are abbreviation error, multi word, voice error, verb error, missing words, subject predicate error and vocabulary error;

(2) The total number of samples in the *B* data set is 400, and the number of grammatical mistranslation samples is 40. The mistranslation categories include subject predicate errors, verb errors, word order, missing words, and voice errors;

(3) The total sample number of *C* dataset is 600, and the sample number of grammatical mistranslation is 60, including mistranslation categories of missing words, multiple words, word order, lexical errors, singular and plural errors of nouns, subject predicate errors, verb errors and abbreviation errors;

(4) The total sample number of *D* data set is 800, and the sample number of grammatical mistranslation is 80. The mistranslation categories include verb errors, abbreviation errors, rhetorical errors, voice errors, word order, vocabulary errors, missing words and multiple words;

(5) The total sample number of *E* data set is 1000, and the sample number of grammatical mistranslation is 100. The mistranslation categories include subject predicate errors, verb errors, abbreviation errors, rhetorical errors, voice errors, missing words, multiple words, word order, vocabulary errors, and singular and plural noun errors.

Table 2 Detection results of mistranslation characteristics of this method

Characteristic sample set number	Number of initial clusters / piece	Number of final clusters / piece	Number of mistranslation features / piece
*A*1	19	20	1
*B*1	38	41	3
*C*1	57	59	2
*D*1	79	80	1
*E*1	98	101	3

First, the experimental data sets are preprocessed by this method, and the grammatical features are extracted. Then the mistranslation features in the extracted grammatical features are detected, and the mistranslation feature detection results of this method are presented to test the mistranslation feature detection effect of this method. During the detection process, set the initial clustering parameter k value of the five grammatical feature sample

sets ($A1$, $B1$, $C1$, $D1$, $E1$) extracted from the five experimental data sets, repeat the experiment on each feature sample set in turn through this method, and take the average value as the mistranslation feature detection result, as shown in Tab. 2.

By analyzing Tab. 2, it can be concluded that this method can detect grammatical mistranslation features. The number of grammatical mistranslation features detected in each grammatical feature sample set is very close to the number of mistranslation categories in the corresponding data set. It can be seen that the mistranslation feature detection effect of this method is good. Test the effect of the improvement of literary intelligent translation text based on the generated confrontation network, and the results are shown in Tab. 3.

Table 3 Semantic coverage evaluation results

Featured vocabulary collection	Number of correct relationships	Total quantity generated	Improve accuracy
A1	20	200	93.4%
B1	40	400	95.6%
C1	60	600	96.2%
D1	80	800	97.2%
E1	100	1000	98.6%

According to the analysis of Tab. 3, the stability of literary intelligent translation text improvement using this method is good, and the improvement results are accurate and reliable. Spss22.0 software is used to analyze the comparative results of students' literacy before and after the improvement of intelligent translation text of literary works, as shown in Tab. 4.

Table 4 Evaluation results of students' literacy before and after the improvement of intelligent translation text of literary works

Entry name	Before improvement		After improvement		Difference	
	Average value	Standard deviation	Average value	Standard deviation	Average value	Standard deviation
English literacy	1.97	0.73	3.22	0.92	1.25	0.19
Literary accomplishment	2.09	0.71	3.24	0.93	1.15	0.22
Reading literacy	1.20	0.53	1.64	0.63	0.44	0.1
Online word volume	1.83	0.23	2.31	0.62	0.48	0.39
Literacy characteristics	1.81	0.46	2.52	2.43	0.71	1.97
Total	8.9	2.66	12.93	5.53	4.03	2.87

According to the test results in Tab. 4, there are significant differences in students' literacy before and after the improvement of intelligent translation of literary works. The average value of the literacy score before the improvement is 8.9, the standard deviation is 2.66, the literacy score after the improvement is 12.93, the standard deviation is 5.53, and the scoring rate after the improvement is increased by 4.03 and 2.87 respectively. Therefore, it can be seen that after the improvement of literature, students' literary literacy has been significantly improved.

The teacher's literacy before and after the improvement of intelligent translation text of literary works is evaluated from five aspects: English literacy, literary literacy, reading literacy, online vocabulary and literacy characteristics. The results are shown in Tab. 5.

Table 5 Evaluation results of teachers' literacy before and after the improvement of intelligent translation texts of literary works

Entry name	Before improvement		After improvement		Difference	
	Average value	Standard deviation	Average value	Standard deviation	Average value	Standard deviation
English literacy	2.19	0.95	3.44	1.14	1.25	0.19
Literary accomplishment	2.31	0.93	3.46	1.15	1.15	0.22
Reading literacy	1.42	0.75	1.86	0.85	0.44	0.1
Online word volume	2.05	0.45	2.53	0.75	0.48	0.3
Literacy characteristics	2.03	0.68	2.74	2.64	0.71	1.96
Total	10	3.76	14.03	6.53	4.03	2.77

Tab. 5 shows that there are also significant differences in Teachers' literacy before and after the improvement of intelligent translation texts of literary works. Teachers believe that the difference between distance teaching and general classroom teaching in the training mode is the smallest, and the difference between the two is mainly reflected in the vocabulary and testing standards. Teachers have many years of education and teaching experience, have strong classroom mastery ability, are familiar with literary works, and have a mature teaching mode. They feel that there is no essential difference in teaching methods between distance teaching and traditional classroom teaching. In addition, they can basically meet the requirements of maintaining a rigorous teaching style in their reading attitude. To some extent, teachers can better integrate into students and make students interested in literary works, so as to strengthen students' reading literacy and English literacy.

4.2 Discussion and Analysis

In view of the current situation and problems of the development of literary intelligent translation text, this paper applies generative confrontation network in this study, and puts forward the improvement methods of literary intelligent translation text, in order to improve the current problems of literary intelligent translation and promote the development of translation industry.

4.2.1 Literary Micro Vocabulary Translation Inspection

The problem of missing translation of functional words is partly due to the subjective translation problems caused by different translators' personal translation habits, and partly due to the neglect of the role of such words in context connection in the process of proofreading. In order to solve this problem, we need to check it according to Linguistics in the process of checking.

The meaning and function of each word in the translation is not insignificant. In many cases, an article will change the meaning of the sentence. Therefore, in the process of improving the translated text, we need to effectively avoid the lack of small vocabulary. According to linguistic translation theory, the meaning of sentences is defined. If there is a lack, it is compared and judged with reference to the original text. Similarly, in case of lexical repetition, it is also necessary to compare the original text to determine whether to eliminate this part of the words.

Unlike English, Chinese pays more attention to the meaning of sentences in text writing, and there is no mandatory requirement for the use of vocabulary. Therefore, lexical ellipsis often occurs in the process of text improvement in literary intelligent translation. In the process of alignment, some words can be added according to sentence structure to make up for the meaning of sentence expression. According to the context, the translation can be smoother and conform to the written form of Chinese expression. In the translation and proofreading of small vocabulary, it is not necessary to check word by word and sentence by sentence, but to increase or decrease small vocabulary reasonably to complete this process. In the process of improving the translated text, more reference should be made to the semantic database to avoid mistranslation due to incomplete semantic understanding. In the mistranslation feature detection results of the proposed method, the number of mistranslation features is between 1 and 3, which shows that the proposed method has good mistranslation feature detection effect and can realize the translation check function of literary micro vocabulary.

4.2.2 Add Functional Proofreading Module of Professional Terms

Under the theory of literary intelligent translation, some unusual translation methods such as rewriting and modifying can be adopted for some special words. In order to achieve the expected translation effect, most translators use the principle of vocabulary centered and audience oriented to complete the translation process. Therefore, a functional proofreading module is added in the process of literary intelligent translation to translate and proofread this part of nouns.

According to semantics and Lexicography in linguistics, "transliteration combination method" and "adjustment method" are used to deal with professional nouns in the process of intelligent literary translation. However, if you pay too much attention to beauty, you may ignore the core content of this term, which is prone to mistranslation. Therefore, when checking its quasi nouns, it is necessary to sort out the translation results according to the meaning of nouns and the pronunciation of nouns, combined with the efficacy of products, so as to bring people beautiful reverie. At the same time, the translation results should be adjusted in time, and the most effective information in the translation results should be selected as the final translation results. At the same time, compare this output result with the first translation. If there is no significant semantic difference between the two, it is considered that the translation result has been proofread. This module not only improves the teachers' quality, but also improves the students' English quality, literature quality, reading quality and their enthusiasm for learning.

4.2.3 Construction of Linguistic Translation Theory and Literary Intelligent Translation Proofreading Norms

If we want to completely improve the existing problems of literary intelligent translation proofreading, we need to build linguistic translation theory literary intelligent translation proofreading norms to control and evaluate the proofreading process and results, so as to ensure that this link can develop healthily and sustainably. The method of this paper is to evaluate the quality of text improvement after training the samples, take the network output as the evaluation result, and construct an evaluation model of literary intelligent translation text improvement quality through the Internet of Things architecture.

The biggest feature of translation work is its internationalization. Therefore, when constructing translation proofreading standards, it is necessary to refer to foreign linguistic translation theories. While conducting a horizontal comparison of translation and proofreading standards in different countries, refer to the development trend of the translation field, and make corresponding adjustments to this standard according to different text types. According to the different aspects of linguistics, each link in the translation and proofreading work should be stipulated, and this rule should be detailed as much as possible, and the corresponding operating specifications should be given. No matter which school, it is bound to provide guidance for the improvement of literary intelligent translation. Linguistic translation theory literary intelligent translation proofreading specification construction results need to meet the current translation service market standards, and provide guarantee for translation results.

5 CONCLUSION

The improved method of literary intelligent translation text based on generation confrontation network can realize the detection of grammatical mistranslation features. The number of grammatical mistranslation features in each grammatical feature sample set detected is very close to the number of mistranslation categories in the corresponding data set. It can be seen that the mistranslation feature detection effect of this method is good. The stability of the improved method is good, and the improved results are accurate and reliable. After the improvement of literature, students' literary literacy has been significantly improved. There are also significant differences in Teachers' literacy before and after the improvement of intelligent translation of literary works. Teachers can better integrate into students and make students interested in literary works, so

as to strengthen students' reading literacy and English literacy. In this paper, 10 types of grammatical mistranslation are used as the detection objects to correct the grammatical mistranslation in the experimental part of the corpus. However, when emotional texts are generated in different scenarios, there are some deficiencies in emotional information. In future research, it is necessary to increase the proportion of current semantic information and emotional information, so as to ensure the text quality and conform to the current context.

6 REFERENCE

[1] Wu, J. (2019). Practice Analysis on the Teaching Theory and Skills of English Translation. *A Review of Educational Theories*, *2*(1), 6-10. https://doi.org/10.30564/ret.v2i1.300

[2] Wu, X. (2020). Study on English-Chinese Translation System Based on Human-Computer Interaction and Feature Extraction. *Microcomputer applications*, *36*(4), 126-128.

[3] Xia, Y. (2020). Research on statistical machine translation model based on deep neural network. *Computing*, *102*(3), 643-661. https://doi.org/10.1007/s00607-019-00752-1

[4] Xia, C. & Jing, Z. (2018). English translation of classical Chinese poetry. *Orbis Litterarum*, *73*(4), 361-373. https://doi.org/10.1111/oli.12184

[5] Liu, W., Qin, C., Gao, K. et al. (2019). Research on medical data feature extraction and intelligent recognition technology based on convolutional neural network. *IEEE Access*, *7*, 150157-150167. https://doi.org/10.1109/ACCESS.2019.2943927

[6] Uba, S. Y. & Souidi, N. M. (2020). Students' Writing Difficulties in English for Business Classes in Dhofar University, Oman. *International Journal of Higher Education*, *9*(3), 86-97. https://doi.org/10.5430/ijhe.v9n3p86

[7] Zhu, X., Lou,Y., Deng, H. et al.(2020). Leveraging bilingual-view parallel translation for code-switched emotion detection with adversarial dual-channel encoder. *Knowledge-Based Systems*, *235*,107436. https://doi.org/10.1016/j.knosys.2021.107436

[8] Liu, J. (2020). Mark Bender's Translation and Introduction of Plants and Animals in the Nuosu Book of Origins. *Philosophy*, *12*(5), 280-286.

[9] Chai, J. (2021). Intelligent English automatic translation system based on artificial intelligence support vector machine. *2021 4th International Conference on Information Systems and Computer Aided Education*, 572-576. https://doi.org/10.1145/3482632.3482753

[10] Liu, W., Paxton, C., Hermans, T. et al. (2022). Structformer: Learning spatial structure for language-guided semantic rearrangement of novel objects. *2022 International Conference on Robotics and Automation (ICRA)*, 6322-6329. https://doi.org/10.1109/ICRA46639.2022.9811931

[11] Nerabie, A. M., Al Khatib, M., Mathew, S. S., Barachi, M. E., & Oroumchian, F. (2021). The impact of Arabic part of speech tagging on sentiment analysis: A new corpus and deep learning approach. *Procedia Computer Science*, *184*, 148-155. https://doi.org/10.1016/j.procs.2021.03.026

[12] Liu, D., Li, J., Du, B. et al. (2021). A hybrid neural network approach to combine textual information and rating information for item recommendation. *Knowledge and Information Systems*, *63*(3), 621-646. https://doi.org/10.1007/s10115-020-01528-2

[13] Wang, R., Ma, X., Jiang, C., Ye, Y., & Zhang, Y. (2020). Heterogeneous information network-based music recommendation system in mobile networks. *Computer Communications*, *150*, 429-437. https://doi.org/10.1016/j.comcom.2019.12.002

[14] Yi, H. (2020). Educational resource online evaluation system based on neural network dynamic feedback algorithm. *Journal of Intelligent & Fuzzy Systems*, *38*(6), 7253-7265. https://doi.org/10.3233/JIFS-179801

[15] Dong, K., Sun, Y., Xie, Z., & Zhen, J. (2020). How to Bid Success in Crowdsourcing Contest? - Evidence from the Translation Tasks of Tripadvisor. *Journal of Systems Science and Information*, *8*(2), 170-184. https://doi.org/10.21078/JSSI-2020-170-15

[16] Xie, S. (2020). English Research Article Titles: Cultural and Disciplinary Perspectives. *SAGE Open*, *10*(32), 654-673. https://doi.org/10.1177/2158244020933614

[17] Yuliani, S. (2020). Initial Need Assessment on English Teaching Based on Riau Malay Folklore: Digital Innovation in Preserving Culture. *Education Quarterly Reviews*, *3*(32), 555-565. https://doi.org/10.31014/aior.1993.03.01.118

[18] Aimsamrarn, P., Janyachareon,T., Rattanathanthong, K., Emasithi, A., & Siritaratiwat, W. (2019). Cultural translation and adaptation of the Alberta Infant Motor Scale Thai version. *Early Human Development*, *130*, 65-70. https://doi.org/10.1016/j.earlhumdev.2019.01.018

[19] Wang, E. H., Singh, P. V., & Argote, L. (2019). Jack of all, master of some: Information network and innovation in crowdsourcing communities. *Information Systems Research*, *30*(2), 389-410. https://doi.org/10.1287/isre.2018.0804

[20] Wang, G. (2020). Functional Discourse Analysis and College English Teaching. *Open Access Library Journal*, *9*(5), 1-9. https://doi.org/10.4236/oalib.1108796

[21] Altahmazi, T. (2020). Creating realities across languages and modalities: Multimodal recontextualization in the translation of online news reports. *Discourse, Context & Media*, *35*, 100390. https://doi.org/10.1016/j.dcm.2020.100390

[22] Bateman, S. (2020). Exploring reproduction (or is it procreation?) over language boundaries: the challenges and hidden opportunities of translation. *Reproductive Biomedicine & Society Online*, *11*(4), 30-41. https://doi.org/10.1016/j.rbms.2020.09.002

[23] Sutrisno, A. (2020). The Accuracy and Shortcomings of Google Translate Translating English Sentences to Indonesian. *Education Quarterly Reviews*, *3*(4), 1-15. https://doi.org/10.31014/aior.1993.03.04.161

[24] Anible, B. (2020). Iconicity in American Sign Language–English translation recognition. *Language and Cognition*, *12*(1), 138-163. https://doi.org/10.1017/langcog.2019.51

[25] Bălăcian, D. & Scarlat, E. (2021). The Cybernetic System of the Global Economy with Influences of Climate Change on the Evolution of IT. *Economic Computation and Economic Cybernetics Studies and Research*, *55*(1). https://doi.org/10.24818/18423264/55.1.21.02

[26] Law, J., Ong, J. W., & Aziz, K. A. (2022). Leveraging on social entrepreneurship process to safeguard the cultural heritage. *Journal of Logistics, Informatics and Service Science*, *9*(3), 16-30.

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