

Research Article

Automatic Anomaly Monitoring Research of Business English Literature Translation Based on Decision Tree Intelligent Analysis

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As an important language tool, literature in business English defines rights and obligations in business activities from the perspective of literature translation. This article discusses business English from the perspective of literature translation, which should not only preserve the characteristics of literature, but also ensure the smooth and correct language. In order to improve the accuracy of the automatic translation of business English literature and optimize the design of the teaching platform for business English literature translation, a design method of the teaching platform for business English literature translation based on the decision tree logistic model is proposed. The platform design consists of two modules: automatic translation algorithm design and software development of the platform. Using the decision tree logistics model to analyze the semantic features of business English translation and context feature matching and adaptive semantic variable optimization method to analyze automation lexical features of business English translation and to extract the correlation between vocabulary and vocabulary characteristics, in the context of a specific business translation difference correction, the accuracy of English translation is improved. The software design of the platform is carried out under the decision tree logistics model. The platform construction is mainly divided into vocabulary database module, English information processing module, network interface module, and human-computer interaction interface module. B/S framework protocol is used for integrated development and the design of translation platform. According to the characteristics of the data business application and the particularity of data security risk monitoring, from business English requirement analysis, the study of business English translation behavior monitoring ability and analysis in the process of abnormal behavior monitoring techniques and methods, including data access, data processing, experience in engine, and model engine puts forward the future research direction. The platform test results show that this method has good accuracy and strong automatic translation ability in business English literature translation.

1. Introduction

In terms of vocabulary, the prominent features of the translation language of business English literature are the normalization of the words used in the translated texts and the emergence of new word combinations. This new combination of words reflects the characteristics of lexical collocation in translated texts [1]. What are the specific features of lexical collocation in the translated text? Foreign countries have carried out preliminary research on collocations of corpus-based translation texts, but there is still a lack of systematic empirical research in this area. This article explores the collocative features of the Chinese-English

translation of business English literature in order to help the teaching and research of Chinese-English translation.

With the machine translation technology matures, using machine translation to English literature translation plays an important role in shortening the time of human translation, improving the efficiency of translation, researching based on machine translation of English literature translation method, promoting English education, and enhancing the efficiency of the reading of foreign literature. Influenced by the uncertainty and randomness of the context of business English literature, the accuracy of the machine translation is not good, lead to business English literature to business English translation teaching platform of optimal design,

combined with business English literature algorithm to improve the design of the machine translation, improve the efficiency and the accuracy of business English translation. Research on relevant teaching platform design methods has attracted great attention [2, 3].

Machine algorithm for business English translation at present mainly adopts the limit of machine learning algorithm, support vector machine (SVM), English translation correction algorithm, and regression analysis methods such as Refs. [4–6] and, with the semantic features of business English translation language environment in the process of analysis and automatic feature matching, improves the accuracy of business English translation. Based on this, the teaching platform of business English literature translation is designed to improve the teaching quality [7]. Business English translation is a required course for senior English majors, usually lasting one or two semesters. At present, with the advancement of college English teaching reform, business English translation is also selected as one of the extension courses of ESP in most colleges and universities. Throughout the curriculum, there is corresponding lag in the teaching content, teaching mode, teaching means, evaluation system, and other aspects [8]. Business English translation teaching materials have been published on the market although they are rich contents and in various forms, but the teaching material of the backward information disconnect and old instance, rigid, and business text relevance and pertinence is not strong, the update speed lags far behind the pace of real business information, and it is difficult to meet the actual needs of students and more difficult to adapt to the needs of society [9]. In addition, English language teachers lacking relevant business work experience are still the teachers of business English translation courses in most colleges and universities, so the teaching content within the limited class hours inevitably puts too much emphasis on the translation theory and translation skills, and lacks translation practice and practical teaching. The comprehensive evaluation system based on classroom performance, in-class tests, and students' completion of homework has become the main evaluation method of business English translation courses in most colleges and universities [10]. However, this static and closed evaluation method cannot timely, flexibly, and effectively show students' practical participation in the learning stage, nor can it reflect students' mastery of knowledge points in the learning process. Even though some colleges and universities add project assessment into formative assessment and carry out translation activities for specific business texts such as trademark advertisements, foreign trade letters, business contracts, and enterprise publicity, the texts selected for assessment projects are still designated by teachers themselves, which is also unscientific and cannot be assessed dynamically in an all-round way. There is little interaction in class, after-class comments lag behind, and students' drive is weak, forming a vicious circle that affects the learning effect. Business English translation requires students not only to master language and cultural knowledge and business knowledge, but also to be familiar with international trade, international law, and other relevant knowledge, as well as

the translation technology widely used in practical translation business, such as computer-aided translation tools, translation memory technology, terminology database, and bilingual parallel corpus [11–13]. These knowledge and techniques are directly pushed by teachers in class. In the learning process of students, the diversification, digitalization, and fragmentation of the teaching content and learning resources can be realized through rain classroom, so that students can independently decide the number and time of watching teaching videos, learn knowledge points repeatedly anytime and anywhere, and master their learning progress flexibly. At the same time, teachers can monitor and understand students' autonomous learning progress through rain classroom tools, which is convenient for teachers to conduct classroom management.

At present, the research on collocations of translated texts can be divided into three categories: translation texts and collocations. The collocations of palliative words in translated texts are wider than those in native texts [14]. However, compared with nontranslated texts in the same register, the number of collocation words in node words in translated texts is less: a study on collocation regularization in translated texts. This partially confirms the trend of normalization of abnormal collocation combinations in translated texts [15]. There are abnormal word combinations in the translated text relative to the original language. Translation languages tend to reflect the combination of words with the severity of SARS, but this tendency is influenced by the source language and the analyzed words [16–18]. This partly confirms the existence of abnormal collocation in translated texts. In general, the collocation mode of translated texts is different from that of native texts [19–21], and such collocation mode is likely to be universal. However, the above methods have great contextual interference in large-scale translation of business English literature, resulting in poor translation accuracy. In order to solve this problem, this article puts forward intelligent analysis model based on decision tree business English translation teaching platform design method, using context feature matching and adaptive semantic variable optimization method to analyze automation lexical features of business English translation, in the context of a specific business translation difference correction, and improves the accuracy of the English translation. The software development design and simulation experiment analysis of the teaching platform of business English literature translation are carried out, and the validity conclusion is drawn.

2. Decision Tree Intelligent Analysis of Business English Literature Translation Algorithm Design

2.1. Decision Tree Intelligent Analysis Model for Business English Document Translation. Logistics model is used to analyze semantic features of business English literature translation. As a typical chaos model, the logistics model is characterized by randomness and sensitivity to initial features. Semantic feature analysis in different contexts of

Business English has the advantage of strong environmental adaptability:

$$t_n = (1 - t_n)t_n\gamma. \quad (1)$$

The above formula describes the clustered Henon attractor of business English literature translation and combines the concept set of English translation output to carry out adaptive context matching, so as to obtain the distribution model of concept set of text feature in English literature translation:

$$t^2 = \alpha + \beta t. \quad (2)$$

The semantic correction function of business English literature translation by introducing the Lorenz attractor is

$$\begin{cases} t = -\chi t + \delta t, \\ y = tz + \gamma z - y_n. \end{cases} \quad (3)$$

In terms of clustering feature extraction of business English literature translation, the semantic feature clustering process is carried out under a logistics chaos attractor in combination with the difference of semantic feature distribution between words, as shown in Figure 1.

As shown in Figure 1, according to the English translation of the clustering model, using context feature matching and adaptive semantic variable optimization method to analyze automation lexical features of business English translation. It is assumed that the length of the semantic code sequence of translated English sentences is N and the semantic distribution concept set is x , and it can be said for $N \times l$ column feature vector, using correlation semantic grouping method. The clustering model of business English literature translation is described as follows:

$$t = \sum_i t_i s_i. \quad (4)$$

According to the above model design, the semantic feature analysis and text word matching of business English automatic translation are carried out under the decision tree logistics model.

To sum up, the findings of our investigation and research on collocations of translated texts based on English analogical corpus are as follows:

There are three characteristics in the collocation mode of translated English literary texts. Simplification: compared with native English texts, the collocation mode of translated English texts is simplified; regularization: compared with native English texts, the collocation patterns of translated English texts are regularization; and anomaly: compared with native English texts, there are abnormal collocation patterns in translated English texts. Simplification and regularization features are significant, and the degree is basically the same. However, the anomaly characteristics are not significant, and the degree is lower than simplification and normalization. That is to say, compared with native English texts, the overall characteristics of English text collocation in translation are simplification, normalization, and abnormality coexist, and simplification and normalization are the main ones, supplemented by abnormality.

2.2. Optimization of Business English Literature Translation. In English technical standards, there are two types of vocabulary: general vocabulary and professional vocabulary. People tend to think that professional words are difficult to translate, so they pay more attention to them. For those more common words, they are translated according to their familiar thinking, which is more prone to mistranslation. In fact, ordinary words are difficult to translate, but professional words can be learned by consulting several dictionaries. However, ordinary words are often flexible and often have multiple meanings, which greatly increases the difficulty of understanding the meaning of the word. A seemingly common word has a different meaning in the text of technical standards. For example, the common meaning of power is power, power, great power, etc. In mechanical dynamics, it means power, power. For example, "reactor" generally means a person who reacts, but in the chemical technical standards text, it means reactor, and in the nuclear power technical standard text, it has a different meaning than the previous one, which translates to reactor or atomic furnace. Thus, some common words are given entirely new meanings in technical standard texts, and if they are still translated into ordinary definitions, the translation will lose its professional color.

Based on the above analysis of semantic features of business English literature translation by the logistics model, the machine algorithm of English literature translation is designed, and context feature matching and adaptive semantic variable optimization are adopted to obtain the optimal semantic feature matching result of English translation:

$$J(m) = \max(J(\tau) + d_m(\tau) + m). \quad (5)$$

According to the original text information, semantic discretization is carried out, and the parameter adaptive estimation of the semantic text feature quantity Y is carried out, and the feature matching degree of the output English translation output is obtained as follows:

$$p(t_n^i|\alpha) = p(t_1|\alpha, r, l) \times p(t_2|\alpha, r, l) \dots p(t_n|\alpha, r, l). \quad (6)$$

The automatic lexical feature analysis of business English literature translation is carried out, and the decomposition results E of relevant context information of English literature translation words P are as follows:

$$P_{j,k} = \frac{E_{j,k}}{E_{ij}}. \quad (7)$$

Addition and subtraction are often used in the translation of business English documents. For example, when translating Chinese subject-less sentences, it is necessary to add appropriate subjects, and pronouns and conjunctions in English are often omitted when translating into Chinese.

In terms of the expression method, business English literature uses more noun expression, while the Chinese use more verbal expression, so it is necessary to adopt in the process of translation of the part of speech conversion

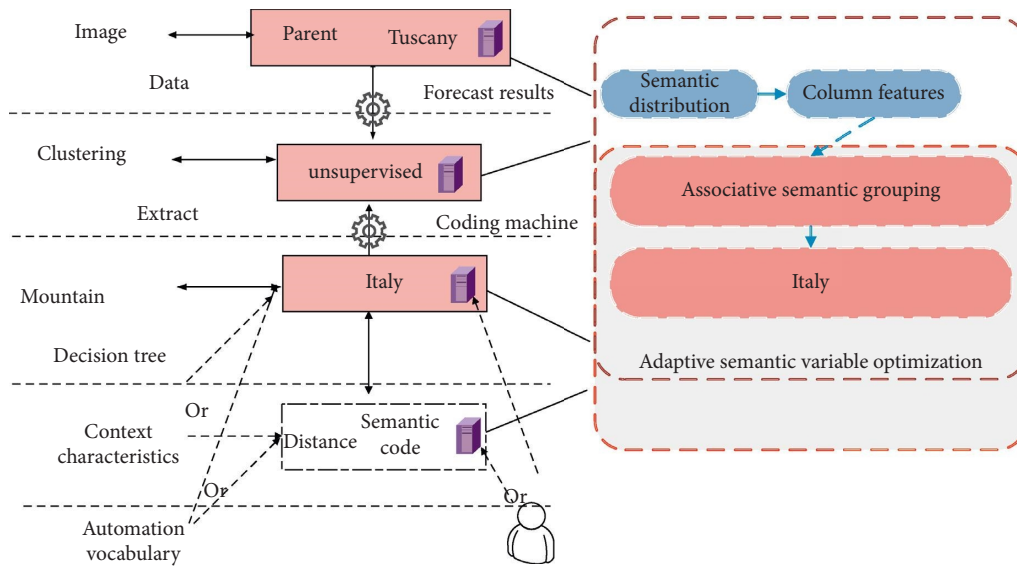


FIGURE 1: Clustering model of English translation based on the decision tree model.

method. Translate English noun expression into Chinese verb expression, so that the translation conforms to the expression of Chinese habits and is easy for readers to understand.

Passive voice is often used in English, and it is much more frequently used than in Chinese. Therefore, translators should pay attention to the conversion of voice in the translation process of English documents. Long sentences are often used in business English literature, and the processing of long sentences in English is a big difficulty. English is a “conformal” language, with many forms of connection and tree-like structure of sentence organization, so clauses and clauses are often seen in English. The following two methods can be considered in the translation of long sentences in business English literature. One is to retain the basic syntactic structure of the original text and adopt the “sentence driven” method for translation. One is to rearrange the original information according to the way of discourse organization in Chinese. Try to make our translation more accurate and complete. The specific process is shown in Table 1.

2.3. Automatic Anomaly Monitoring of Business English Literature Translation Based on Decision Tree Intelligent Analysis. For commentary-type teaching mode in business English translation classroom application, through analysis and summarizing the research achievements of previous scholars, there are two outstanding issues that need to be improved in the later teaching practice: one is the study of the previous scholars who have emphasized the exegesis-type translation individual instances of the application, but the classroom application is faced with a certain number of students; it is necessary to transform individual experience into collective experience and combine students’ autonomous learning process with classroom activities. Second, the role of teachers in the whole process of teaching practice is not obvious, and teachers’ overall control of the classroom

and the monitoring of students’ independent learning process should be reflected to some extent. In order to solve the above problems, we propose to combine annotation translation with group cooperation teaching mode, apply the hybrid teaching mode to business English translation teaching, and design the application process of annotation translation teaching mode into four main parts with the help of Internet social software.

Considering the application environment of financial abnormal data monitoring and analysis, this system adopts decision tree intelligent analysis with mature technology, ideal adaptability, and realization as recognition algorithm. Its implementation method is as follows:

- (1) Determine the number of input layer neurons for decision tree intelligent analysis by the number of input features and the coding bits of each feature.
- (2) Determination of the middle layer. According to experience, the middle layer is usually 1, and the number of neurons in the middle layer is $2 * N$, which can be adjusted according to the actual situation. Neuron correlation function is generally selected as a general.
- (3) Output layer design. The number of neurons in the output layer is equal to the number of demand classification, One_Hot encoding is adopted to encode demand state, and the output neuron function is selected as Logsig function.

So far, the intelligent analysis of decision tree has been designed. The processed data are used to train the intelligent analysis of decision tree. The training method is shown in Figure 2.

Students independently complete the professional translation materials provided by teachers. In this process, students, as translators, apply the several steps of commentary translation, which can be divided into ① analysis of original text; ② translation; ③ find the problem; ④ think

TABLE 1: Call sequence generation of the intelligent analysis of decision tree.

Run program P in PIN
 The symbolic information set S of all executable modules in the process space was obtained by translating the business English literature of the image
 Translate business English literature at the instruction level and judge the executable module of each instruction
 Carry out function-level translation of business English literature and obtain the address range of each function
 Translate basic block business English literature, query corresponding modules and function symbols in S according to the jump address of basic block, obtain function parameters combined with instruction-level business English literature translation tree, and obtain information F of each API
 Combined with function-level business English literature translation tree, the API call sequence corresponds to each function with detection program, and the API is gradually sorted out.
 The call is the runtime dynamic control flow for the node, and the function boundary interval is inserted into the API sequence, forming the sequence SeqU
 Returns the SeqU

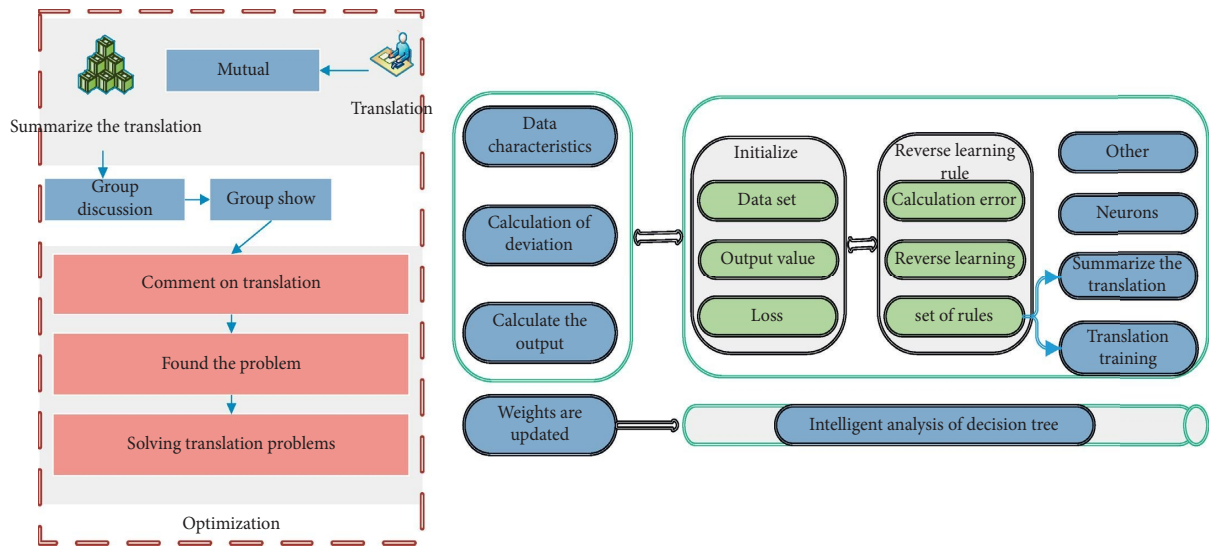


FIGURE 2: Training process of intelligent analysis of decision tree.

about the method and way to solve the problem; ⑤ solve problems; ⑥ review and reflection; and ⑦ overall evaluation. From problem discovery to overall evaluation, students will complete the translation practice process to make a written record and hand in homework as a group.

First of all, students should be divided into groups according to their English scores: 4 students in one group; there are 24 students in the class, so they are divided into 6 groups; arrange the order of group presentation, and complete the group presentation every two weeks. Confirm that the group members are responsible for organizing and arranging group activities, and the group members also have flexible division of labor. After each member completes the translation independently, they discuss in the group and find out each other's mistakes. Then, they summarize each version of the translation and complete multiple versions of the translation. During the preparation process, teachers organize small groups, conduct video conferences with group members, monitor the entire group discussion process, and provide guidance.

The design of the teaching platform of business English literature translation includes two parts: machine translation algorithm design and software design. On the basis of

the algorithm design, the software design of the teaching platform of business English literature translation is carried out in the embedded environment, and the software design of the platform is carried out under the logistics model. The platform is mainly divided into vocabulary database module, English information processing module, network interface module, and human-computer interaction interface module. The platform design is based on B/S architecture and adopts cross-compilation and multithread input control methods to carry out computer compilation and program control of business English literature translation teaching platform.

In the design of vocabulary database module, the program is loaded with data of specified length. Vocabulary database module is the basis of the design of the whole English translation teaching platform. Vocabulary database is designed by MySQL, and information fusion of business English literature translation vocabulary is carried out through FIFO RAM buffer. Based on the B/S architecture system, the embedded development of the database of the teaching platform for business English literature translation is carried out. With S3 C2440 microprocessor as the core, database modeling and information management are carried

TABLE 2: Automatic anomaly monitoring algorithm.

```

virtual int readFD(int English documen*buffer Logistics model.) int*err;// Program loading control
virtual INT WRITE SEMANTIC VARIABLE(int vocabulary) const char*buffer int English translation int*err;// Writes to the specified device
**bool read PLATFORM SOFTWARE(SF man machine &pPacket);// Packet handler
**bool WRITEPACKET(Logistics model &pPacket);

```

out. The following drivers are constructed for cross-compilation, as shown in Table 2.

2.4. Experimental Design. A total of 500 business English literature translation results of a certain enterprise were selected, among which 50 were abnormal data, which were original data to verify the effectiveness of the system. The selected characteristics of the system are as follows: the city of business trip is divided into 3 categories, the duration of business trip is divided into 3 categories, the difference of arrival and departure time of adjacent vehicles is divided into 2 categories, and the average daily reimbursement amount is divided into 3 categories. The output is of two types: abnormal 0 and normal 1.

Due to the small amount of abnormal data in the system, 400 abnormal data are generated in the dataset according to the anomaly rules and then added to the data set. Relevant parameters of business English literature translation design are shown in Table 3.

A total of 900 data were randomly divided into two groups: 800 as training sets and 100 as test sets, to train automatic anomaly monitoring of decision tree intelligent analysis. The final test results show that 51 of 54 normal data and 45 of 46 abnormal data are correctly identified in the test set, and the comprehensive recognition success rate is 96%. The automatic anomaly monitoring model of the decision tree intelligent analysis is used to identify 50 anomaly data in the original data, and 45 of them are correctly identified, with a correct rate of 90%.

3. Results and Analysis

The simulation experiment of business English literature translation teaching platform adopts MATLAB and TinyOS2 design. The data transmission frame number of English literature translation is set to 1200, the number of English text packets to be translated is 128 Mbit, the number of training sample set of business English literature is 12, and the maximum sampling time of semantic features is 24. According to the above simulation parameter setting, the method in this article and the traditional method are adopted to conduct English literature translation test, and the correctness of business English literature translation using this platform is analyzed. The test results are shown in Figure 3. According to Figure 3, the method adopted in this article has higher accuracy in business English literature translation and lower error codes in output translation.

The time response ability of the English translation teaching platform was further tested, and the results are

TABLE 3: Setting table of automatic anomaly monitoring parameters for intelligent decision tree analysis.

Parameter	Value
Number of neurons in input layer	12
Number of neurons in output layer	3
Number of hidden layer neurons	23
Training goal	0.02
Vector	0.04
Output neuron function	Logsig

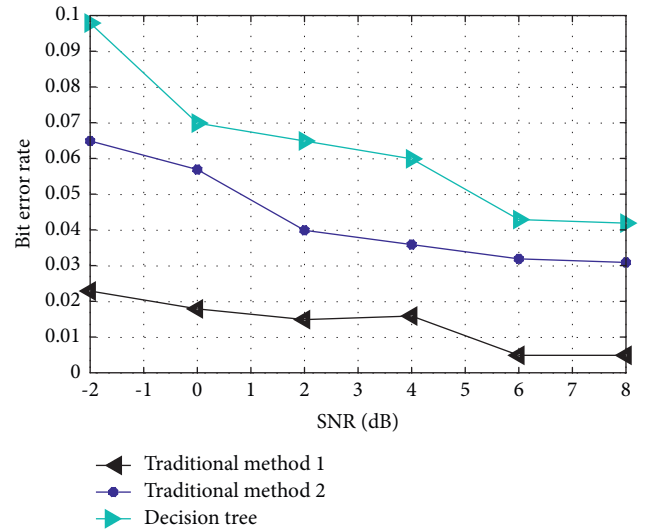


FIGURE 3: Comparative test of accuracy of English translation.

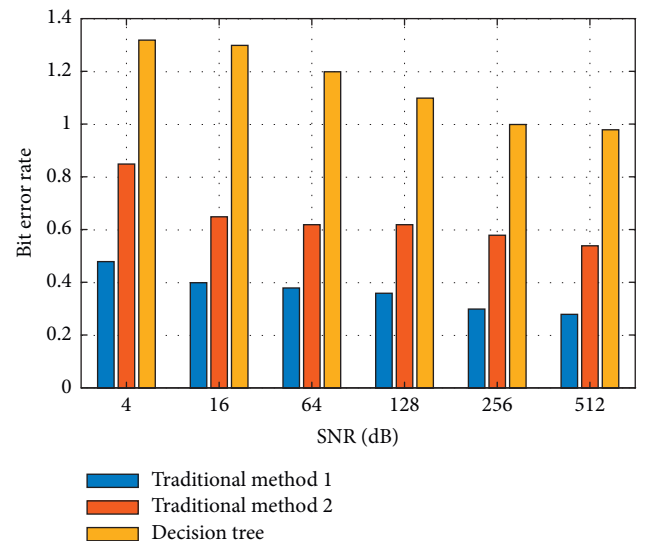


FIGURE 4: Time performance comparison.

shown in Figure 4. According to Figure 4, the time cost of business English literature translation teaching platform designed by this method is low in English translation.

Select a sliding window; when the data flow of automatic anomaly monitoring of decision tree intelligent analysis occurs abnormal, the state of the data flow will change dramatically. When frequency fluctuations is 0.02 Hz, the proposed method can through the tiny deviation of frequency fluctuations in global information fast intelligent monitoring the decision tree analysis of automatic monitoring data stream anomaly data, the proposed method and literature method of decision tree intelligent analysis of automatic monitoring data flow anomaly state monitoring time-domain diagram as shown in Figure 5.

LPCC parameters and Δ LPCC parameters of the extracted decision tree intelligent analysis of automatic anomaly monitoring of business English literature translation are shown in Figure 6.

In order to analyze the influence of training sample error labeling on recognition performance after SVDD (support vector data description) improvement, a comparative experiment is set up in this article. Taking automatic anomaly monitoring of decision tree intelligent analysis as an example, when training samples contain different numbers of labeled error samples, the recognition results of trained SVDD and improved SVDD on test samples are shown in Table 4. Among them, SVDD parameters before and after improvement kept the same. In the comparison experiment, 200 groups of automatic anomaly monitoring based on the intelligent analysis of decision tree and 6000 sound frames extracted after frame segmentation and window addition were selected as training samples, and 100 groups of automatic anomaly monitoring based on intelligent analysis of decision tree and 200 groups of others were selected as test samples.

Then, FPR and TPR under different outlier fractions were calculated to draw the ROC curve, as shown in Figure 7.

As can be seen from Figure 7, the average AUC value corresponding to the improved decision tree intelligent algorithm is about 0.865, while the average AUC value corresponding to the traditional forests algorithm is about 0.735. It can be seen that the improved decision tree intelligent analysis algorithm performs well in the automatic anomaly monitoring dataset of business English literature translation.

Figure 8 shows the change in accuracy with outlier fraction obtained by using the improved intelligent decision tree analysis algorithm and the original decision tree algorithm for the dataset.

According to the analysis of Figure 8, when outlier fraction is the same, the accuracy of the improved algorithm is generally higher than that of the original decision tree algorithm. When the accuracy is the highest, the overall accuracy can be improved by about 4%.

The intelligent analysis of decision tree can also add collaborative teachers to select excellent translations from students and invite other teachers teaching this course to jointly evaluate them. The evaluation process can be completed online directly. At the same time, teachers can obtain

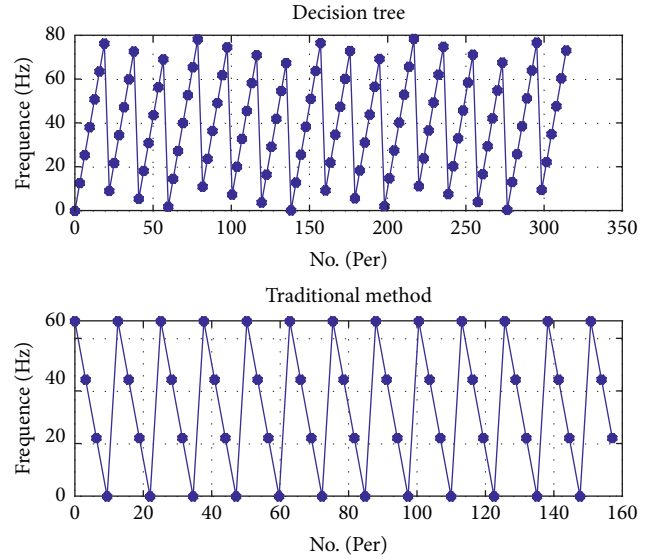


FIGURE 5: Time-domain diagram of abnormal state monitoring.

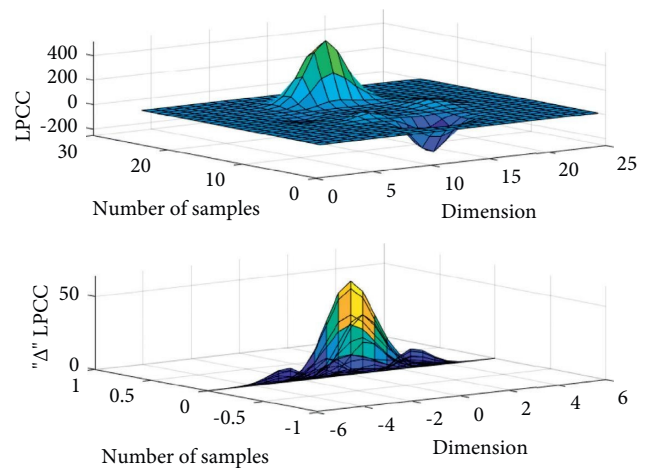


FIGURE 6: Decision tree intelligent analysis of LPCC and Δ LPCC feature parameters for automatic anomaly monitoring of business English literature translation.

TABLE 4: Training samples contain recognition results under different number of labeling error samples.

Mark the number of error samples	Accuracy of SVDD (%)	Improved SVDD accuracy (%)
0	98.2	98.3
4	86.5	98.1
12	73.36	94.78
16	69.56	89.2
22	68.45	80.78

all the learning data of this semester free of charge in the decision tree intelligent analysis web page, which is convenient and fast. The change of evaluation means that the teaching of business English translation is no longer “irreversibility.” Teachers do not have to wait until the next teaching to correct the problems and shortcomings found in

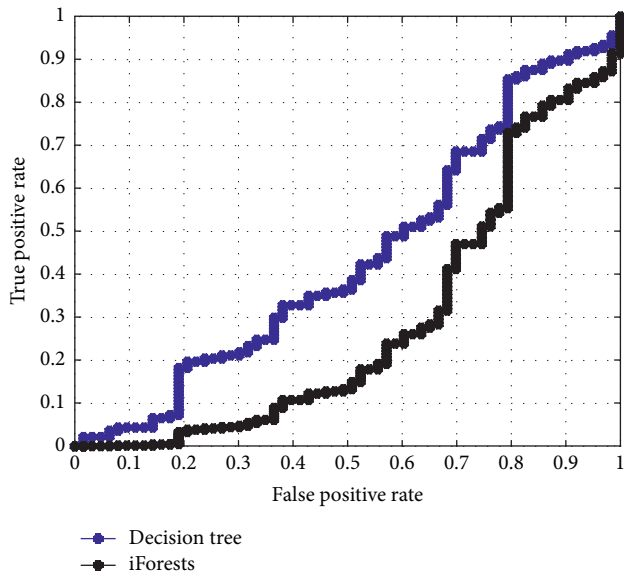


FIGURE 7: ROC curve of automatic anomaly monitoring of business English literature translation based on intelligent decision tree analysis.

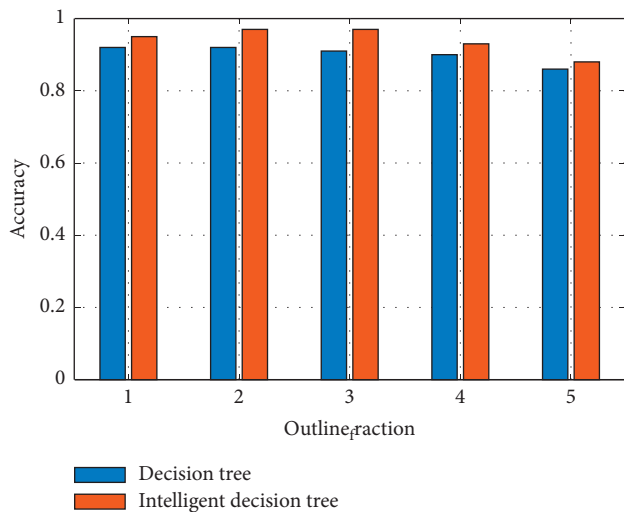


FIGURE 8: Automatic anomaly monitoring accuracy.

this teaching, which maximizes the pertinence and flexibility of teaching and achieves the innovation of the evaluation system of business English translation courses.

4. Conclusion

We put forward the model based on decision tree intelligent analysis of logistic business English translation teaching platform design method, and context feature matching and adaptive semantic variable optimization methods are used to analyze the automatic lexical features of business English literature translation, and to correct the differences of translation under specific business background, so as to improve the accuracy of English translation. The research shows that the business English literature translation

teaching platform designed in this article has advantages in terms of time response and accuracy of English translation. International business English is an important language tool for people engaged in international business activities. With China's successful entry into the World Trade Organization, international business English is more and more widely used. The document in international business English describes the rights and obligations related to the document in the form of a book, which is an essential part of international business activities. People should carry out normal international business activities under the conditions permitted by the documents, so as to ensure its legality and the rights and interests of the parties are not violated. Through this article, we can understand the language characteristics, novel translation standards, and translation principles of international business English documents and acquire knowledge about the translation skills of international business English documents.

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 or personal relationships that could have appeared to influence the work reported in this article.

Acknowledgments

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