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Research Article

International Trade English Phrases and Grammar Translation

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With the frequent occurrence of international trade communication, in order to improve the quality of communication, this paper proposes a study on the translation of international trade English phrases and grammar. First, with the help of a rectangular window function, the composition principle of international trade English phrases is determined. Then, the horizontal feature aggregation point method is introduced to build a mathematical model of the characteristic identification of the English phrases. Finally, the sparse matrix representation of the source phrase is constructed to complete the extraction and preprocessing of the English phrase features. The input English sentence is converted into the output sentence, the form and POS factors of the English semantic translation are extracted, and a lemma is introduced to obtain the surface form of international trade English language factors. According to the international trade grammar analysis method, this paper decomposes the translation model, decomposes English sentences into small phrases for translation, and completes the research on international trade English phrase and grammar translation. The experimental results show that this method has high accuracy in the feature extraction of international trade English phrases, and the error rate is low, which is feasible.

1. Introduction

With the continuous strengthening of the global economic level, China's international trade level is also expanding. Therefore, the role of English is becoming more and more important. At the same time, the translation of international trade English phrases and grammar has become the key to smooth communication [1]. English exists as an official language, and the reason why English is widely used is mainly due to economic reasons. Economic development drives the use of language, and business English occupies an important position in international business transactions. Trade internationalization refers to the production of goods in a country and then transnational trade activities. International trade activities mainly include import trade and export trade. This trade activity is of great significance to the economic development of countries participating in trade. First, it regulates the relationship between supply and demand in the markets of various countries, At the same time, it promotes full differentiation of the utilization of production factors, further improves the production efficiency of trade among countries through the comparison of their advantages, improves the level of production technology, then enhances fiscal revenue, which is conducive to the improvement of national welfare level, strengthens the economic ties among countries to a considerable extent, and promotes the development of the world economy [2]. With the continuous development of business, business English contains more and more contents and further expands its meaning. On the original basis, it also includes the English used by people at all social levels in business activities. It not only includes the professional language of business but also includes the professional knowledge of business and business communication ability [3]. For further expansion, convenient communication methods can enable enterprises to select enterprises that meet the requirements in a short time. After determining partners, both parties should negotiate on important matters such as the specific content of cooperative business [4]. Business English is particularly important here, which can help enterprises obtain important cooperation information in the negotiation process. This information may be related to the handling of disputes in future trade cooperation. In the process of trade, enterprises obtain effective information, strive for the autonomy of trade activities, and grasp the offer of trade cooperation more quickly and accurately [5], so that enterprises can seize the

opportunity in time in the fierce market competition. At the same time, the rapid establishment of partners not only improves the efficiency of enterprise cooperation activities but also saves a certain cooperation cost for enterprises.

It is not difficult to see that, in the process of international trade activities, both parties use business English to exchange opinions and information, so as to further promote the trade activities of enterprises. In addition, with the rapid development of domestic economy, many enterprises have developed into multinational enterprises. At the same time, talents from all over the world flow into China, making some nondomestic employees in Chinese enterprises. Communication has become one of the difficulties [6]. The most effective way to realize effective communication among enterprise personnel is to use English, while business English is more effective than others. It has a more professional and standardized way of communication, promotes active communication among enterprise members, improves the business English ability of enterprise employees, and reduces the resistance in the future international development of the enterprise from a long-term perspective. Therefore, the study of international trade English phrase and grammar translation has become a hot issue in this field.

Therefore, this paper conducts a study on the translation of international trade English phrases. The proposed system uses rectangular window function to determine the composition principle of an input sentence or phrase. The horizontal feature aggregation point method is introduced to build a mathematical model of the characteristic identification of the English phrases, and finally the sparse matrix representation of international trade English source phrase is constructed to complete the extraction and preprocessing of the phrase features. The input English sentence is converted into the output English sentence, the form and POS factors of English semantic translation are extracted, and a lemma is introduced to obtain the surface form of the English language factors. Finally, small phrases are generated by decomposing the sentences for translation.

The main contributions of this research work include the following. An English semantic translation training mechanism is constructed using the automatic automation tool on the English corpus, and word matching is carried out according to the surface form and other context factors. Based on this model, we construct the semantic ontology model of the English grammar translation.

The rest of the paper is organized as follows: in section 2, we discuss some of the related studies. Section 3 discusses the extraction and preprocessing of the English phrases. Section 4 describes the translation process of the phrases. In Section 5, we discuss the experimental setup of the proposed system, Section 6 is the discussion about the results and the detailed comparison of the results, and Section 7 is the conclusion of the research work.

2. Related Work

Literature [7] proposed an English translation method based on Drosophila algorithm to optimize rough set feature selection. This method is used to study the translation of international trade English phrases and grammar. In the research of this method, aiming at the shortcomings of low accuracy and large error in the current English noun phrase translation, an English translation method of rough set feature selection based on Drosophila optimization algorithm is proposed. With the least feature selection, the English translation accuracy is the highest. It can be seen from the comparison with SOA, SCA, and SLA that the algorithm foa-rs in this paper has higher accuracy, precision, and recall, which provides a new method and way for English translation. However, this method is relatively general and does not refine the professional research on international trade English phrases and grammar, which has some limitations. Literature [8] puts forward a study on the restrictive factors and coping principles of mechanical English translation. This method aims at the English related to machinery in international trade. Learning western advanced machinery manufacturing technologies and methods is conducive to promoting China's transformation from a "manufacturing power" to a "smart manufacturing power." Due to the characteristics of strong professionalism, various terms, and sentence patterns caused by different ways of discourse thinking, there are many constraints on the translation quality in the field of mechanical engineering. This study takes some specific practices in existing translation as examples to explore the causes and solutions of many constraints in mechanical English text translation. However, this method is only limited to the theoretical stage and has no practical application research [9].

3. Extraction and Preprocessing of English Phrases in International Trade

Business English is mostly used in international trade activities. It is an indispensable tool for both parties of enterprise cooperation in communication and negotiation. It is an exchange link between countries. Every project mentioned in trade negotiation activities involves all aspects of cooperation, and the ability level of both parties should be taken into account. Such a communication is inseparable from the use of business English. At the same time, trade activity negotiation combined with relevant negotiation skills will create many favorable conditions for enterprises to conduct international trade. Without language barriers, the two sides of trade negotiation can be in an equal position, shortening the distance between the two sides and further promoting the conclusion of trade activity negotiation. Therefore, the movement and understanding of international trade English has become the key [10]. Among them, the characteristics of international trade English phrases are the first step in their communication. Therefore, this paper first determines the characteristics of international trade English phrases.

Before determining the characteristics of international trade, we should analyze the grammar rules of international trade English phrases. This article makes Gaussian marginalization on the semantic of international trade English

phrases to obtain the rectangular window function [11], obtain the feature vector of international trade English phrases, and then project the semantic information entropy data. Let two international trade English phrase semantic features converted into directed graphs are D_1 and D_2, the intersection of the two is D_i, translation of English input variables at i time with $\{c_{i1}, c_{i2}, \ldots, c_{im}\}$, and the corresponding statement type is b_i; the overall criterion of international trade English phrase is as follows:

$$a_{\max} = \max - \frac{b_i\{c_{i1}, c_{i2}, \ldots, c_{im}\}}{D_i(D_1, D_2)}\left\{a_{xy}\right\} f(c_1, c_2). \quad (1)$$

In equation (1), a_{xy} is the mapping relationship between the English phrases and $f(c_1, c_2)$ is the joint probability density function between them.

According to the above overall criteria of international trade English phrases [12], a horizontal feature quantity aggregation method is introduced to build a mathematical model of the characteristic identification of the English phrases, that is,

$$b_i = \frac{f(c_1, c_2, \ldots c_m)}{f(c_1, c_2)} \cdot a_{\max}. \quad (2)$$

At this time, the sparse matrix is expressed as

$$r(t) = v(t) + je(t)h(t) \times b_i. \quad (3)$$

Among them, $v(t)$, $je(t)$, and $h(t)$ represent the international trade English phrase entry interpretation, knowledge granularity, and redundancy, respectively.

On this basis, let q_i represent the international trade English phrase entry, relationship Gaussian marginalization is O_1 and O_2, rectangular window function feature vector is u_s, the characteristic of the international trade English phrase is

$$L_{ij} = \frac{q_i \times u_s}{(O_1, O_2)} \times \frac{k(t)}{\vartheta(i, j)}, \quad (4)$$

where $k(t)$ is a rectangular window function and $\vartheta(i, j)$ is a semantic block in the English phrase.

Based on the above characteristics of international trade English phrases, due to the changing social background and word environment, the above obtained features need to be preprocessed. The semantic relevance factors of international trade English phrases are added to the information entropy and information gain of the text [13], so as to obtain the semantic nonlinear spectral features and realize the feature preprocessing. The n-dimension vector in the vector space of setting international trade English phrase is expressed by d_i, the number of words in the phrase is expressed by $tf(t)$, and $i\ df(t)$ is antidocument frequency; then, the characteristic preprocessing results of English semantics are

$$w_{tf} = \frac{tf(t) \times i\ df(t)}{d_i(n)}. \quad (5)$$

The information gain in the international trade English phrase is

$$Y(a, b) = \frac{H(x) - H(X|a)}{i\ df(t)}. \quad (6)$$

In the formula, $H(x)$ is the category information entropy of the English phrases and $H(X|a)$ is the gain between the conditional entropy of the phrases.

In the feature determination of the English phrases, the composition principle of the phrases is determined with the help of rectangular window function, the horizontal feature aggregation point method is introduced, the mathematical model for feature recognition of the phrases is constructed [14], and the sparse matrix representation of source phrases of the phrases is constructed to complete their feature extraction and pretreat it.

4. A Study of English Grammar Translation for International Trade

In order to improve the accuracy and calibration rate of international trade English grammar translation, the translation is decomposed on the basis of obtaining the characteristics of the English phrases. Select the international trade English sentences to be translated, analyze the English words, and convert the output word of the English semantic translation process and translation output word into a mapping step. The input word is set as the input factor [15], and the output word is set as the output factor. The specific mapping steps are as follows.

First, convert the input international trade English sentence into the output English sentence. Secondly, the morphology and POS factors of English semantic translation are extracted. Then, the lemma is introduced to obtain the surface form of English language factors. Finally, the translation model is decomposed according to the international trade grammar analysis method, and English sentences are decomposed into small phrases for translation.

All English sentences in the grammar translation model of international trade English need to be trained and annotated with other external context factors of international trade English. Using the automatic annotation tool on the international trade English corpus, an English semantic translation training mechanism is constructed, and word matching is carried out according to the surface form and other external context factors. It realizes the generation table of international trade English semantic translation in all mapping steps and sets scoring rules to help users choose between fuzzy mappings of English semantic translation.

Based on the above construction of English grammar translation model, this paper constructs the semantic ontology model of international trade English grammar translation.

The quintuple model is set in the English grammar translation as $w = \{a, b, c, d, e\}$, and the fuzzy mapping of the grammar translation is set to: y: $v \longrightarrow v * [-0.5, 0.5]$:

$$y(v_i) = (v_i, 0), \quad v_i \in V. \quad (7)$$

In the formula, v represents the input factor of the translation model, v_i represents the output function of the

grammar translation, and the phrase distribution structure model of the English grammar translation is defined as

$$w = \langle a, b, c, d, e \rangle, \quad w' = \langle a, b, c, d, e \rangle. \tag{8}$$

Furthermore, the parameters of the calibration of international trade can be obtained as

$$\Delta(p) = \begin{cases} v_k, & K = \text{round}(p), \\ b_k = p - k, & b \in [-0.5, 1.0]. \end{cases} \tag{9}$$

In the formula, b_k represents the surface form of English grammar translation of international trade, v_k represents the external contextual factors of the translation, and p represents English semantic generation dataset. We determine the characteristic parameters of the grammar translation with related semantic mapping:

$$(\overline{h}, \overline{z}) = w(((h, z_1), (w_1, z)), (h_2, z_2), (h_2, z_2)), \ldots, \cdot ((h_n, z_n), (w_n, z_n)). \tag{10}$$

Among them, $(\overline{h}, \overline{z})$ represents the amount of features in this state by international trade English grammar, w represents the semantic fusion factor, and $((h_n, z_n), (w_n, z_n))$ represents the number of samples.

The process of creating international trade English grammar is $u_j = (j = 1, 2, \ldots, n)$. Through logical fuzzy reasoning, we can create an effective semantic concept tree, so as to obtain the grammatical semantic ontology model of international trade English.

By evaluating the translation results of English machines through the semantic ontology model, the decision function can be obtained:

$$°\mathsf{F} = \Delta\left(\frac{\min_i \min_j w(w(((h, z_1), (w_1, z)), (h_2, z_2), (h_2, z_2))) + p \max_i \max_j \Delta_j^{-1}}{\Delta^{-1} p(w(((h, z_1), (w_1, z)), (h_2, z_2), (h_2, z_2))) + p \max_i \max_j \Delta_j^{-1}}\right) u_j. \tag{11}$$

The design of semantic ontology model is realized through the above formula, so as to improve the semantic fuzzy matching ability of international trade English grammar. According to the international trade grammar analysis method, this paper decomposes the translation model, decomposes English sentences into small phrases for translation, and completes the research on international trade English phrase and grammar translation.

5. Experimental Analysis

5.1. Experimental Preparation. In order to verify the effectiveness of this method, experimental analysis is carried out. In the experiment, through the international trade English phrase and grammar translation database, 500 international trade English phrases and 500 international trade related sentences are selected. The data are collected from various sources online. In order to ensure the effectiveness of the experiment; firstly, the selected samples of phrases and sentences are denoised to keep the noise of the samples low.

In order to ensure the reliability of the experiment, relevant test parameters are selected, as shown in Table 1:

5.2. Experimental Index. According to the experimental scheme set above, the experimental research is carried out. In order to highlight the effectiveness of this research method, the experiment is carried out by comparison. In the experiment, taking the sample international trade-related sentences as samples, the features of the sample international trade-related sentences are extracted by using the methods of [7, 8], and the accuracy of the feature extraction of the three methods is tested. Three methods are used to analyze the semantic fuzzy matching power of sample international trade-related sentences and sentence translation.

6. Results and Discussion

In this section, we are going to discuss the experimental results in detail and compare our results with the results of the competitors.

Firstly, the experiment analyzes the methods of this paper, literature [7], and literature [8], which have been discussed in Section 2, to extract the features of sample international trade-related sentences. The feature extraction in this paper is mainly aimed at the sample data, and the accurate feature extraction is shown in Figure 1:

Through the experimental analysis in Figure 1, it can be seen that, with the continuous change of the number of iterations, the methods in this paper, literature [7], and literature [8] are used to extract the features of sample international trade-related sentences. The feature extraction in this paper is mainly aimed at the sample data, and there are some differences in the accuracy of feature extraction. Among them, the accuracy of this method in extracting the features of sample international trade-related sentences is the highest among the three methods. Among them, the extraction accuracy of this method is always higher than 90%, and the fluctuation is small, which verifies the effectiveness of the method. This is because this method adopts the horizontal feature aggregation method in the feature extraction of the phrases, constructs the mathematical model of the English phrase feature recognition, constructs the sparse matrix representation of the source phrase, completes the feature extraction of international trade English phrases, and preprocess them, so as to improve the effectiveness of this method.

Table 1: Parameter design.

Parameter	Figure
Sample data (bars)	1000
Similar data (bars)	400
Extraction interval (s)	0.2
Number of iterations (times)	100
Sample syntax translation error range (%)	[0, 1]

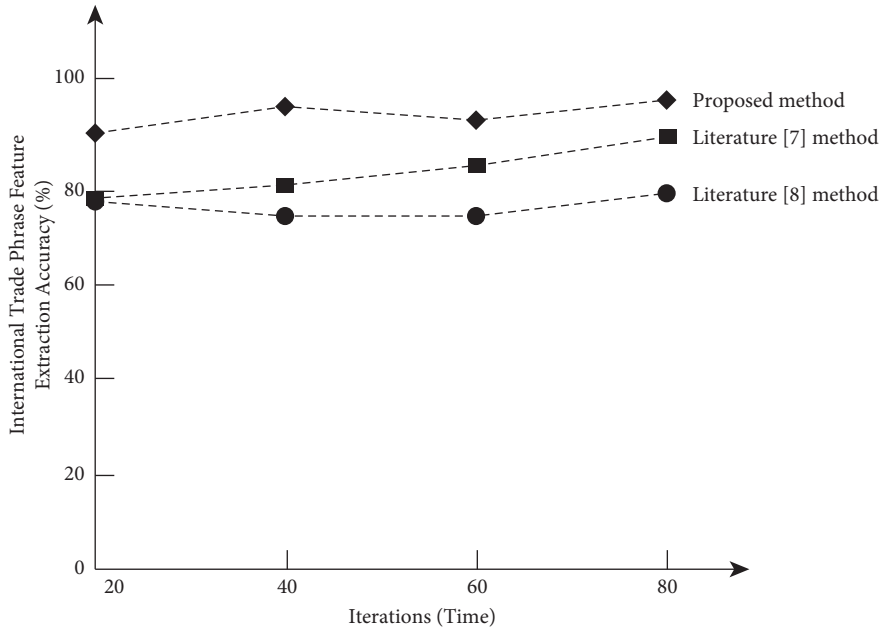

Figure 1: Characteristic accuracy analysis of international trade-related sentences and sentences extracted by different methods.

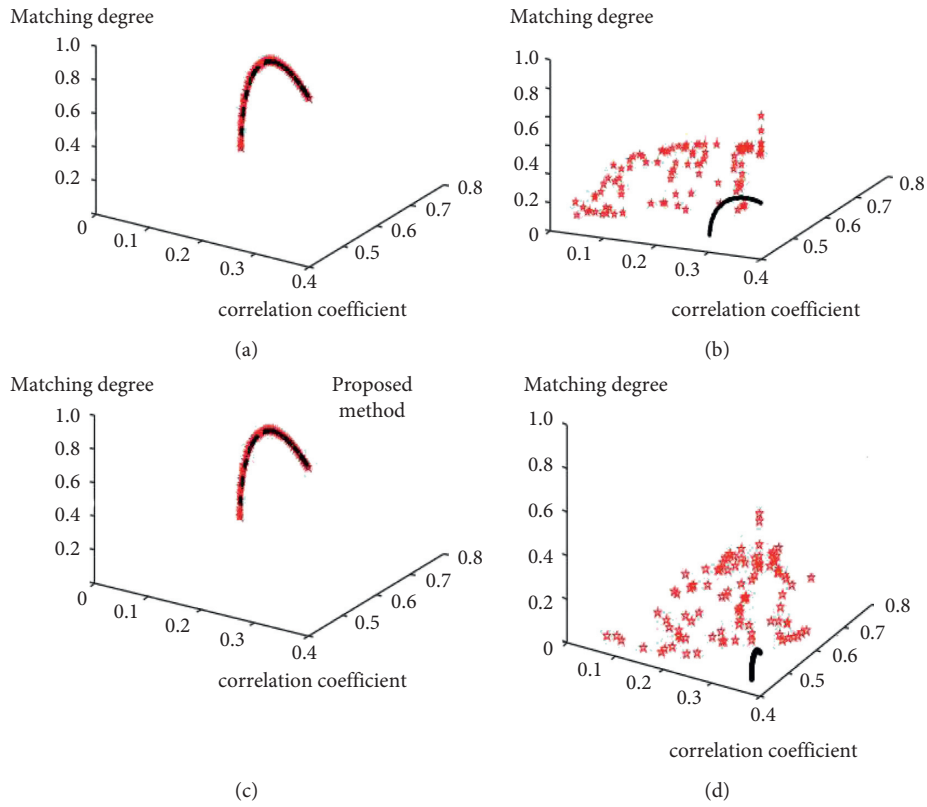

Figure 2: Analysis of semantic fuzzy matching ability of international trade with different methods. (a) Ideal matching force. (b) Methods in literature [7]. (c) Research methods in this paper. (d) Methods in literature [7].

In order to further verify the effectiveness of this method, the semantic fuzzy matching power of this method, method in literature [7], and method in literature [8] on the translation of sample international trade-related sentences is experimentally analyzed. The results are shown in Figure 2:

By analyzing the data in Figure 2, it can be seen that the semantic fuzzy matching power of sample international trade-related sentences and sentence translation is different by using the methods of this paper, literature [7], and literature [8]. It can be seen from Figure 2 that the matching ability of the method in this paper is consistent with the ideal matching degree and can complete the semantic fuzzy matching ability of all grammars. Compared with the other two methods, the semantic fuzzy matching ability is poor, and there is a certain gap with the ideal matching ability. In contrast, the effectiveness of this method is better.

7. Conclusion

With the development of the world economy, it has greatly promoted the development and growth of international trade and put forward higher requirements and standards for the translation of economic and trade English. Therefore, this paper proposes a study on the translation of international trade English phrases and grammar. With the help of rectangular window function, the composition principle of international trade English phrases is determined, the horizontal feature aggregation point method is introduced, the mathematical model of the phrase feature recognition is constructed, and the sparse matrix representation of the source phrase is constructed to complete the extraction and preprocessing of the phrase features. The proposed system converts the input international trade English sentence into the output English sentence, extracts the form and POS factors of international trade English semantic translation, and introduces lemma to obtain the surface form of language factors. According to the international trade grammar analysis method, this paper decomposes the translation model, decomposes English sentences into small phrases for translation, and completes the research on international trade English phrase and grammar translation. The experimental results show that this method has high accuracy in the feature extraction of international trade English phrases, and the translation error rate is low.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares no conflicts of interest.

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