

Construction of foreign translation and language communication system with Chinese characteristics based on multi-source information fusion

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ABSTRACT

In order to improve the translation accuracy and communication rate of Chinese characteristic language, this paper proposes a new method of constructing Chinese characteristic foreign translation and language communication system based on multi-source information fusion. Firstly, based on the method of multi-source information fusion, a corpus of Chinese characteristic foreign translation language is constructed. Secondly, it analyzes the language features of Chinese characteristic foreign translation, mainly including symbol features, resource features, subject features, problem features and value features. Finally, according to the construction principles of the characteristic foreign translation language communication system, the communication parameters are set to complete the translation language communication. The experimental results show that compared with the traditional methods, this method can accurately translate the Chinese characteristic language, and the propagation rate is significantly improved, and it is always stable at about 350ks/s.

Keywords: Multi source information fusion, Chinese characteristics, External translation, Language communication system

1. Introduction

Only in the dynamic communication process can the Chinese characteristic foreign translation language play the role of the most important communication tool in human society[1-3]. Language communication refers to "a speech activity that takes language as the information carrier and implements and completes human information communication through certain communication media or channels [4]. Different communication media or channels often have different deformation forms." Language communication is mainly composed of four elements: "communication subject,

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communication information [5], communication media and communication effect". The construction of language communication studies what is constructed through language symbols, the way of construction and the result of construction in the process of information communication of language communication.

The construction principle of the communication of Chinese characteristic foreign translation language refers to that the smooth development of the language communication activities requires the mutual cooperation of the language communication subjects, the communicators carry out the communication of information through the media [6], and the audiences interpret the information through the media. These principles have guiding significance for the development of language communication activities. On the one hand, language communication is affected and restricted by these principles, and on the other hand, following these principles can ensure the effectiveness of language communication to a certain extent.

Reference [7] proposes an English translation language propagation method based on particle swarm optimization neural network, which combines particle swarm optimization algorithm with neural network to improve the global search ability of English translation resources. The optimized neural network can learn and train the English translation resources, and analyze the English translation language communication with the trained data, which can improve the communication level of the translation language. Reference [8] proposes a translation language propagation method based on the fusion of CNN and Transformer. Aiming at the problems of low propagation efficiency and large parameters of translation language, this method adopts the structure of separation of computational attention module and normalization module to ensure the reusability of stacked multi-layer structure, improve the operation efficiency and reduce the computational parameters. The convolution calculation module and the original self attention module are introduced to fuse. The original self attention module is used to calculate the semantic relationship of global context translation, which reduces the complexity of translation language propagation. Reference [9] proposes a translation language propagation method based on re decoding, which takes translation resources as the context environment of language propagation and re decodes the translation language. During re decoding, the Transformer decoder blocks the attention of multiple heads and only blocks the current position words in the generated translation [10-13]. Therefore, re decoding can improve the reliability of translation language propagation.

On the basis of the above research results, in order to further strengthen the effectiveness of translation language communication, this paper puts forward a method of constructing a Chinese characteristic foreign translation language communication system based on multi-source information fusion.

2. Construction of translation corpus with Chinese characteristics based on multi-source information fusion

The calculation formula for keyword extraction [14] of Chinese characteristic translation corpus is:

$$C_value(a) = \begin{cases} \log_2 |a| f(a), & \text{if } H(A \cap B) \leq c \\ \log_2 |a| \left(f(a) - \frac{1}{p(T_a)} \sum_{b \in I_a} f(b) \right), & \text{else} \end{cases} \quad (1)$$

$$NC_{value((a))} = \alpha * C_{value(a)} + \beta * f_a(b) * \frac{f(b)}{p(T_a)}$$

where in:

$$\alpha + \beta = 1 \quad (2)$$

In the above formula, a represents the candidate word string, $|a|$ represents the word length, T_a represents the long keyword of the nested word string a , $p(T_a)$ represents the total number of terms of the nested word string T_a , and $f_a(b)$ represents the number of occurrences of the word string b in the context of the word string a .

In this study, five features are selected as the feature basis for keyword extraction in translation with Chinese characteristics.

1) Current part of speech: This study uses the stuttering word segmentation module to mark the part of speech.

2) The left information entropy of the current word is calculated as follows:

$$LE(w) = -\frac{1}{n} \sum_{a \in A} C(a, w) \log \frac{C(a, w)}{n} \quad (3)$$

In the formula, w represents the current word, A represents the set of words on the left side of w , and $C(a, w)$ represents the number of co-occurrence of word a and word w .

3) The right information entropy of the current word is the same as the left information entropy. The calculation formula is:

$$RE(w) = -\frac{1}{n} \sum_{a \in A} C(w, a) \log \frac{C(w, a)}{n} \quad (4)$$

In the formula, w represents the current word, B represents the set of words on the right side of w , and $C(w, a)$ represents the co-occurrence times of w and word a . The larger the information entropy, the greater the degree of fixity of the combination of left and right adjacent words.

4) Full text frequency of the current word: calculate the total number of occurrences of the current word in the foreign translation corpus.

5) Mutual information: the mutual information between the current word w and the word w' on the right. The calculation formula is:

$$M(w_1, w_2) = -\frac{p(w_1, w_2)}{p(w_1) * p(w_2)} \quad (5)$$

In the formula, $p(w)$ represents the probability of w appearing in the corpus.

According to the value range of eigenvalues, the left information entropy, right information entropy, word frequency and mutual information are discretized in 10 levels, so as to build a translation corpus with Chinese characteristics.

In order to improve the richness of the translation corpus with Chinese characteristics, TF * IDF statistical method is adopted to measure the importance of a translated word to the whole translation corpus. The specific calculation formula is:

$$W_j(d) = \frac{tf_j(d) \cdot \log(N/n_j)}{\sqrt{\sum_j (tf_j(d) \cdot \log(N/n_j))^2}} \quad (6)$$

In the formula, f_j represents the j -th candidate keyword, W_j represents the weight of the keyword f_j in the prediction database, $tf_j(d)$ represents the word frequency of the feature f_j in the prediction database, n_j represents the total number of translation LANGUAGES containing f_j in the corpus, and N represents the total number of translation languages in the prediction database. In order to ensure the accuracy of translation keyword extraction, this paper specifies the candidate keywords as verbs and nouns.

With its huge corpus combination, web network can provide continuously updated open corpus for language similarity calculation, so that the frequency, co-occurrence frequency and context information of translation language can be calculated more conveniently. In order to reduce the computational complexity, the similarity of breeding languages is calculated by four methods: Jaccard, Overlap, Dice and PMI. The specific calculation formula is:

$$Sim_{Web-Jaccard}(A, B) = \begin{cases} 0, if : H(A \cap B) \leq c \\ \frac{H(A \cap B)}{H(A) + H(B) - H(A \cap B)}, else \end{cases} \quad (7)$$

$$Sim_{Web-Overlap}(A, B) = \begin{cases} 0, if : H(A \cap B) \leq c \\ \frac{H(A \cap B)}{\min(H(A), H(B))}, else \end{cases} \quad (8)$$

$$Sim_{Web-Dice}(A, B) = \begin{cases} 0, if : H(A \cap B) \leq c \\ \frac{2H(A \cap B)}{H(A) + H(B)}, else \end{cases} \quad (9)$$

$$Sim_{Web-PMI}(A, B) = \begin{cases} 0, if : H(A \cap B) \leq c \\ \log_2 \left(\frac{\frac{2H(A \cap B)}{N}}{\frac{H(B)}{N} \times \frac{H(A)}{N}} \right), else \end{cases} \quad (10)$$

In the formula, A and B represent the translation terms to be retrieved, $A \cap B$ represents joint retrieval, $H(\cdot)$ represents the number of retrieval hits, and c represents the threshold of the number of retrieval hits, which is used to remove noise interference.

The final translation language similarity calculation formula can be written as:

$$Sim = a \times Sim_{Norm_Web-Dice}(A, B) + b \times Sim_{Norm_Web-Jaccard}(A, B) + c \times Sim_{Norm_Web-Overlap}(A, B) + d \times Sim_{Norm_Web-PMI}(A, B) \quad (11)$$

In the formula, a, b, c and d all represent the similarity weight [15], and $a + b + c + d = 1$.

The semi-structured hierarchical system is used to build the corpus of Chinese characteristic foreign translation language, and the unstructured UGC is used to extract the concept words of the characteristic translation language and calculate the similarity between the concept words. The concept hierarchical database system based on multi-source data fusion is shown in Figure 1.

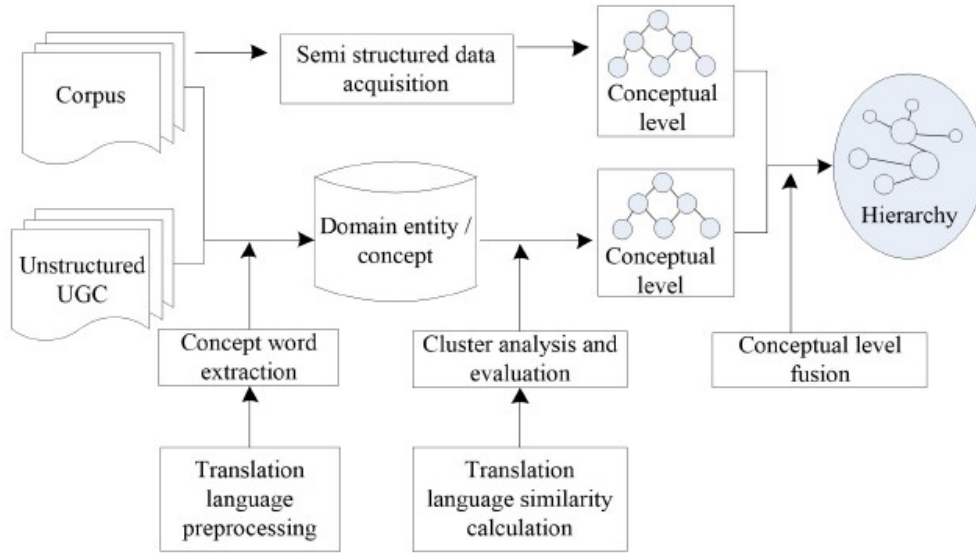


Fig. 1. Conceptual hierarchical database system based on multi-source data fusion

In order to improve the communication performance of Chinese characteristic translation languages, based on the constructed corpus, similarity propagation algorithm is adopted to classify the characteristic translation languages with high semantic similarity into one category.

The similarity propagation algorithm constructs an $N \times N$ similarity matrix S according to the similarity between the translated language data points, where $s(i, j)$ represents the similarity between the characteristic translation language data i and j . It should be noted that the matrix S can be symmetric, that is, $s(i, j) = s(j, i)$, or asymmetric, that is, $s(i, j) \neq s(j, i)$. The value $s(j, j)$ on the diagonal of the S matrix represents the possibility that the characteristic translation language data j can be used as the clustering center, and this value is also called the reference degree p (Preference). If all feature translation data are considered to have the same likelihood as the clustering center, the P value is constant. In addition, the size of P value will also affect the final number of clusters in the algorithm. If the average value of the input similarity is taken as the value of P , the number of clusters is medium; If a smaller value is taken, the number of clusters is smaller.

According to the similarity propagation algorithm, two types of information are transmitted between the characteristic translation language data points: the first is called Responsiveness, $r(i, k)$ reflects whether the characteristic translation original data point k can be the exemplar of the data point i ; The other is called Availability, $a(i, k)$ reflects whether the i band can select k as the cluster center. The specific calculation formula is:

$$r(i, k) = s(i, k) - \max_{k' \text{ s.t. } k' \neq k} \{a(i, k') + s(i, k')\} \quad (12)$$

$$a(i, k) = \min\{0, r(k, k)\} + \sum_{i' \text{ s.t. } i' \notin \{i, k\}} \max\{0, r(i', k)\} \quad (13)$$

In the initialization phase of the characteristic translation language database, the values of r and a are both 0. Iterate the above two formulas, and repeatedly update the Responsiveness and Availability of each translation language data until the iteration result remains unchanged or the algorithm execution exceeds the set number of iterations.

3. Foreign translation and language system construction with Chinese characteristics

3.1. *Language features of Chinese characteristics in foreign translation*

In the process of Chinese cultural communication, the translation of Chinese characteristic words has attracted much attention. Vocabulary with Chinese characteristics is a vocabulary that reflects the phenomena and things unique to China. The accuracy of the translation of vocabulary with Chinese characteristics will affect the correct understanding of China's politics, economy, culture and other aspects by the international community. How to translate words with Chinese characteristics in English is a problem that researchers have been exploring.

At the beginning of the 21st century, there have been studies on the translation of Chinese characteristic words, involving the theory of interpretation, functional equivalence, Skopos Theory and relevance theory; The texts analyzed include dictionaries, newspapers, magazines and government reports; The translation methods and Strategies of this kind of words are studied from various perspectives, including macro research, and some from specific text analysis; There are economic, political, cultural, people's livelihood, four character words and so on. Some choose political and economic words as research objects, and some take new words that appear in a certain period as research objects; In terms of translation methods, it involves the study of domestication and foreignization, and puts forward translation methods such as transliteration, literal translation, free translation, literal translation annotation and transliteration annotation. Translation is a complex process, involving not only the differences between Chinese and Western cultures, Chinese and English, but also the differences in values and thinking. It is biased to use a certain theory to explain the translation strategy of words with Chinese characteristics. Only by combining many theories and adopting different translation methods under different circumstances can a more suitable version be translated.

The international communication of Chinese discourse takes Chinese as the carrier or foreign language as the carrier. The audience that can be reached with Chinese as the carrier is very limited, and the audience that can be reached with foreign language as the carrier must be translated. Therefore, the construction of international communication discourse system depends on both high-quality discourse production and expressive discourse translation. Considering that international communication aims to achieve international recognition of national discourse, discourse translation should not only consider the transformation of language forms, but also consider the docking of cultural values. In other words, international communication should tell the Chinese story in a language that the international audience can understand and listen to. However, under the influence of the narrow "faithful translation view" based on the equivalence of language forms, translation practice often only pays attention to the equivalence of language forms and neglects the docking of cultural values, resulting in numerous mistranslations, misinterpretations and misunderstandings. Improper discourse translation has even caused great damage to the national image and international relations. The problem of language form transformation and cultural value docking in the process of discourse translation lies not only in the process of translation and introduction of Chinese discourse, but also in the process of translation and introduction. According to the law of translation and communication, it would be better if the work of translation from Chinese to Chinese is completed by the native speakers. However, in the current extensive discourse translation and introduction activities in the field, few native Chinese translators are familiar with Chinese and English bilinguals and their cultural backgrounds and can freely shuttle between the two. The direct result is that "meaning is derived from the text" or "meaning is taken out of context" in the introduction of discourse. Such misinterpretation or taking out of context does not only exist in the shallow level of misunderstanding and mistranslation (errors in surface language conversion), but also in the deeper level of misunderstanding and mistranslation

(separating the discourse from its deep cultural background). More importantly, when the translated discourse has taken root in China and added Chinese meaning, it flows into the international dialogue field again. The double variation of the signified level may be hidden behind the complete equivalence of the linguistic symbols at the signifier level, which makes the dialogue process like a chicken and a duck.

The fact that translation research has become an independent discipline does not mean that translation research is a prison, but is based on the fact that translation, as a complex social behavior, phenomenon or event, cannot be understood, explained and put forward corresponding solutions by any single discipline. In fact, during the long period when translation studies have not yet developed into an independent discipline, and during the nearly 40 years of efforts to develop into an independent discipline, translation studies have presented diversified theoretical perspectives under the promotion of different disciplines: linguistic translation studies, literary translation studies, cultural translation studies, historical translation studies, and sociological translation studies, in this pluralistic perspective, it is characterized by different theoretical forms: semiotic theory, information science theory, cultural theory, relationship conflict theory, functional theory, teleology, manipulation theory, system theory, etc. These theories take the study of translation as their commonness, showing three distinctive features: the research object, the theoretical hypothesis and the theoretical response made by time, place and people to the research object. Among them, the research object is the foundation, which involves the theoretical hypothesis and theoretical outlet. As far as the research object is concerned, there is no doubt that the factors involved in translation are extremely complex, and any problems related to translation can constitute the research object of translation studies. This undoubtedly leads to the generalization of translation studies, which is characterized by fragmentation on the one hand and superficialization on the other. The way to remedy these defects is to replace fragmentation and superficial research with systematic integrity research. The composition of any whole is a relatively independent system, and its independence is guaranteed by the mutual relations between the elements and parts of the system.

To understand the characteristics of philosophy and social science with Chinese characteristics, we should grasp three main aspects: first, to embody the inheritance and nationality; Second, it reflects the originality and the times; Third, it is systematic and professional. With regard to the study of Chinese characteristics in translation to foreign countries, this paper believes that we should at least have a understanding and grasp of the following five aspects:

The first is the characteristics of symbols. No matter how much people emphasize the cultural, social and subjective nature of translation, in my opinion, the fundamental problem of translation should still be implemented in the language symbols. The so-called "symbolic features" here include two aspects: one is the symbols involved in translation, that is, the symbols of translation practice, including the original symbols and the target symbols; the other is the academic symbols of translation studies, that is, the theoretical discourse symbols. If we regard translation narrowly as communication between different languages, then the symbols involved in translation are mainly language. As far as the languages involved in translation are concerned, no matter whether the Chinese language is used to translate other languages or the Chinese language is used to translate the Chinese language, it can not circumvent the practical problem of the particularity of the Chinese language. Besides the characteristics of ancient Chinese, modern Chinese and Chinese dialects, we also have the characteristics of language symbols of other nationalities, such as Mongolian, Tibetan and Uyghur. Many of these ethnic minority cultural classics are translated into foreign languages after being translated into Chinese. The multi-ethnic nature of Chinese language and the historical nature of social culture undoubtedly constitute an important topic in the study of translation with Chinese characteristics. No matter whether we discuss the translation from Chinese to foreign or the translation of Chinese national culture, we can not but give full consideration to these problems. The

problem of academic discourse in translation theory lies in the semiotic features of discourse expression in the theory and practice of translation studies.

The second is the characteristics of resources. Traditionally, when people talk about the resource characteristics of translation studies with Chinese characteristics, they tend to pay attention to the inherent traditional Chinese ideological and cultural resources, but consciously or unconsciously ignore the relationship between the development of modern Chinese Humanities and Social Sciences and Western foreign theories and ideas. Chinese traditional culture is rich in translation theory and thought resources, and Chinese characteristics of foreign translation research is certainly rooted in Chinese traditional culture. However, if we only blindly emphasize the mining of translation theory and practice resources from Chinese traditional culture, it will obviously break the tradition of Chinese translation research and cannot truly highlight the resource characteristics of Chinese translation research. China is a part of the world. To learn from, integrate and absorb foreign translation theories and ideas is not an indispensable external condition for the development of foreign translation studies with Chinese characteristics, but an indispensable internal demand.

Third, the main characteristics. At present, there are a large number of subjects participating in translation studies in China, which undoubtedly constitute incomparable characteristics of other countries, but this is not enough to highlight the characteristics of China's foreign translation studies. Based on the research position, research purport and ideological background, Chinese translation scholars have shown their thinking perspective, theoretical character and practical consciousness in translation studies, that is, the subjectivity of foreign translation studies with Chinese characteristics, these are the key factors that constitute the foreign translation with Chinese characteristics, which at least include: 1) the subjective consciousness of the constantly changing Chinese translation practice; 2) The subjective consciousness of the theory and method of analyzing Chinese translation practice; 3) The subject consciousness of the responsibility of China Translation Research Institute.

Fourth, the characteristics of the problem. Research originates from problems, and the quality of problems determines the value of research. Sticking to the problem orientation should be the distinctive feature of constructing the academic system and discourse system of foreign translation studies with Chinese characteristics. China's translation studies and China's applied translation studies should be based on solving China's own problems. Having a global mind and a broad view of the world are inseparable from the premise of reality. Based on the actual situation of translation in China, there are naturally many problems with Chinese characteristics in Chinese translation studies. Looking back on the applied translation studies in China, we can find that the Chinese translation of Buddhist scriptures since the Han Dynasty began with the Chinese translation of the Bible in the Tang Dynasty, the scientific and technological translation in the late Ming and early Qing Dynasties, the social science translation in the "May 4th period", the legal translation, business translation and the translation of classics since the modern times, and the translation of foreign publicity, political discourse, Diplomatic Discourse and military discourse after the founding of new China, to a great extent, they have practiced the Chinese characteristics of applied translation studies, that is, translation studies that are relevant to China and have unique perspectives or resources in China.

Fifth, value characteristics. The so-called value is a special relationship between the subject and the object. The existence of Chinese translation studies or applied translation studies is closely related to their presupposition value, which is different from other disciplines and has its own theoretical and practical characteristics. It can even be said that the foundation of translation studies lies in the establishment of translation values and the positioning of translation. Generally speaking, translation value can be divided into translation practice value and translation academic research value. It should be recognized that the translation practice value is universal to some extent, but it can not be denied that it also contains the translation practice value characteristics of the

construction of socialism with Chinese characteristics, such as the Chinese translation project serving the development strategy of Chinese culture going out, the social value of the language translation practice serving the countries along the "the Belt and Road" initiative, and the language value of enriching China's language resources.

3.2. *Communication system of Chinese characteristic foreign translation language*

3.2.1. Construction principles of communication system:

1) Normative principle. The standardization of language communication refers to that language communication needs to conform to the established language expression in the society in which it is constructed, which is specifically manifested in the harmony of phonetic rhythm and rhythm, the accuracy and appropriateness of vocabulary use, and the standardization of grammar. "While disseminating information to the public, the media are also disseminating language and language norms to society." Only with the use of standardized language can the information be transmitted with maximum effectiveness and be better understood and accepted by the audience.

2) Accuracy principle. The accuracy of language communication is a higher-level requirement for language meaning based on the standardization of the use of various elements in the process of language communication. The standardization of various elements of language ensures the correctness of language meaning, while the accuracy of language ensures the accuracy of semantics. In order to enable the communicators and the audience to maximize the effectiveness of language in the transmission and reception of language information, and to mine the meaning of language, language communicators are required to use accurate words and sentences.

3) Understandability principle. Language communication is a kind of communication activity that takes language as the carrier of information. It is a process of information transmission and communication. In this process, the communicators have a certain purpose, consciously exert influence on the audience, and the audience will react to the transmitted information. The communication interaction between the communicators and the audience is more obvious on the new media platform.

3.2.2. Construction of communication system. The three-tier architecture of the typical Model-View-Controller Model 2 is used to design the architecture of foreign translation language dissemination with Chinese characteristics. This design method divides the propagation system into view layer, control layer and model layer. In the architecture designed this time, the model layer is subdivided into a business layer and a persistence layer. Figure 2 shows the architecture of language dissemination for foreign translation with Chinese characteristics.

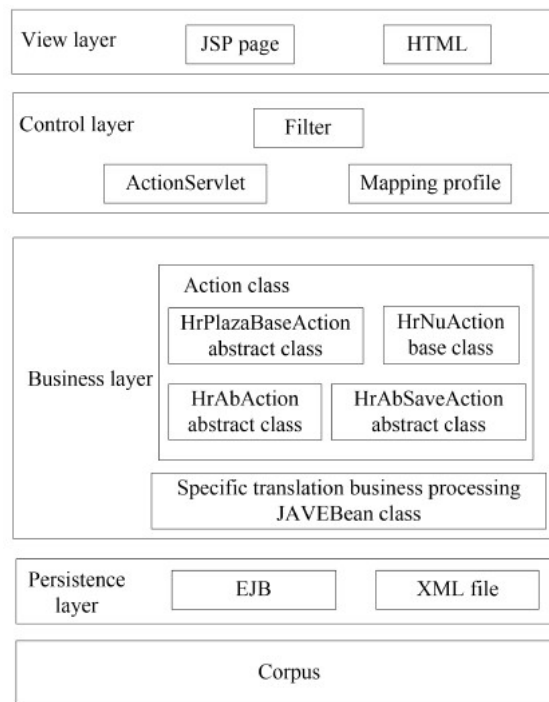


Fig. 2. Communication system structure of translation language with Chinese characteristics

The above-mentioned system design completes the construction of the corpus database, and on this basis, carries out the research on the communication of Chinese characteristic foreign translation language. Under the constraint of limit learning machine [16-18], a fuzzy membership function of information resources fusion of Chinese characteristic foreign translation language is constructed. The expression of this function is:

$$P_F = \sum_{j=k}^N \sum_{ft} \prod_{i=1}^N (P_{ft})^i (1 - P_{di}) \quad (14)$$

In the formula, $j = k$ represents the data analysis of the characteristic foreign translation resources managed by the module, $i = 1$ represents the big data sharing system of the characteristic foreign translation language information, P_{ft} represents the big data distribution and fusion cluster center of the characteristic foreign translation resources [19], P_{di} represents the sampling frequency of the characteristic foreign translation language information resources, and N represents the total number of sampling. The data set of the characteristic foreign translation language sampling structure can be expressed as:

$$\bar{x} = \frac{1}{N} \sum_{i=1}^N |x_i| \quad (15)$$

In the formula, x_i represents the sampling result of the characteristic foreign translation language information resources.

In the data fusion center for the dissemination of Chinese characteristic foreign translation language, the data attribute set of language is constructed, and the root mean square error of classification and dissemination of language data is obtained as follows:

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^N |x_i - x_{i1}|^2 \quad (16)$$

$$x_{i'} = \frac{x_i}{\|x_i\|} = \left(\frac{x_{i1}}{\|x_i\|}, \frac{x_{i2}}{\|x_i\|}, \dots, \frac{x_{iN}}{\|x_i\|} \right) \quad (17)$$

In the formula, x_{iN} represents the linear regression result of the characteristic foreign translation language information resources.

On this basis, the fuzzy x_{i2} - means clustering method is adopted to cluster the characteristic foreign translation resources, and the output feature quantity after data clustering is obtained as follows:

$$Xp(u) = s_c(t)e^{j2\pi f_0 t} = (x_{i'})e^{j2\pi(f_0 + Kt^2)/2} \quad (18)$$

In the formula, $s_c(t)$ represents the scalar time series [20], $e^{j2\pi f_0 t}$ represents the feature matching set of feature foreign translation information fusion, and Kt^2 represents the reference frequency component.

In order to ensure the orderly process of the characteristic foreign translation language communication system, the language communication path is calculated:

$$s = \frac{c}{|k(a)||k(b)|} \sum_{j \in k(b)} \sum_{i \in k(a)} s(i, j) \quad (19)$$

In the formula, $k(a)$ represents the set of propagation nodes, $k(b)$ represents the propagation call node, and c represents the damping coefficient of propagation.

According to the language propagation path value calculated by formula (19), the propagation parameters are set to form a calculation formula for language propagation:

$$c_{i,j} = \sum c_{j-1,n} h_{n-2k} \quad (20)$$

In the formula, $c_{j-1,n}$ represents the scale coefficient of propagation distribution, h represents the number of layers of propagation path distribution, and n and k represent the ordered propagation parameters.

4. Experimental verification

In order to verify the effectiveness of the proposed method of constructing the communication system of Chinese characteristic foreign translation language based on multi-source information fusion, the performance of the method is verified.

The foreign translation language data of this study is from the standardized technical language library of Chinese characteristic discourse translation, and 20GB of foreign translation data are collected from this database for this experiment. Since the data is directly collected from professional data, it does not need to be de-noising or past processing, and can be directly used in experiments.

In order to fully verify the performance of the proposed method, the comparative experimental scheme is set as follows: Taking the multi-source information fusion efficiency of the translation language, the accuracy of the Chinese characteristic foreign translation language, and the propagation rate of the Chinese characteristic foreign translation language as the experimental comparison indicators, the method in this paper is compared with the methods in reference [7] and reference [8].

4.1. The efficiency of multi-source information fusion in Chinese characteristic foreign language translation

Through the multi-source integration of the translation language, the reliability of the communication of the foreign translation language with Chinese characteristics can be improved, and a more coherent foreign translation sentence can be formed, which can better improve the comprehensibility of the foreign translation language, and thus help to improve the effect of the communication of the foreign translation language. With the increasing demand for foreign translation languages, higher requirements are put forward for the efficiency of multi-source integration of translation languages. Compare the information fusion efficiency of the three methods, as shown in Figure 3.

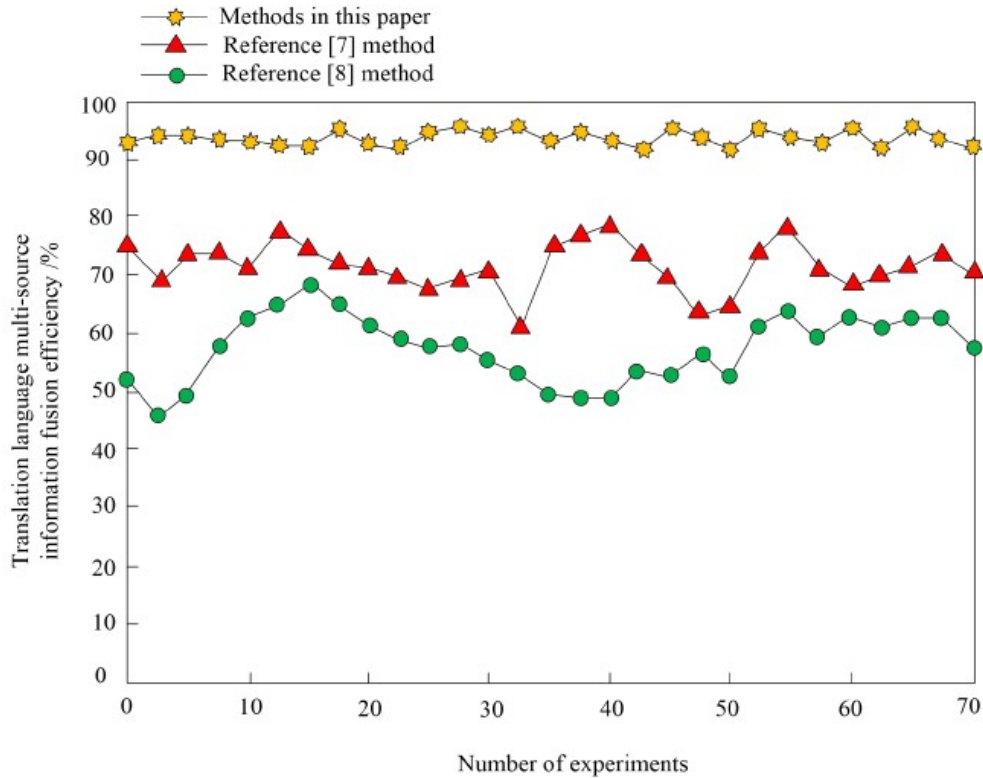


Fig. 3. Efficiency of multi-source information fusion of Chinese characteristic foreign translation language

The comparison of multi-source information fusion efficiency for Chinese characteristic foreign translation languages, as shown in Fig. 3, reveals that the fusion efficiency of this method consistently outperforms the two comparison methods from the literature across numerous experiments. The fusion efficiency of this method remains above 92%, reaching as high as 97%. In contrast, the fusion efficiency of the two literature-based methods not only fluctuates significantly but also remains relatively low, with the highest value reaching only around 80%.

4.2. The accuracy of Chinese characteristic foreign translation language

Due to the characteristics of the Chinese language, there is a high degree of professionalism in the process of foreign translation. Only when the translation accuracy of proprietary words or proprietary sentences is met can the communication quality of the translated language be ensured. Therefore, the accuracy of the translated language with Chinese characteristics is compared and verified. The translation accuracy comparison results of the three methods are shown in Fig. 4.

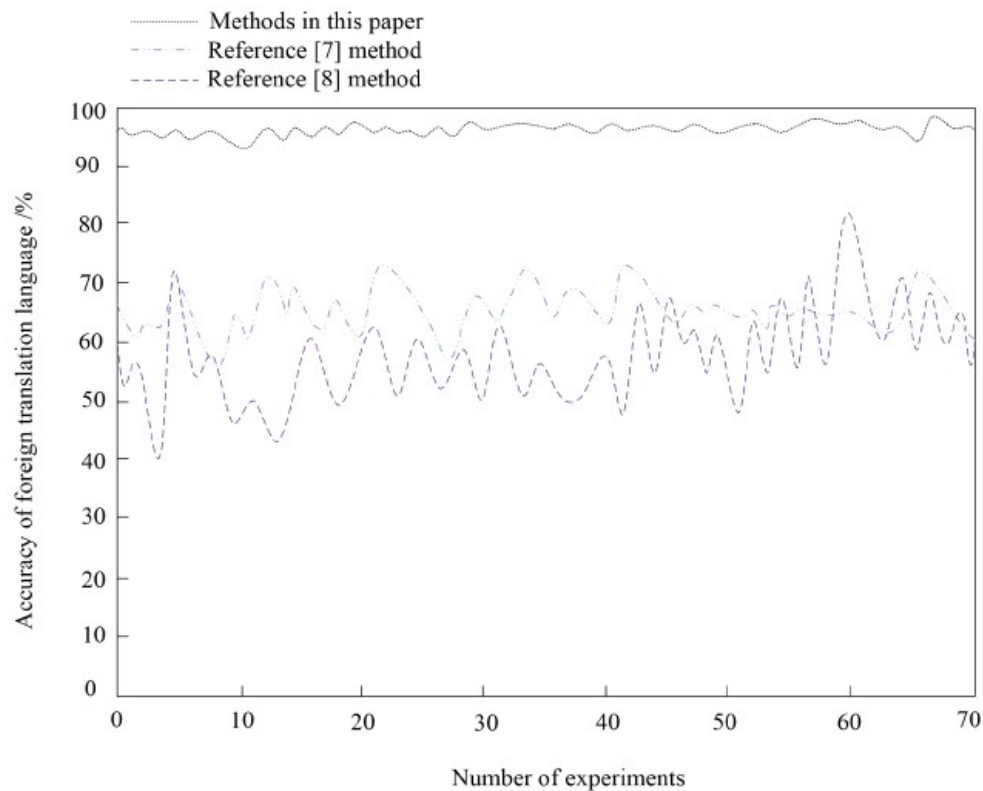


Fig. 4. Accuracy of Chinese characteristic foreign translation language

It can be seen from the accuracy results of Chinese characteristic foreign language translation shown in Figure 4 that the method in this paper can accurately translate Chinese characteristic language, with the highest translation accuracy of 99%. Therefore, it fully shows that the proposed method can accurately translate the Chinese characteristic language and ensure the communication quality of the translated language.

4.3. The spread rate of Chinese characteristic foreign translation language

According to the above experimental results and based on the experimental preparation, test the language propagation rate results of the three methods, record and summarize the throughput of the three language propagation methods at different times, calculate the throughput efficiency at different times, and draw the translation language propagation efficiency result chart as shown in Fig. 5.

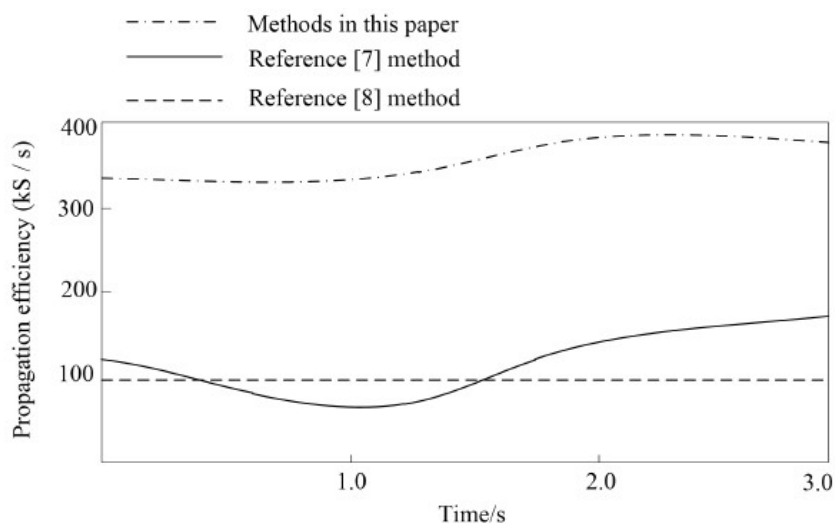


Fig. 5. Spread rate of Chinese characteristic foreign translation language

It can be seen from the propagation rate experiment results of the propagation system shown in Fig. 5 that, at different times, the propagation rate of the methods of reference [8] and reference [8] is about 100kS/s, the propagation rate value is small, and the time is about 1.0s. There is a change in the direction of a small rate value, which can not better adapt to the requirements of foreign translation language propagation and is not practical. The propagation rate of the method in reference [7] is unstable at different times. The average propagation rate is about 150kS/s, and the rate with large value and large fluctuation will cause the propagation system to be unstable, resulting in the occurrence of stumbling in the process of translation language propagation. However, the propagation rate of the translation language in this method is about 350kS/s, and the propagation rate is the largest. In the actual application process, there is a large rate change direction, which can better spread the foreign translation language with large memory and has stronger practicability.

5. Conclusion

It must be acknowledged that talking about applied translation research with Chinese characteristics does not mean to create a discourse system of applied translation research limited to ontology and pure theoretical knowledge, but rather to understand the rationality and legitimacy of applied translation research with Chinese characteristics based on the theoretical and practical resources of Chinese traditional applied translation research, learn from the academic discourse introduced since modern times, and then make due contributions to the integrity of translation studies and other disciplines in the world. Therefore, the concept of applied translation research with Chinese characteristics expresses the traditional perspective and developmental concept of applied translation research and translation research. In order to improve the quality and efficiency of the communication service of Chinese characteristic foreign translation language, this study proposes a new communication system of Chinese characteristic foreign translation language based on multi-source information fusion, which realizes the efficient communication of translation language, and verifies the performance of the communication system construction method, which can further promote the communication of Chinese characteristic foreign translation language in practice.

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