

## *Retraction*

# **Retracted: Recognition of English Vocabulary and Speech Corpus Based on Computer Image Processing**

### **Wireless Communications and Mobile Computing**

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

- (1) Discrepancies in scope
- (2) Discrepancies in the description of the research reported
- (3) Discrepancies between the availability of data and the research described
- (4) Inappropriate citations
- (5) Incoherent, meaningless and/or irrelevant content included in the article
- (6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

### **References**

- [1] X. Sun, "Recognition of English Vocabulary and Speech Corpus Based on Computer Image Processing," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 3992955, 7 pages, 2022.

## Research Article

# Recognition of English Vocabulary and Speech Corpus Based on Computer Image Processing

Xiaohong Sun 

Functional Department of Shijiazhuang Information Engineering Vocational College, Shijiazhuang, Hebei 052100, China

Correspondence should be addressed to Xiaohong Sun; 20160669@ayit.edu.cn

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In order to solve the problem that the function and performance of traditional systems in English machine translation cannot meet the needs of intelligence, the author proposes an English vocabulary and speech corpus recognition system based on computer image processing. On the basis of designing the overall structure of the system, the hardware structure is designed by designing the server and translator. In the software design, the semantic features of the input English sentences in human-computer interaction are analyzed by using the enhanced algorithm, the decoding algorithm is designed according to the analysis results, and the English machine translation model is constructed. Experimental results show that when the number of sentences translated by this system is from 100 to 1000, the BLEU indicator keeps rising from 7 to 10. The English vocabulary and speech corpus recognition system based on computer image processing is more efficient.

## 1. Introduction

With the continuous development of network informatization in recent years, computer technology is gradually applied in various industries. The content of the computer is very broad, and the most widely used is the image recognition technology. Image recognition technology requires that the processing computer has a high configuration, the speed of the computer must meet certain requirements, and it has a large storage space. With the continuous development of network informatization, computer image recognition technology has become more and more widely used, from the initial simple image processing to the current intelligent recognition processing. Nowadays, computer image recognition technology mainly recognizes characters and numbers and can currently recognize three-dimensional images of objects. In the 1950s, computer image recognition was still in digital and word processing; in the late 1960s, people gradually had other ideas for information recognition. On this basis, using computer intelligent processing technology, complex images can be processed. Since the 1970s, the technology of the computer industry has been

continuously optimized and reformed and the processing of image recognition technology has developed in a more advanced direction. People have begun to study how to use computers to express the meaning of images and have achieved important results in practical applications. Among them, the most worth mentioning is the vision concept of foreign scholars, which has become the central idea of the computer for more than ten years. In the 1980s, people began to apply image recognition technology to geographic systems to study the automatic generation of massive images. The real development of image recognition processing technology was in the 1990s, and the real leap forward is in the 21st century. At this time, image recognition technology has been widely used and valued in many industries and fields, including medical industry, military industry, and agriculture [1, 2].

## 2. Literature Review

With the development trend of world integration, the exchanges between countries have become increasingly close and the academic circle has covered all countries in the world.

As a common academic language, English translation quality determines the transmission efficiency of academic ideas and achievements. Traditional pure human translation is too expensive and inefficient to meet the growing demand for translation. In addition, in the era of the Internet of everything, with the vigorous development of artificial intelligence and big data, computer translation has become an inevitable trend of development and it is also a breakthrough for improving translation efficiency. To this end, people put forward new requirements for the current auxiliary translation system [3, 4].

The original intention of people designing machine translation systems is to break the barriers of language communication; in the early days of the computer, its core design idea was to use the speed of computer operations and powerful storage functions to help translators complete complicated translation work, so as to achieve perfect conversion between languages. After the computer is widely used, scientists hope to use the computer to help people break the language barrier; therefore, the machine translation system was born. Nowadays, with the development of economic globalization, the communication and exchanges between people in various countries are becoming more and more close and economic exchanges are becoming more and more frequent and the demand for translation work is gradually increasing, the efficiency is very low, and it is also restricted by the quantity and quality of translation practitioners [5, 6]. Therefore, according to the current situation of economic globalization, an English machine translation system is designed, which frees translators from complicated translation work and engages in more creative and personal hobbies; using the English machine translation system is not only low cost, and the work quality and efficiency are greatly improved. In order to improve the efficiency of real-time sign language recognition, Yang et al. proposed an embedded recognition system based on the STM32 chip; through dual-axis sensors, 3 muscles and 6-channel MMG of the human hand were collected; the characteristics of the STM32 chip, combined with the neural network algorithm, build the embedded recognition system model and import the parameters into the model to realize the transplantation of the algorithm. Experimental results show that the embedded recognition system can realize real-time recognition of more than 50 sign languages, the recognition rate of the model is as high as 99%, and the real-time recognition efficiency can also reach more than 97.6%; the classification time of each action is controlled within 0.55 ms, poor functionality [7]. Navarro et al. proposed a sparse word recognition system using a variety of decoding strategies, using the transformer model to decode and process a variety of data information, reconstruct the words through the encoding program, and identify the translated sentences according to the basic principle of data fusion; the sparse words can greatly improve the efficiency of the translation, but the translation performance is poor [8].

Based on the abovementioned research background, an English machine translation system is designed by using the human-computer interaction enhancement algorithm, so as to meet the functional and performance design requirements of the system.

### 3. Methods

#### 3.1. System Hardware Design

*3.1.1. Overall System Architecture Design.* The overall structure of the English machine translation system is mainly divided into the online translation module, dialogue module, English dictionary module, and conversion module. The overall architecture of the system is shown in Figure 1.

The overall architecture diagram of the English machine translation system is mainly divided into two parts, one is the server and the other is the client [9]. Among them, the server is mainly used to complete the conversion process of the English online translation system. The client is a client terminal app, which can also be regarded as a translator, mainly including a Chinese-English translation module, an English dictionary module, and a dialogue module. The architecture of the entire system adopts the CS architecture model to provide customers with real-time and efficient English translation services.

*3.1.2. Translation Server Design.* The translation server is mainly composed of multiple translation programs, and the process of Chinese-English translation is realized through the web server equipped with Apache. Different translation servers correspond to translation work between different languages; the author's English machine translation server is a distributed English machine translation system built to serve Chinese-to-English translation tasks. The core setting of the English machine translation server is the web server, which manages the client access port through the web server. By building a translation server and a web server to run an English translation server, users can access and query on the client side through the Internet protocol port provided by the web server [10, 11]. The web system in the English machine translation server is a complete web server system, which is mainly developed and designed through PHP, and online English translation is performed through the web server, the multifunctional requirements of the terminal [12].

*3.1.3. Translator Design.* The construction process of the English machine translator is mainly divided into two steps: The first is the training step. After inputting the source language using human-computer interaction technology, the Chinese-English translation data needed to calculate the high probability is selected from the massive English thesaurus. The second is the decoding step; according to the maximum training data of the high-probability Chinese-English translation data obtained by training, the initial training data is obtained by counting sentences and phrases in the English thesaurus; the decoding process is then used to find the optimal translation result in a large amount of training data. The design principle of the English machine translator is shown in Figure 2.

Through the design of the English machine translation server and translator, the hardware structure of the system is designed.

#### 3.2. System Software Design

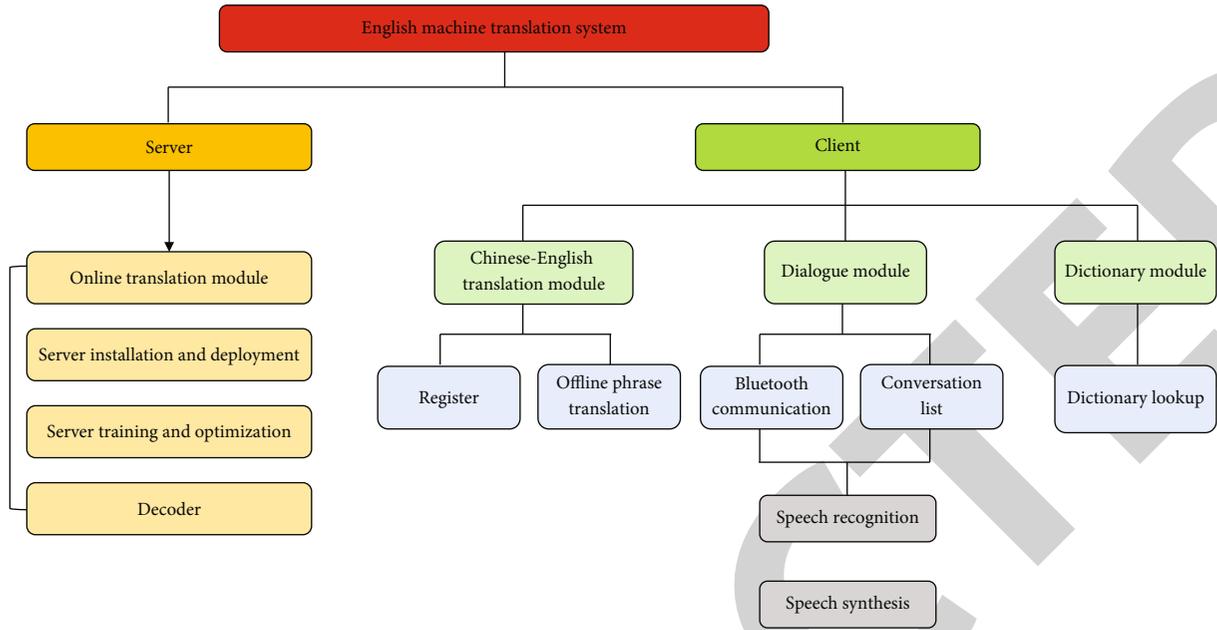


FIGURE 1: Overall architecture diagram of the English machine translation system.

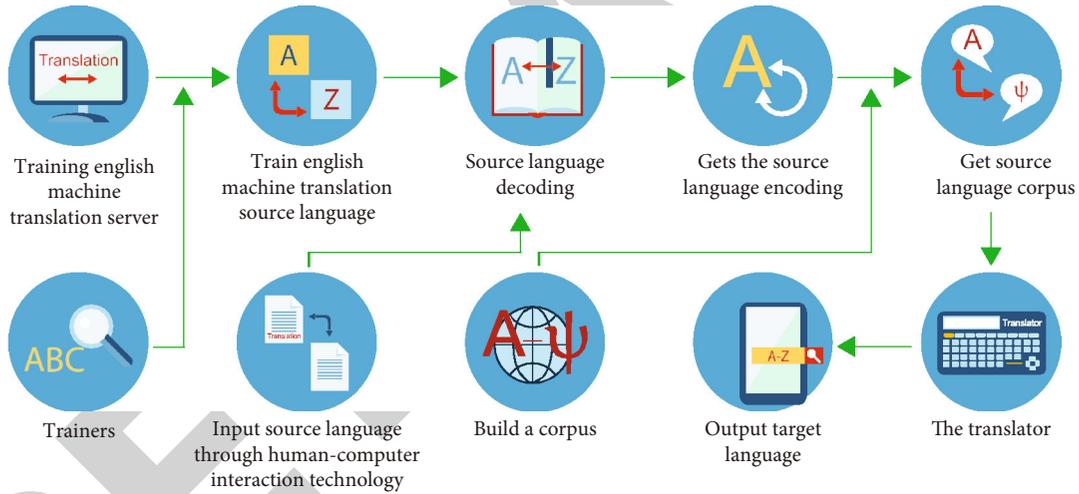


FIGURE 2: The working principle of the English machine translator.

3.2.1. *Analysis of Semantic Features of English Machine Translation.* In the client of the overall architecture of the English machine translation system, the English sentences to be translated are obtained by using human-computer interaction technology. On this basis, the enhancement algorithm is used to analyze the semantic features of English sentences [13–15]. The text to be translated is input into the deep structured semantic model, and the mapping of the sentence is completed in the input layer of the model to form a space vector. Then, after the word vector is obtained, it is input into the representation layer of the model and processed by weighted average; the processing steps are as follows:

Step 1. Pooling layer vector calculation.

$$P = W_1 W_2. \quad (1)$$

In formula (1),  $W_1$  and  $W_2$  represent word vectors of two different dimensions, wherein the dimension of  $W_1$  is  $n \times m$ , and the dimension of  $W_2$  is  $1 \times m$ . After processing by the pooling layer, a sentence vector can be obtained, that is,  $1 \times m$ . If  $\omega_i$  is defined to represent the weight matrix, corresponding to the  $i$ th layer of the model and the bias term of the  $i$ th layer is represented by  $b_i$ , the calculation formula of the hidden layer of the model is as follows:

$$H_i = \omega_i P + b_i. \quad (2)$$

From this, the output result of the semantic feature matching layer of the text to be translated can be obtained as follows:

$$T = \omega_n P_{n-1} + b_n. \quad (3)$$

The  $T$  obtained in formula (3) is the semantic feature of the text to be translated after the enhancement processing.

Based on this, on the basis of extracting the English text information in the information source, the semantic similarity of English machine translation phrases  $M$  and  $N$  is obtained as follows:

$$\text{Sim}(M, N) = \text{Cos}(M, N) = \frac{D(M) \cdot D(N)}{|D(M)| \cdot |D(N)|}. \quad (4)$$

Through the semantic structure reconstruction method, the analysis of the ontology structure of English machine translation is realized and the English semantic mapping definition  $D$  is obtained; the similarity between the word information and the semantic type of the English machine translation system is described as follows:

$$t_{x,y}(u) = \frac{p_{x,y}(u) - sp_{x,y}(u)}{p_{x,y}(u)}. \quad (5)$$

The English machine translation word matrix  $T_w$  and the similarity English translation semantic matrix  $T_B$  are solved, and calculation formulas (6) and (7), respectively, are as follows:

$$T_w = \sum_{x=1}^K \sum_{y=1}^{K_i} (\beta_{xy} - \beta) (\beta_{xy} - \beta)^K, \quad (6)$$

$$T_B = \sum_{x=1}^K (\beta - \beta_{xy}) (\beta - \beta_{xy})^k. \quad (7)$$

The optimal context of the semantic relevance matrix  $T_w$  and  $T_B$  is described as  $\gamma, f$  is used to measure the contextual relevance between semantics, and  $\beta$  represents the semantic mapping process [16].

Through the abovementioned solution results, the semantic features of English machine translation are obtained and relevant evaluations are obtained by performing irregular analysis on them. Assume that the semantic evaluation set of the English machine translation system is  $\beta \in [0, T)$ , the number of two ontology label evaluation sets  $S$  satisfying the rule vector is  $k$ , and then, the semantic feature vector  $\beta$  of the English machine translation system can be expressed by formula (8) as follows:

$$\Delta(\beta) = \begin{cases} t_k, K = \text{round}(\beta), \\ b_i = \beta - k, b_k \in [-0.5, 0.5). \end{cases} \quad (8)$$

Among them, round is the semantic feature attribute set of English machine translation, which is used to describe the BinarySplits vector, realizes the screening and analysis of semantic features through the mapping method of semantic features, constructs the English translation database, and realizes the analysis of the semantic features of English machine translation combined with the subject headings.

**3.2.2. Design Decoding Algorithms.** English machine translation decoding is a decoding calculation process for all known parts of the English vocabulary that need to be translated. According to the current state  $t_j$  of the English machine translation decoder, the conditional probability of the  $j$ th English translation target word can be obtained; calculation formula (9) is as follows:

$$Q(z_j | z_{j-1}, y) = h(t_j). \quad (9)$$

In formula (9),  $h$  is the nonlinear function of English machine translation and  $t_j$  is expressed by the following formula:

$$t_j = g(z_{j-1}, t_{j-1}). \quad (10)$$

Through the human-computer interaction enhancement algorithm, the known English machine translation decoding target vocabulary is the output and the translation output is obtained. The flow chart of the English machine translation decoding algorithm is shown in Figure 3. According to the abovementioned process, an English machine translation decoding algorithm is designed.

**3.2.3. Building an English Machine Translation Model.** According to the above-designed English translation machine server, the information source text is collected and the neural network is used to convert the vector. Then, information source input text expression (11) of English machine translation is obtained as follows:

$$Y = \{y_1, y_2, y_3, \dots, y_n\}. \quad (11)$$

Among them, the number of words in English machine translation is  $n$ ; in the initial stage of translation, the translator translates all words  $y_i (i \in n)$  of the information source text information and obtains the corresponding English phrase links, such as formula (12) as follows:

$$E_{ij} = \frac{S_*}{E_\kappa} \cdot (U \times U_i)j. \quad (12)$$

Among them,  $S_*$  represents the basic criteria of English machine translation and  $E_\kappa$  represents the semantic feature module.  $U$  represents the information source word set,  $U_i$  represents the segmented information source words, and  $j$  represents the Chinese-translated phrase sequence.

The main semantic role of English machine translation is defined as  $\varphi(t)$ , and the translation of the English phrase set is selected, such as formula (13) as follows:

$$T_{aw} = \frac{r_i \cdot \varphi(t)}{q(o)} \times \text{SC}(o). \quad (13)$$

In the abovementioned formula,  $r_i$  represents the word modifier of English machine translation,  $\text{SC}(o)$  represents the number of semantic blocks of English machine

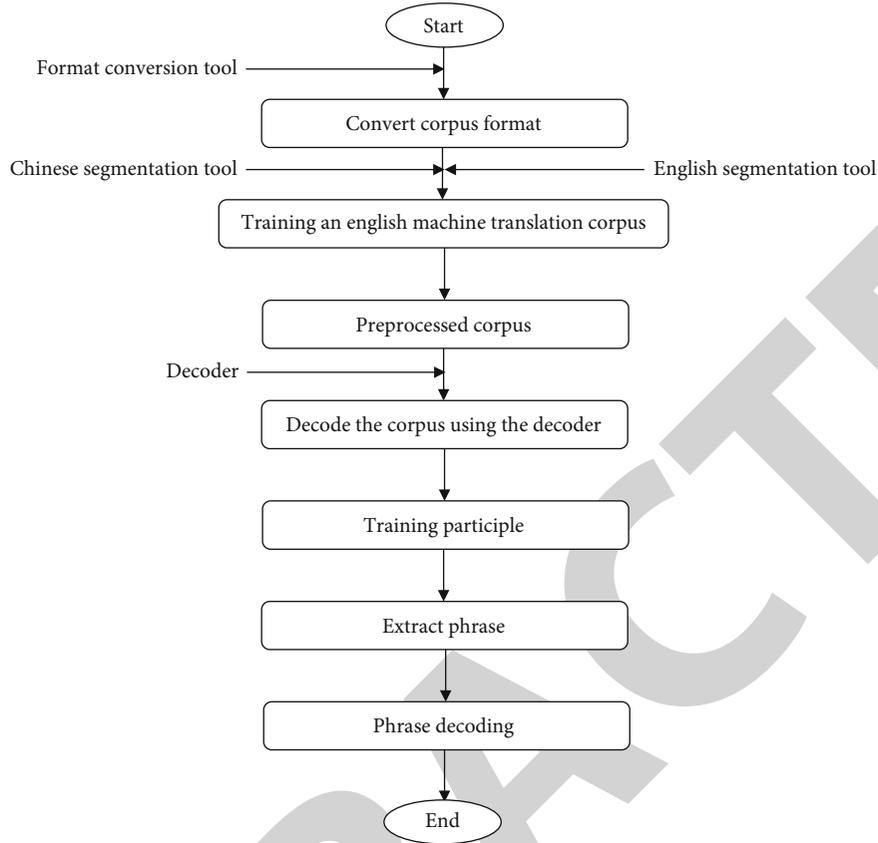


FIGURE 3: Flowchart of the English machine translation decoding algorithm.

translation, and  $q(o)$  represents the recognized prepositional phrase.

Suppose,  $nf$  represents the word frequency of English machine translation, which is mainly used to express the number of occurrences of words in the process of English machine translation, and  $idf$  represents the frequency of document translation; formula (14) can be used to obtain the feature weight function of English machine translation:

$$\text{Weight}_{nfidf(t)} = \frac{nf(t) \times idf(t)}{f_i(n)}. \quad (14)$$

The gain information value of English machine translation text information is obtained by formula (15), namely,

$$G(Y, z) = \frac{H(Y) - H(Y|z)}{idf(t)}. \quad (15)$$

In formula (15),  $H(Y)$  represents the text information of English machine translation and  $H(Y|z)$  represents the gain relationship between each information group in the information source.

Defining the semantic features in the English translation process as  $\mathcal{Y}^v$ , formula (16) can be used to complete the con-

struction of the English machine translation model, namely,

$$WF_y = \frac{\mathcal{Y}^v \cdot I(F) \cdot S}{\psi^*} \bar{F}_y \bar{\omega}. \quad (16)$$

In formula (16),  $\bar{\omega}$  represents the redundancy of English translation,  $I$  represents any entry in the English machine translation dictionary, and  $\psi^*$  represents the value of the translation entry under different grammatical conditions. To sum up, by designing the English machine translation decoding algorithm, the English machine translation model is constructed and the system software design is realized.

**3.3. System Test.** In order to verify the practical application effect of the English machine translation system based on the above-designed human-computer interaction enhancement algorithm, the following test process is designed [19, 20].

**3.3.1. Test Processing.** The system test dataset comes from the Chinese-English parallel corpus in the United Nations Corpus, from which 100000 sentences are randomly selected as the training corpus and 11000 sentences are randomly selected as the test corpus. The relevant information of the test corpus is shown in Table 1.

The human-computer interaction enhancement algorithm is used to process the corpus as follows:

TABLE 1: Relevant information of the test corpus.

	Training set	Test set
Number of sentences	100000 sentences	1000 sentences
Average length of sentences in the source language	18.46	28.17
Average length of target language	25.35	32.94
The vocabulary size of the source language	47583	2382
The vocabulary size of the target language	29784	3168

TABLE 2: Parameter settings.

Parameter name	Parameter value
Word vector dimension	800
Source language vocabulary	6000
The number of target language vocabulary	5000
The number of human-computer interaction nodes	2048
Number of sentence frames	12
Human-computer interaction frequency	1200 Hz

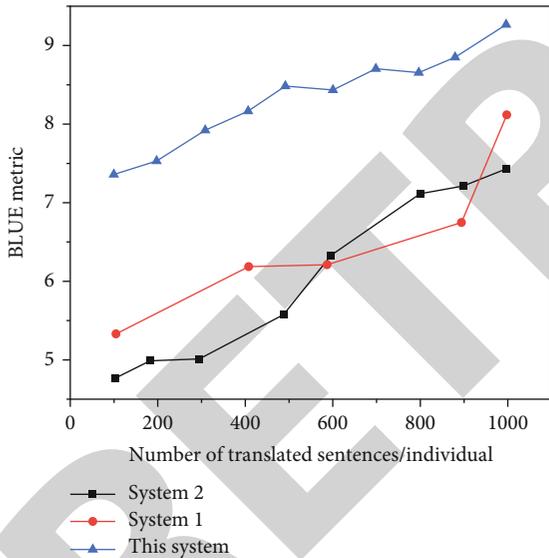


FIGURE 4: BLEU indicator test results of different systems.

- (Step 1) On the basis of the divide and conquer method based on the neural network, use the human-computer interaction enhancement algorithm to analyze the phrase structure of Chinese sentences with a length greater than 15
- (Step 2) For the implementation method of multisequence encoding, use language technology platform tools to perform word segmentation processing on Chinese sentences in the corpus and mark the part of speech and dependency analysis of Chinese sentences [17]

(Step 3) According to the analysis results of the phrase structure of the Chinese sentences, extract the part-of-speech sequence and the hypernym sequence of the Chinese sentence from the Chinese sentences in the corpus and form a complete set of part-of-speech sequences and hypernym sequences

3.3.2. *Set Test Parameters.* On the basis of corpus processing, the relevant parameters of system testing are set by using the open-source code, as shown in Table 2.

3.3.3. *Performance Comparison Test.* In order to further verify the application effect of this system, it is compared with the traditional real-time translation system (system 1) based on STM32 chip embedded recognition and the neural machine translation system (system 2) based on the fusion of various data generalization strategies. In the comparative test, the BLEU index is used to measure the quality of translations of different systems. The larger the BLEU value, the better the quality of the translation obtained by the system; the BLEU indicator calculation formula (17) is as follows:

$$\text{BLEU} = \varphi \times \exp \sum_{i=1}^n w_i \log_{10} p_i. \quad (17)$$

In formula (17),  $\varphi$  represents the penalty factor,  $w_i$  represents the weight of cooccurrence  $i$ -grams, and  $p_i$  represents the accuracy of  $i$ -grams.

## 4. Results and Discussion

The test results in Figure 4 show that, compared to the two conventional systems, the BLEU index of this system has always been maintained at a higher level, indicating that the translation quality obtained by this system is higher. This is because in the client of the overall architecture of the English machine translation system, the human-computer interaction technology is used to obtain the English sentences to be translated [18]. The semantic features of English sentences are analyzed using enhanced algorithms. The text to be translated is input into a deep structured semantic model, and its semantic features are enhanced through mapping processing and weighted average processing, thereby effectively improving the translation quality.

## 5. Conclusion

The author proposes an English vocabulary and speech corpus recognition system based on computer image processing; the system is aimed at achieving high-quality assisted translation of academic papers or academic works that require high academic, professional, and accuracy rates. The author starts from the analysis of the core modules of the system and the discussion of key technologies and explains the design and implementation process of the system in detail. Finally, the example data results show that this system has high quality and accuracy of auxiliary translation, can fully meet the translation needs of academic professional documents, and has good expansion and secondary development, especially for the rich lexical structure of historical memory segments; it can ensure relatively accurate translation; the translation and context fit greatly reduces labor costs. It has a significant influence in the field of English vocabulary and speech corpus recognition.

## 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 that there are no conflicts of interest.

## Funding

This study did not receive any funding in any form.

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