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Research Article

Research on Business English Translation Framework Based on Speech Recognition and Wireless Communication

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In order to improve the accuracy of English translation, reduce the error rate of translation results, and increase the correction rate of translation, this paper proposes a business English translation architecture design based on speech recognition and wireless communication. The architecture is partitioned according to the functions of the overall system design, and the voice acquisition module, voice processing module, and peripheral circuit module are designed according to functional requirements. Among them, speech recognition helps users to perform language translation to reduce the possibility of errors in the translation process. At the same time, it uses wireless communication technology to construct a business English translation corpus to meet the personal needs of users. The paper also uses an improved translation model for translation error correction and intelligent proofreading, which improves the reliability of translation results. Experimental results show that the system has a high error correction rate and error correction rate, and the translation results have a certain degree of reliability, which fully verifies the effectiveness and application value of the system.

1. Introduction

As a specialized English, business English contains a rich culture, including business traditions and customs in different countries and business etiquette habits [1]. For the business English translation, national cultural images are often lost or distorted, which may cause people to misunderstand other cultures and lead to transaction failures. Therefore, it is urgent to solve the problem of misplaced business English translation [2, 3]. At present, a number of high-quality dictionary and translation types of software have emerged on the mobile platform, providing complete Chinese-English translation, word query, and other functions, but they are still limited to the traditional text translation field and have not touched the increasing demand urgent voice translation function [4, 5]. Although some foreign translation software provides text-to-speech services, there are few translation tools to provide voice-to-text function, which still cannot fully meet the diversified translation needs of users [6]. Therefore, it is of great significance to study a multifunctional business English translation tool.

The authors of [7] designed a translation system based on deep learning and proposes a deep learning system for context-aware blind assessment. It is superior to traditional English translation tools in retaining the meaning of the text (translation adequacy), and the fluency of the translation system has been significantly improved. However, the translation results of the system are close to the quality of human translation and even have the problem of low error correction rate to some extent, which cannot effectively obtain the optimal translation results. The authors of [8] presented the results of an empirical study on translation productivity in interactive translation prediction (ITP) with an underlying neural machine translation (MT) system (NITP). The results show that over half of the professional translators in the study translated faster with NITP compared to PE and most preferred it over PE. This paper also examined differences between PE and ITP in other translation productivity indicators and translators' reactions to the technology. Reference [9] introduced the development from computer-aided translation (CAT) to neural network machine translation (NMT). With the real cases completed by Transn Company, it unveils the characteristics of engineering industry translation and the application of human-computer interaction platform in engineering translation. Furthermore, it is shown that the capacity gathering and adaptation through accurate projections can greatly save time and enhance the ability of translators in the engineering industry. The authors of [10] improved the translation quality of the neural machine translation compression model by using monolingual data and extracted implicit bilingual knowledge from monolingual data, thus improving the translation quality of small and low precision neural machine translation model (student model). This paper proposes a pseudobilingual data teaching method, which improves the student model by using the synthetic bilingual data obtained from the monolingual data translated by the teacher model, and then takes the probability distribution of the target language words obtained by the teacher model as the knowledge, so as to improve the translation quality of the model under the framework of knowledge distillation. The experimental results show that the proposed method improves the generalization performance of the translation model, but there is a problem that the grammar error correction module is not effective.

Aiming at the problems existing in the traditional English translation system, this paper studies and analyzes the rapid development of speech recognition technology and wireless communication technology. Combined with the functional requirements of the system, a language database is built in the system to improve the comprehensiveness of the translation results. The system has certain technical difficulties and innovations. This paper introduces the design and implementation of several core modules, such as the voice acquisition module, voice processing module, and peripheral circuit module, systematically solves the technical difficulties encountered in the development, and then effectively tests the system to demonstrate the feasibility and availability of the system.

The research innovations of this paper mainly include the following aspects:

(1) This paper proposes a business English translation architecture design based on speech recognition and wireless communication.
(2) It divides according to the functions of the overall system design and designs voice acquisition modules, voice processing modules, and peripheral circuit modules according to functional requirements.
(3) At the same time, it uses wireless communication technology to construct a business English translation corpus to meet the personal needs of users.
(4) Translation error correction and intelligent proofreading are carried out through an improved translation model, which improves the reliability of translation results.

The rest of this paper is organized as follows. Section 2 presents the architecture of the business English translation based on speech recognition and wireless communication. Section 3 proposes the strategy to improve the effect of business English translation. Test instances and performance metrics will be given in Section 4. In this section, the experimental results are also presented and analyzed. Finally, Section 5 sums up some conclusions and gives some suggestions as the future research topics.

2. Business English Translation Architecture Based on Speech Recognition and Wireless Communication

This chapter introduces in detail the relevant knowledge needed to construct the business English translation framework, designs the overall system architecture and system functions, and elaborates the functions of each module of the system. Finally, it introduces the basic concept of business English translation architecture and the software and hardware architecture, which paves the way for the design and implementation of English translation functions.

2.1. Overall System Architecture Design. The process of business English translation can be regarded as a process of applying knowledge for reasoning, and knowledge is the basis of this process. The knowledge representation forms used in translation are divided into internal knowledge and external knowledge. Among them, external knowledge is the knowledge stored in the knowledge base and managed by language workers, such as dictionaries and rule bases [11]; internal knowledge is generated temporarily in the process of translation, which is used to describe the grammar and semantic features of translated sentences, such as tree graph, feature structure, and semantic network. The architecture of MT and overall structure of business English translation are shown in Figure 1.

2.2. System Function Design. According to the overall structure of business English translation, the system function is analyzed. The system platform is based on speech recognition technology and wireless communication technology and uses B/S (Browser/Server) structure. Users can complete online real-time division of roles, role identification, collection and analysis of translation resources, testing, discussion, questioning, and submitting exercises and assignments. Users can cooperate through words, sounds, or graphics [12].

In the system platform, the former translation tools provide users with basic word and text translation functions, which are not flexible and comprehensive. Because of the small screen of mobile devices and the trouble of text input, the practicability of these translation tools is limited. With the development of speech recognition technology and wireless communication technology, the network access

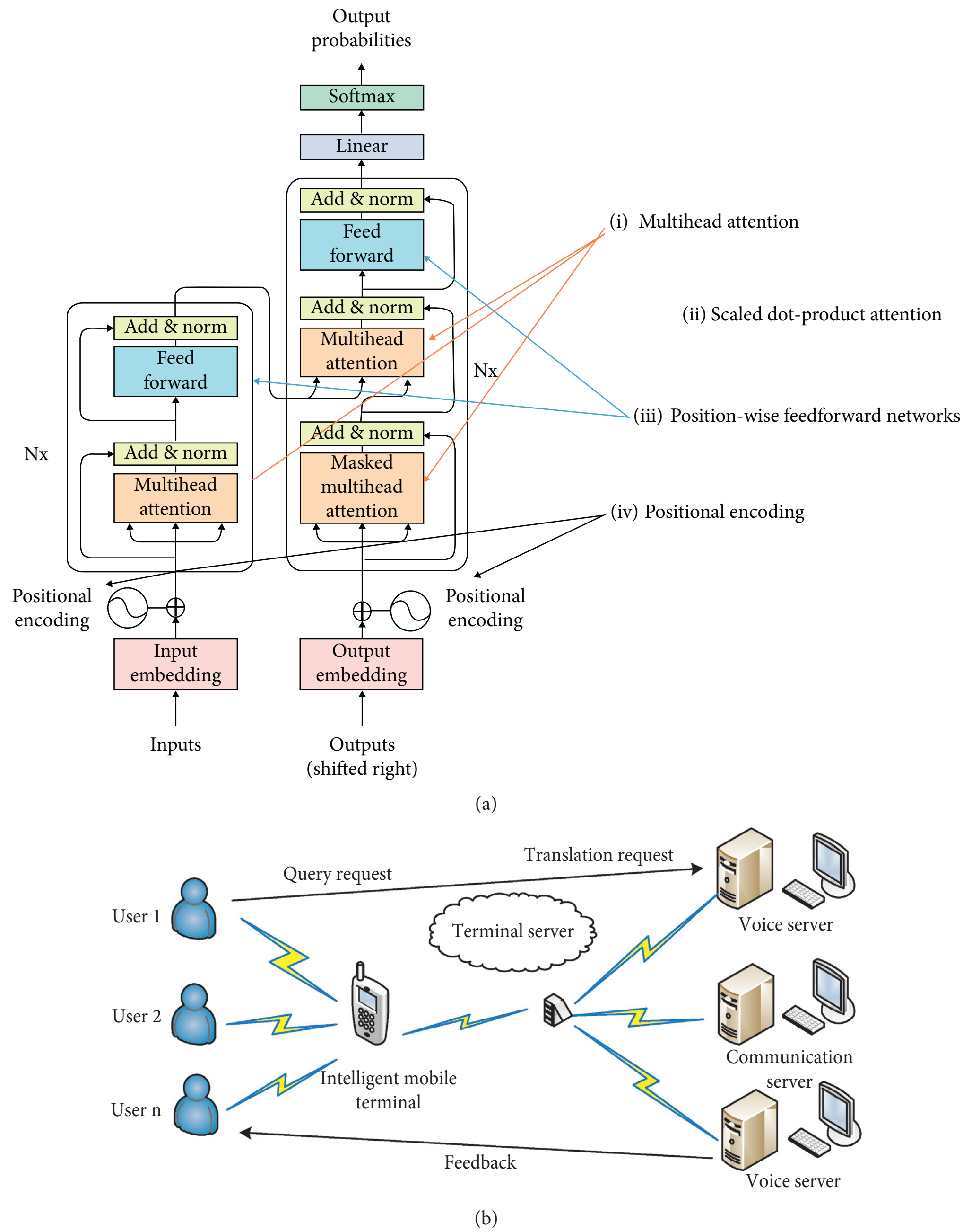

Figure 1: The overall structure of business English translation. (a) Architecture of MT. (b) Structure of business English translation.

ability and accessible services of mobile devices are greatly enhanced. Using some open public translation and voice processing cloud services can add some more practical functions to the translation system [13]. On this basis, the translation system is mainly designed for business negotiation application scenarios. The functional design of the system mainly focuses on the following points:

(1) To achieve a more rapid and accurate text translation function;

(2) The basic functions of text translation used to realize more complex functions such as document translation and short message translation;

(3) Providing voice translation function to improve user experience.

In order to provide special tool services for business negotiation scenarios, the main functions of the existing translation software in the market are examined and improved. Combined with the main functions mentioned above, the system function use case diagram as shown in Figure 2 is obtained.

According to Figure 2, users send requests to the server according to their own needs, such as requests for translation of relevant content or speech recognition translation. Therefore, the business English translation system should

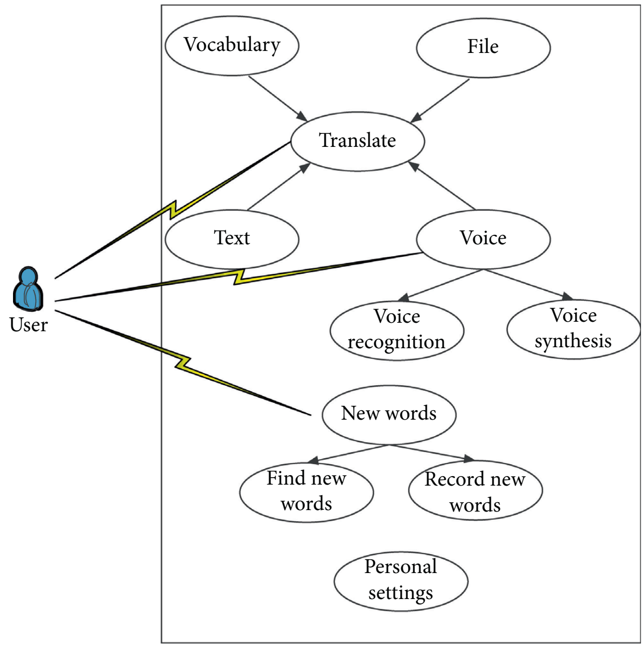

Figure 2: System function use case diagram.

contain a variety of translation resources, such as text, graphics and images, sound, video, and animation. When the server receives the request, it will send the relevant information to the user's browser, and users can translate through the browser [14]. If a user wants to discuss a problem with another remote user, he can log in to the discussion module in the system. The system receives the discussion information input by the user and broadcasts it to all users participating in the discussion. After the user discusses the module, other users in the system can be seen.

2.3. System Module Analysis

2.3.1. Voice Acquisition Module. The main function of this module is to realize the acquisition of voice signal and realize signal filtering, endpoint detection, and data normalization. Among them, the voice acquisition module is designed by using WM8731on the DE2 board. After setting with the I2C bus, it can work in the setting mode to realize the voice acquisition function. The acquisition unit mainly includes a PLL, I2C bus controller, and voice acquisition controller [15]. The system uses voice acquisition module to convert the voice data collected by the voice chip into 16-bit PCM code. The voice data is transmitted to the memory and saved, realizing the setting of 4 s recording time. The user can input 3 isolated words at one time, input the processed data into the subsequent memory address for storage, and store the detected words in the first address.

2.3.2. Voice Processing Module. Speech translation is one of the innovative functions of this system, and its core content is speech processing. Speech processing related to speech translation includes speech recognition and speech synthesis. Speech recognition function refers to the transformation of user's voice input into text form with the assistance of voice cloud and can ensure high translation accuracy [16]. When the user wants to use the voice translation function, first press the start button to trigger the voice recognition function. After finishing the speech, confirm the end. At this time, the system will transfer the recording file of the user's speech to the voice cloud for analysis and return the specific text after recognition. When users need speech translation, the system can combine the speech processing function with the translation function; that is, the text to be translated is obtained through the speech recognition function, the translated text is obtained through the translation function, and the pronunciation of the translated text is obtained through the speech synthesis function.

Audio interface chip uses codec chip, which has a low price and can support wire control standard. It is the most commonly used full-duplex audio chip in an embedded system. Because of the timeliness of speech signal processing and a large number of recorded and played voice signals, if the voice transmission and reception use the first-in-first-out queue for buffering, according to the terminal, data will be sent to the system. If the cost is high and the sound recording and playing cannot be guaranteed reliably, then the audio recording and playing should be realized by DMA [17]. Using this method to record and play the data can realize the setting of the destination address, data source address, and length and can also automatically send buffer to realize filling. Until the specified length of data is achieved, the system can apply for interruption. Multiple buffers are created through memory to record and play audio data effectively. The controller developed by Samsung company is used in the design of voice processing module. The core structure of the ARM processor is shown in Figure 3.

Generally, the auxiliary functions of the speech processing module are processing, recording, and transmission, but the computer and natural language are quite different. How to accurately recognize the difference between the two languages is a problem that needs to be solved in the recognition process of translation software. Feature extraction is the most basic content of modern speech recognition systems. It can effectively extract features of English language, send accurate language signals to the translator, and improve the accuracy of computer translation work [18]. The speech recognition system requires matching corresponding modules, which can assist the user's language translation and reduce the probability of errors in the translation process.

2.3.3. Peripheral Circuit Module. Flash memory can realize the function of electric erasure in the system, the information will not be lost after power failure, and the capacity is large, so it is widely used in various systems. Nand memory with high performance is used in the integrated controller of the system, the data storage capacity is 64 MB, and the storage management is realized by block page. SDRAM chip has large capacity, low cost, and fast access speed. It is widely used in crisis management system. SDRAM can store variables and codes, which refers to the memory accessed after

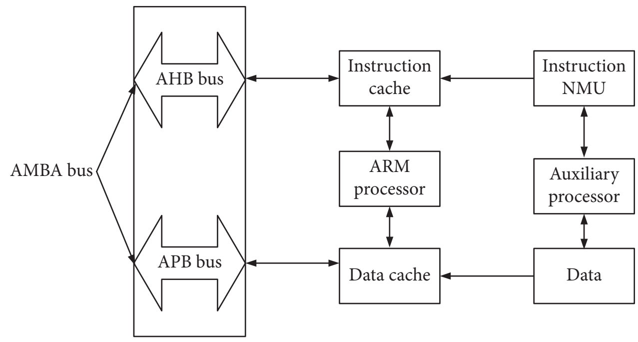

Figure 3: Speech processing module ARM processor core structure.

the system is started [19]. Because SDRAM should be able to refresh regularly, so as to ensure the accuracy of stored data, the microprocessor requires the function of refreshing control logic. In this paper, S2C2410 microprocessor chip is used to realize the setting to meet the actual needs of speech recognition system, and Samsung chip is used to create memory system. Figure 4 is the schematic diagram of peripheral circuit module.

3. Improving the Effect of Business English Translation Based on Wireless Communication Technology

In the era of mobile big data, the rapid development of wireless communication technology and mobile Internet has strengthened the carrying capacity of wireless networks and has a wider coverage, which in turn enables people to realize mobile learning anytime, anywhere through mobile communication devices such as mobile phones and tablets. Mobile learning can realize the three-dimensional access between people and people, people and things, and things and things in different scenarios and is more and more popular among young people. This provides a brand new platform for the application of business English translation system design. Based on wireless communication technology, a business English translation corpus is constructed, and the errors in business English translation are corrected in time. In order to further ensure the accuracy of translation results, the translation model is used for intelligent proofreading of translation results, so as to realize the overall design of business English translation framework based on speech recognition and wireless communication.

3.1. Construction of Business English Corpus Database Based on Cloud Architecture. Through the development of business English major and the goals and requirements of application scenarios, the basic selection principle of corpus can be obtained: "starting from the cultivation of the ability to distinguish and adjust sounds, the training of listening, pronunciation, and oral expression is closely combined, emphasizing the training of basic functions and paying attention to practice" [20]. The construction of business English multimedia corpus database mainly includes the following aspects:

(1) Basic Knowledge and Content of Phonetic Training

(1) The comprehensive training of English phoneme's correct pronunciation method, distinguishing ability, and imitation ability is as follows:

$$z_i^k = z_i^{k+1} + v_i^{k+1}, \tag{1}$$

where z_i^k represents the basic knowledge of voice training; z_i^{k+1} represents the pronunciation standard; v_i^{k+1} represents the voice recognition ability [21].

(2) For the teaching and training of the basic laws, expression forms, and ideographic functions of English word stress and sentence stress, the following specific calculation formulas are given:

$$K_{ik} = z_i^k \left(\frac{\tau_n}{d\tau_i} - \frac{\tau_m}{d\tau_i} \right), \tag{2}$$

where τ_n and τ_m represent the more frequently used and less frequently used words in business English translation, respectively; τ_i represents the total amount of English elements in the corpus; d represents the space storage capacity of the corpus.

(3) The rhythm, basic characteristics, basic elements of English language flow, and training of strong and weak reading styles.

(4) The peculiar pronunciation, intonation structure, function of business English, and its use in communication.

(2) Business English Translation Content

Incorporate teaching materials of basic English, reading, listening, and speaking courses into the corpus to create a good environment for the English translation and improve the effect of the English translation [22].

(3) Business English Training Content Based on Network Resources

Construct English multimedia materials, and perform English translation exercises by storing voice training content as different forms of corpus resources and effectively enhancing the real time and effectiveness of obtaining English translation information. Among them, the effective resources in the corpus can be expressed by the following formula:

$$h_{ik} = \frac{h_i - h_n}{h_a} - \frac{h_i - h_m}{h_b}, \tag{3}$$

where h_n represents the correct English translation result; h_m represents the wrong English translation result; h_a represents the effective language element in the corpus; h_b represents the invalid language element in the corpus [23].

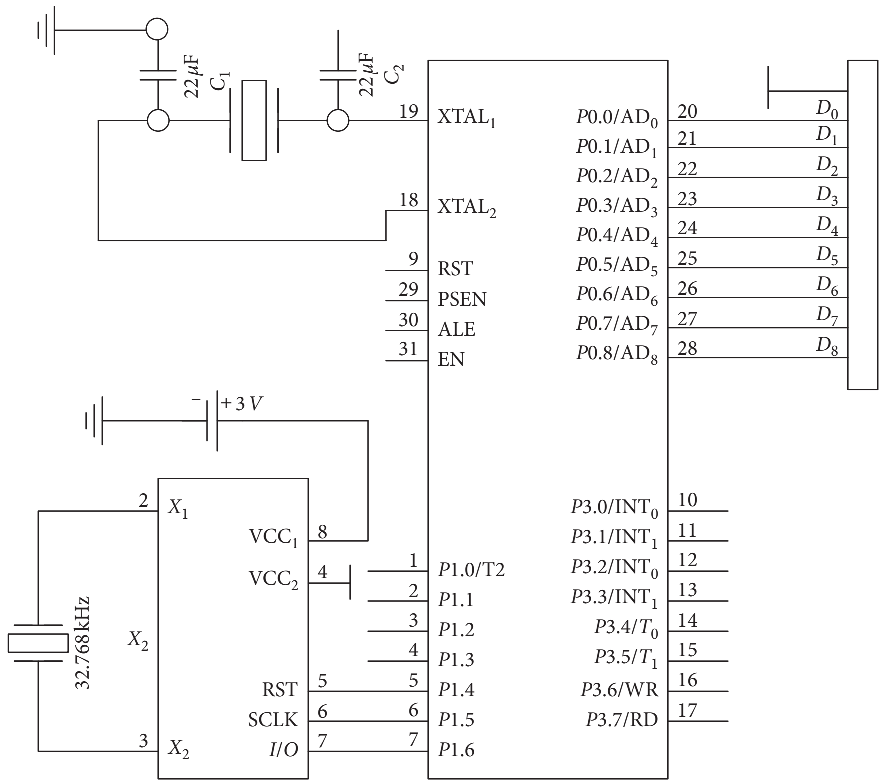

Figure 4: Schematic diagram of peripheral circuit module circuit.

(4) The establishment of personalized business English translation corpus; that is, users can collect English materials that are suitable for their own language level and content and interest to carry out independent translation training. It can meet the users' personal needs and make full use of the corpus.

3.2. Correction of Translation Errors. It is based on a cloud-based business English corpus database, in order to improve the accuracy of business English translation results, improve translation effects, and correct errors in translation.

According to the content to be translated, the semantic similarity estimated by Jiang-Conrath is used to roughly select a part with relatively similar semantics from the database to form a similar set. The Jiang-Conrath method used for semantic similarity is a method based on corpus statistical analysis and WordNet to calculate the semantic similarity between words. The accuracy of this method is close to the upper limit of manual judgment. Assuming that there are two words p and q, the semantic distance $\text{dist}(p, q)$ between them is defined as

$$\text{dist}(p, q) = x_i + \rho_t^I \left(x_{p\max} - x_{p\min}\right)\left(x_{q\max} - x_{q\min}\right). \quad (4)$$

Among them, $x_{p\max}$ and $x_{p\min}$, respectively, represent the words with the largest and smallest similarity features with p; $x_{q\max}$ and $x_{q\min}$, respectively, represent the words with the largest and smallest similarity features with q; x_i represents the amount of statistical information in the corpus, and it is calculated by the following formula:

$$x_i = \sum_{i=1}^{N} w_i \text{dist}(p, q). \quad (5)$$

where N represents the feature similarity coefficient; w_i represents the probability value of the invalid language element in the corpus [24].

The semantic similarity is the inverse of the semantic distance; that is,

$$P(k) = \sum_{i=1}^{N} [1 - w(k)]^i = \text{dist}_{\min}(p, q) \frac{1}{\left(1 - \left(1/L_k\right)\right)^{k-1}}, \quad (6)$$

where $w(k)$ represents the element set after excluding invalid language elements; L_k represents the corpus difference coefficient.

In the process of judging the similarity of business English corpus, the similarity is defined as the sum of the semantic similarity between words and the semantic similarity between sentences:

$$T_{ab} = pq_N + cv_N, \quad (7)$$

where pq_N represents the semantic similarity between words; cv_N represents the semantic similarity between sentences. Through the similarity measurement results, the invalid language elements are removed to realize the preliminary correction of translation errors [25].

3.3. Intelligent Proofreading Method for Translation Errors Based on Improved Translation Model. As there are a large number of language elements in the corpus, only the invalid language elements can be eliminated through Section 3.2, which cannot guarantee the accuracy of the translation results. Therefore, the intelligent proofreading method based on the improved phrase translation model is further used to correct the translation errors and realize the accurate output of the translation results. The transformation from one form of text to another is the common ground of English translation and English translation proofreading. Therefore, the process of intelligent proofreading of English translation errors is actually to compare and replace the results of proofreading and initial translation, so as to realize the intelligent proofreading of the English translation.

Definition H represents the wrong English translation result, and H' represents the correct English translation result. The process of transforming H into H' is the process of translation error proofreading. The content to be proofread is expressed in the form of a collection:

$$U = \{u_1, u_2, \ldots, u_n\}. \tag{8}$$

In the above equation, u_n represents the total amount of content to be proofread.

First, construct a judgment matrix U' to judge the importance of business English translation:

$$U' = \begin{bmatrix} u_{11} & u_{12} & \cdots & u_{1n} \\ u_{21} & u_{22} & \cdots & u_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ u_{n1} & u_{n2} & \cdots & u_{nm} \end{bmatrix}. \tag{9}$$

According to formula (9), the accuracy of vocabulary translation in the results obtained by traditional English translation methods needs to be improved. Therefore, when designing an intelligent proofreading method, the accuracy of vocabulary translation should be corrected. The specific method is as follows.

If the weight (or authority) of each evaluation factor is represented by a fuzzy set, then the comprehensive evaluation result of the thing is

$$b_i = \min \sum_{i=1}^{m} \omega_i \times s_{ij}. \tag{10}$$

In the above equation, ω_i represents the weight of the accuracy of the word translation result; s_{ij} represents the probability of translation error.

In order to facilitate the expression of the computer intelligent proofreading method based on the improved phrase translation model, it will be used as the vocabulary to be proofed, and the proofreading completed vocabulary is represented by J_k. It is defined that z characters exist in J, denoted by J_z, and these characters correspond to the vocabulary in the English translation model; at the same time, there are r characters in J_k, denoted by J_{kr}.

Divide J_z into g character strings randomly, where the character strings correspond to the vocabulary in the English translation model. Similarly, divide J_k into g' character strings randomly to achieve the corrected result:

$$PN = \frac{P - \min(g)}{\max(g) - \max(g')}. \tag{11}$$

In the process of intelligent proofreading of business English translation results, the key point is to find a method suitable for dividing the words to be proofread and proofread the words to be proofread in turn and arrange the proofreading results so as to be used in the later translation. By improving the translation model, the intelligent proofreading of English translation errors is realized, which lays a solid foundation for the reliability of business English translation results.

In conclusion, based on speech recognition technology and wireless communication technology, the overall architecture and module design of business English translation systems are realized. On this basis, the intelligent correction of translation results is realized by relying on the business English corpus database and improved translation model.

4. Experiment

In order to verify the application effect of a business English translation framework based on speech recognition and wireless communication, the simulation experiment is carried out. In the experiment, design a translation system based on deep learning [7], an interactive English-Chinese translation system based on feature extraction algorithm [8], and a system based on joint minimum Bayesian fusion [9] as a comparison.

4.1. System Verification Environment Design. Figure 5 shows the architecture diagram of the simulation experiment environment.

Figure 5 shows the system structure of the system simulation experiment environment. From the structure, it can be seen that different sensors and experimental structures have different effects on the simulation experiment. The specific hardware configuration parameters of the server in Figure 5 are shown in Table 1.

Specific experimental operations are performed in the simulation experimental environment architecture shown in Figure 5. In order to save experimental time, the method of manually inputting the target English terms is not used for the experiment, but an automatic input program is written through the Java language. The search results are formed into massive Internet data clusters, and experiments are carried out in this environment. Search 500 translation instruction tasks in the massive Internet data cluster to obtain the effect of error correction modules of different systems, the probability of repeated translation, the probability of missing translation, and the accuracy of translation results.

Data preprocessing is an important step in ASR. So, the first step of this experiment is to process the original data. The preprocessing includes preemphasis and framing. The purpose of preemphasis is to enhance the high frequency part of speech, remove the influence of lip radiation, and increase the high frequency resolution of speech. Generally,

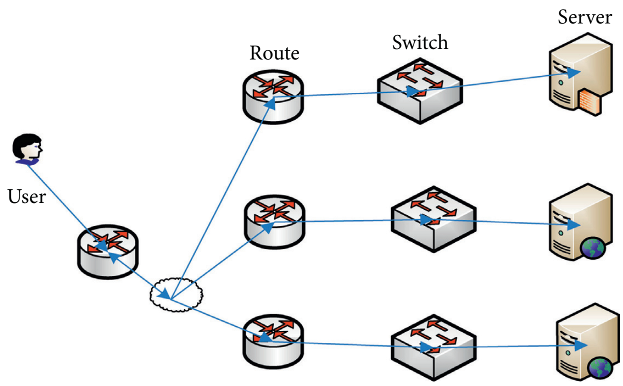

Figure 5: Simulation experiment environment architecture.

Table 1: Server hardware configuration.

Hardware	Specific configuration
CPU	Frequency above 850 Hz
RAM	1 T
Motherboard	ATX architecture
Graphics card	AGP
Network card	100 Mb/s
Hard disk	60 Gb

the transfer function is a first-order FIR high-pass digital filter. The purpose of framing is to divide the data into convenient data frames.

4.2. Evaluation Criteria. Since the presentation of translation results of different systems is different, different evaluation criteria are used for the evaluation of test results. The error correction effect, that is, the error correction rate, is used as an evaluation indicator, and the results submitted by different systems are compared with the correct answers referenced. Specifically, formula (12) is used to evaluate the effect of error correction, which is defined as

$$\text{Precision} = \frac{\sum_{i=1}^{n} \left|g - g'\right|}{\sum_{i=1}^{n} \max(g) - \max(g')}. \quad (12)$$

In the above equation, $|g - g'|$ represents the number of translations that meet the reference correct answer after correcting the answer.

Another indicator, Recall, evaluates the system's correction ratio for all errors that should be corrected, that is, the correction rate, which is defined as

$$\text{Recall} = \frac{\sum_{i=1}^{n} \left|g \cap g'\right|}{\sum_{i=1}^{n} |g|}. \quad (13)$$

In the above equation, $\sum_{i=1}^{n} |g|$ represents the number of correct corrections.

4.3. Experimental Results and Discussion

4.3.1. Comparison of Error Correction Rate and Total Error Rate. Before the experiment, users' behavior habits were analyzed, and it was known that users usually only looked at the search results of the previous pages when using the search system. Therefore, a program to automatically calculate the average value was written in Java language. The error correction results of the designed system, the system in [7], the system in [8], and the system in [9] were counted. The results are shown in Table 2.

Analysis of the data in Table 2 shows that the error correction rate reaches 97.3% and the total correction rate reaches 98.5% when using the designed system to correct translation errors, while the error correction rate and correction rate of the system in [7], the system in [8], and the system in [9] are significantly lower than those of the designed system. Moreover, the response time of the designed system is the shortest and the search efficiency is higher, which not only improves the correction rate and error correction rate of the system but also improves the operation efficiency of the system. Through the data comparison, it can be seen that the designed system can effectively correct the errors in English translation, and the correction results are more reliable. This is because the method sends accurate language signals to the translator based on speech recognition technology, which improves the accuracy coefficient of computer translation, and can assist users in language translation and reduce the probability of errors in the translation process. Thus, the error correction probability is higher, and the correction result has the advantage of comprehensiveness.

4.3.2. Comparison of the Probability of Repeated Translation. In principle, repeated results in translation results are not allowed to exist. However, in massive Internet data clusters, there are some differences in data structure characteristics between repeated results. It is impossible to completely eliminate duplicate results, which can only be extremely reduced. Therefore, the repeated translation probabilities of different systems are compared, and the results are shown in Figure 6.

As shown in Figure 6, although there are repeated translations in the designed system, there are not many repeated results, and the probability of repeated translation is low. However, the repetition rate of the system in [7], the system in [8], and the system in [9] is much higher than the strategy proposed in this paper. So, we can draw that the proposed strategy has certain advantages in terms of the repetition translation probability.

4.3.3. Comparison of the Probability of Missing Translation. Similar to the repeated translation probability, the omission result in the translation result is not allowed to exist in principle. Therefore, the probability of missing translation is the lower the better. Figure 7 gives the comparison of missing translation probability.

The result of Figure 7 shows that the missing translation probability of the designed system is always lower than that of the other three strategies, and the highest value of the missing translation probability of this scheme is less than 0.2. Compared with the other three strategies, the proposed

Table 2: Comparison of error correction effects of different systems.

System	Response time (s)	Error correction rate (%)	Correction rate (%)
Designed system	0.09	97.3	98.5
Reference [7] system	0.15	59.6	75.2
Reference [8] system	0.28	64.2	68.3
Reference [9] system	0.19	71.0	70.1

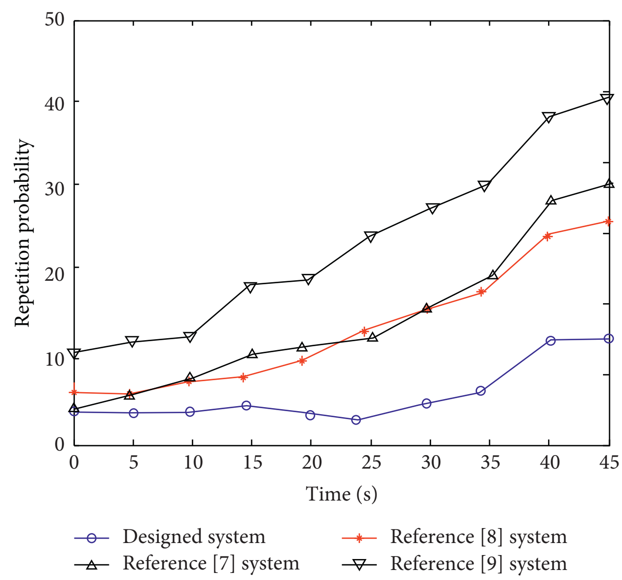

Figure 6: Comparison of repeated translation probability.

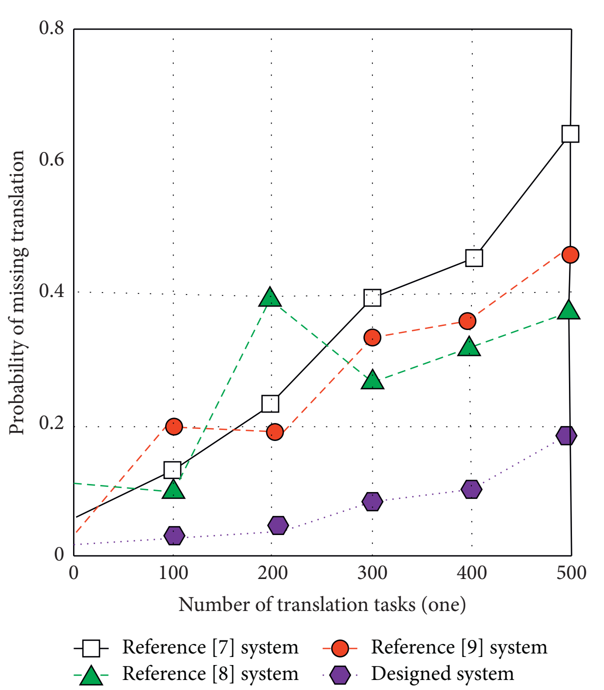

Figure 7: Comparison results of missing translation probability.

scheme has obvious advantages in the aspect of missing translation. The reason is that, in the design process, this system can help to obtain the similarity between different English languages and can help to remove the invalid language elements.

4.3.4. Comparison of Accuracy of Translation Results. The accuracy of translation results of different systems is shown in Figure 8.

It can be seen from Figure 8 that the translation accuracy of the proposed scheme is much higher than that of the other three strategies, but it is only slightly higher than that of the strategy proposed in [9]. The main reason is that the method proposed in this paper overcomes the problem of inability to solve the problem of lexical error correction by the similarity relationship between words. According to the experimental results, the designed system has certain advantages in evaluating the accuracy of business English translation.

In addition, the experimental results of this system are evaluated based on reference sentences generated by bilingual human experts. The reference sentences cover all linguistic variants of English taxonomy. The result of 0.78 and 0.10 was obtained by the BLEU and WER, respectively.

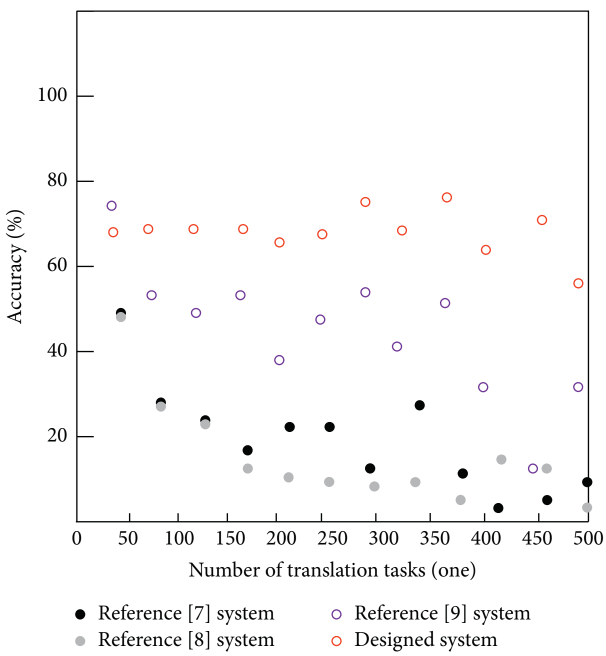

FIGURE 8: Comparison of accuracy of translation results.

5. Conclusion

To solve the problems of low accuracy of business English translation results and low correction rate and error correction rate of traditional methods, a business English translation framework based on speech recognition and wireless communication is designed. The use of speech recognition technology can convert the user's voice input into text form and can ensure a high translation accuracy, which effectively solves the problem of low error correction rate in the traditional system in the translation process. After the realization of speech recognition, the corpus and intelligent proofreading method of translation errors are designed by wireless communication technology, which can effectively identify the errors in translation and further improve the translation effect. The experimental results show that the error correction rate of the system is 97.3%, and the correction rate is 98.5%. The accuracy of the translation results is higher, which fully verifies the comprehensiveness and reliability of the system.

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 there are no conflicts of interest regarding the publication of this paper.

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