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Research Article

Interpersonal Interface System of Multimedia Intelligent English Translation Based on Deep Learning

Xiaojing Li[1] and Shuting Ding[2]

[1]*Qingdao Agricultural University, Qingdao 266109, Shandong, China*
[2]*School of Foreign Languages, Qingdao Agricultural University, Qingdao 266109, Shandong, China*

Correspondence should be addressed to Shuting Ding; 200401052@qau.edu.cn

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Artificial intelligence is a very challenging science, and people who are engaged in this work must understand computer knowledge, psychology, and philosophy. Artificial intelligence includes a wide range of sciences; it is composed of different fields, such as machine learning and computer vision. In recent years, with the rise and joint drive of technologies such as the Internet, big data, the Internet of Things, and voice recognition, the rapid development of artificial intelligence technology has presented new features such as deep learning, cross-border integration, and human-machine collaboration. Intelligent English translation is an innovation and experiment of the English language industry in the field of science and technology. Machine translation is the use of computer programmes to translate natural language into a specific natural language. This interdisciplinary subject includes three subjects: artificial intelligence, computational linguistics, and mathematical logic. Machine translation is becoming more and more popular with the public, and its advantages are mainly that machine translation is much cheaper than manual translation. From this study, it can be seen that the accuracy rate of the traditional ICTCLAS method is 76.40%, while the accuracy rate of the research method in this article is 94.58%, indicating that the research method used in this article is better. Machine translation greatly reduces the cost of translation because there are very few processes that require human participation, and the translation is basically done by computers. It is also an important research content in the field of English major research. Due to the wide range of language cultures and the influence of local culture, thought, and semantic environment, traditional human translation methods have many shortcomings. Nowadays, the demand for translation is unsatisfactory. Based on this, this paper analyzes the application status of intelligent translation, the prospect of intelligent translation, and realizes the optimization design of the human interface system for the intelligent translation of English. Through experiments, it is found that the multimedia intelligent English translation system based on deep learning not only improves the accuracy of English translation but also greatly improves the efficiency of people learning English.

1. Introduction

The process of machine translation is very simple, and the translation time can be estimated more accurately. The running speed of computer programmes is very fast, which cannot be kept up with manual speed. So far, machine translation has experienced several key turning points in its development, and with the good development and application of artificial intelligence in many aspects, especially in the fields of image, speech, and natural language processing, machine translation has once again used neural networks to continue to move forward. Language and text are the main tools for communication between people. Different countries and ethnicities have different languages. Language barriers have always been the biggest difficulty in communication between people of all nationalities in the world. With the rapid development of computers, English has become the universal language. With China's rapid economic development, foreign exchanges have become more important, and people's growing desire for knowledge has made the Internet the fastest and most convenient way for Chinese people to understand the world. At present, English

is the most populous language in the world, which leads to a large amount of information on the Internet being in English. Although English is now widely educated in China, only a few people have a higher level of English. For most people, there is still a long way to go to translate English information accurately. With the progress of the translation industrialization process, the research on English multimedia intelligent translation is particularly important in today's environment. Excellent and accurate translation will make people understand that the world becomes simpler.

For instance-based machine translation, the main knowledge source is the instant translation library of parallel corpus. There are mainly two fields of information in the library: one is the source language sentence and the other is the corresponding target language sentence. When inputting a source language sentence, the translation system finds out the source language sentence that is most similar to the sentence in the library and simulates the corresponding target language sentence to translate the corresponding translation. The whole translation process is to find and reproduce, only to compare, without analyzing the source language sentence. China's economy is developing rapidly, and China's opening up to the outside world is also following the development of the new era. Based on the development of globalization, science and technology are also continuing to innovate and progress, thus realizing diversified foreign language learning pathways, including the development of translation tools. The demand for its practicality and functionality is also constantly improving, and it also makes English intelligent translation a research focus. For example, in May 2018, Wang Qiqi made a deep discussion on the application status of the language service industry in artificial intelligence, analyzed its background and application status, and made suggestions and prospects [1]. In May 2018, He Liutao discussed a series of problems in the development of intelligent translation in the context of artificial intelligence and proposed solutions, which played a realistic role in the development of intelligent translation in China [2]. In August 2018, Zhang Fan used the statistical machine translation method based on maximum entropy to obtain relevant parameters through direct maximum entropy model training and obtained the best combination of different English language features to solve partial structural ambiguity in the massive English language. The problem is to improve the accuracy of English machine translation [3]. In March 2019, Qi Qiyu, based on the analysis of the background of the times from the perspective of translation theory, expounded the application of artificial intelligence in the translation industry, analyzed the positive and negative effects of artificial intelligence on translation, and combined the actual translation practitioners and language learners to make relevant suggestions [4]. Due to the needs and importance of intelligent translation in today's society, many areas of research are now exploring intelligent translation and have achieved good results [5–8].

With the deepening of human-machine interface research, in intelligent recognition, the human-machine interface system is the main component of intelligent recognition. Many studies have used the human-machine interface and achieved good results. For example, in June 2018, Yinxiang, Yu Kang, Jin Chengqian, and Du Juanlin designed and developed the human-machine interface to test with the navigation controller. The results show that the human-machine interface can send operation instructions according to the established serial communication protocol. Receive data and information from the navigation controller. It can meet the requirements of human-computer interaction in the automatic navigation system of agricultural machinery [9]. In September 2018, Bao Jiaming designed a new multitank multitemperature water heater structure and designed the touch screen human-computer interaction control interface design of the water heater with the single-chip microcomputer as the core controller. It is capable of simultaneously supplying high-temperature boiling water, boiling hot water, and cold water below 10°C [10]. In February 2019, Xu Xinyu analyzed the development trend of the human-machine interface under the guidance of artificial intelligence from three aspects: recommendation systems, computer vision, and speech recognition, and summarized and forecasted the future development direction of the human-machine interface [11–14].

Machine translation is a technology used in computer technology to transform a natural language into another language. It is an emerging science technology that combines multiple disciplines and integrates them with each other. It promotes the field of intelligent translation. The development of research achieved a lot of results in the field of intelligent translation. For example, in March 2019, Lu Wenjie, Tan Ruyi, Liu Gongshen, and Sun Huanrong proposed a semi-supervised neural network model for small-language translation based on the analysis of the coding-decoding framework and attention mechanism [15]. In April 2019, Zhou Jianing studied the development history and purpose of simultaneous interpretation, explored the theoretical basis of speech recognition and machine translation, focused on the implementation of speech recognition and machine translation, and designed a simultaneous interpretation system based on *c#* language [16]. The existing methods of machine translation also show unique advantages in other languages [17–20].

Through the research on the application status of intelligent translation and the prospect of intelligent translation, this paper finds that the practical application function and market demand of intelligent translation from now to the future are very high. Based on the advantages of the human-machine interface system, this paper studies the English multimedia intelligent translation. According to the hierarchical phrase translation model in machine translation, combined with its own learning experience, the human-machine interface translation system consists of four parts: preprocessing, image segmentation, feature extraction, and classifier design. Through the experimental test, the human-machine interface translation system designed in this paper has made a certain breakthrough in the correct rate recall value compared with other systems, and can complete the translation work with high quality [21–23].

2. Design of Human-Machine Interface Translation System

The simplest definition of a human-machine interface is that between a person and a machine, through a certain interface, the person can give instructions to the machine, and the machine can report the execution status and system status to the user through this interface. In other words, the correct communication of information and instructions between man and machines is the main definition of human-machine interface. The display, main unit, and image acquisition card mainly constitute a complete hardware component of the human-machine interface translation system. According to the function, the software system can be divided into several parts: preprocessing, feature extraction, image segmentation, and classifier design. The processing flow is shown in Figure 1.

The processing flow of the human-machine interface translation system is one of its processing flows. First, the collection card is used to obtain a video stream through the detection system, so that each frame in the video stream belongs to the processed image; second, the image is grayscaled and the background is removed to get a binarized image, which is then cut to get text and character images; third, extracting the character feature and extracting the word recognition result by the classifier; and fourth, displaying the Chinese term corresponding to the word.

$$\begin{aligned} A_k &= G^{eu_i} M\left(\vartheta_j\right)^{IJ}, \\ JK_M &= FM\left(\lambda_j\right)^{C}, \\ MK &= g^{D+u_i e/F}, \\ G_S &= M^{u_0}. \end{aligned} \tag{1}$$

2.1. Pretreatment. Pretreatment refers to the preparation process carried out before the final processing and perfection, which is specifically applied in different industries or fields. Because the content processed by this system is obtained from the detection host interface through the collection card, and there is no distortion, most of the detection programme interfaces are also composed of tables, characters, etc. The contents of the characters are removed to obtain binarized text. The description is based on the regional grayscale difference growth algorithm, and the text is scanned horizontally and vertically, respectively. When the accumulated value is larger than the preset threshold, it is represented as a table line, thereby obtaining a binarized text. Binarization is the simplest method of image segmentation. Binarization can convert grayscale images into binary images. The grayscale of pixels is set greater than a certain critical grayscale value to the maximum grayscale value, and the grayscale of pixel is set less than this value to the minimum grayscale value, so as to achieve binarization.

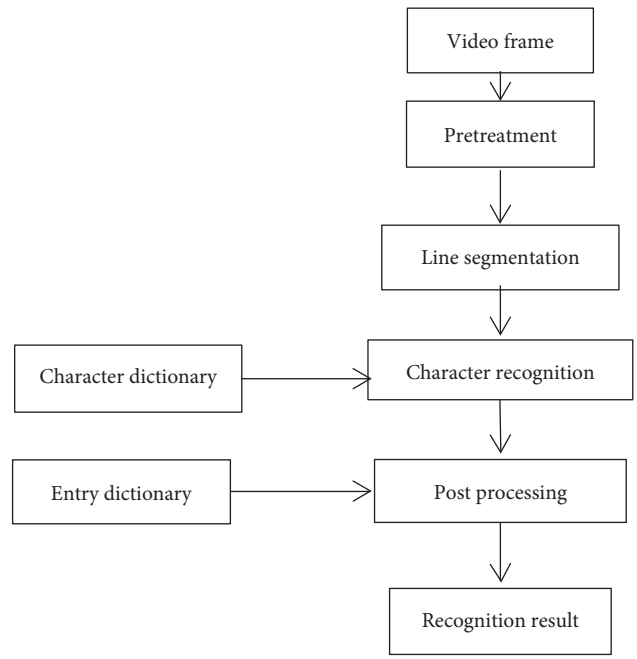

Figure 1: Process flow of the human-machine interface translation system.

$$\begin{aligned} Z_0 &= MX^s e(G,M)^{AS} = J(G,M)^{AS}, \\ B_1 &= G^{\beta \cdot s}, \\ B_2 &= G^{\delta \cdot s}. \end{aligned} \tag{2}$$

Decoder-end weight sharing can complement each other during model training:

$$\begin{aligned} V_j &= V - \sum_{i=1}^{N-1} \frac{V_i}{p}, \\ R_{i,j,2} &= T + H. \end{aligned} \tag{3}$$

2.2. Image Segmentation. Image segmentation is the technique and process of dividing an image into a number of specific areas with unique properties and proposing objects of interest. It is a key step from image processing to image analysis. The right segmentation is the only way to get the right goals and implement them effectively. The gap between the lines obtained after the horizontal projection is also a blank line, and the gap threshold is set to realize the division of the character line. But this algorithm is complicated and time-consuming, especially when the calculation amount is too large, it is not suitable for use in this system. Therefore, for overlapping characters, it is possible to implement cutting by using a broken character. The part of the shadow belongs to the overlapping part of the character, which does not cause a cumulative error, and should be fully considered when identifying, so that the recognition accuracy rate is reduced. To make this shaded part, you can extend the shadow part.

$$
\begin{aligned}
C_{i,j,1} &= F^{H}, \\
C_{N} &= C_{0}, C_{1}, C_{2}, \ldots, C_{J}, \\
\mathrm{H}_{i,j} &\in M_{p}^{*}\left(1 \le i \le n, 1 \le j \le n_{i}\right), \\
T_{i,j} &= R^{t_{i},j}, \\
P_{M} &= YU, \\
\mathrm{R} &= \left\{\kappa_{1}, \kappa_{2}, \kappa_{3}, \ldots, \kappa_{n},\right\}.
\end{aligned}
\tag{4}
$$

2.3. Feature Extraction. Statistical machine translation is the mainstream method of machine translation today. This may be due to many reasons, such as accuracy, scalability, high computational efficiency, and the ability to quickly transplant to new language pairs and domains. The hierarchical phrase translation model is one of the mainstream models of statistical machine translation. This model combines the traditional phrase translation model with a syntactic translation model, which greatly improves the translation performance compared to the traditional phrase translation model. At the same time, analysis errors and system burdens caused by the ability to analyze sequences are avoided.

The extraction process of hierarchical phrase rules includes the extraction of common phrase rules and the extraction of rules containing variables. The most basic condition for extracting a phrase is "alignment consistency." When extracting variable rules, by enumerating all possible combinations in the SPAN range, there are three possibilities, including variables, one variable, and two variables. The rules mainly include source, target, two-way lexical translation probability, and two-way phrase translation probability. The calculation needs to estimate the fraction of each phrase. For rules without variables, the fraction is 1 each time the rule is extracted. For the rule containing variables, the fraction is one of the total number of variables. When calculating the probability of bidirectional phrase translation, fractions are used to calculate. Hence, the project implementation details need to be paid attention. When the number of extracted rules reaches a certain level, you need to output the temporary file and clear the used memory.

The classifier belongs to the core of the recognition system. The feature extraction and classifier settings are all key content. If the feature extraction has certain certainty, the classifier design and capability can be simplified, and the feature extraction is restricted. In order to realize the separability judgement between various types, a variety of criteria are proposed, and the minimum feature dimension is realized to improve the accuracy of classifier classification. The distance between the sample to be used and the end of the benchmark is a function of the classification decision. This classifier is preferred by the employer. According to practice, this is a more intuitive and effective classification.

A single English word is identified by the classifier because classification errors are unavoidable, so the result of the classification is further processed. The process of classifier implementation of classification is mainly to achieve single-character recognition and does not fully use the context information. For the result of repeated character segmentation, the candidate characters are incorporated into the words according to the order of confidence from high to low and then searched from the dictionary. After the search is successful, this is the result of the recognition. If the candidate's character is illegal, then the character is rejected. For words with rejected characters, they are ignored during word search.

In order to improve the translation effect, not only the words should be explained one by one but also the translation of complex, long sentences. Then, based on the actual characteristics, this paper will make a sentence or phrase combination that cannot satisfy the Chinese word order habits as a whole and achieve effective recognition. For shorter sentences, you can also use the above method. However, for longer paragraphs or sentences, such as helper documents, if this type of processing is used, the processing cannot meet the real-time requirements of the system. Then, you can use the sample matching method to achieve full-text matching and finally achieve full-text translation. Among them, the interface of the detection system and the screen change are more frequent in order to realize data collection. In scene development, changes in the collected data generally do not affect the scene detection system, and scene switching will not change too much, which reduces the system burden and improves the interface display effect.

3. Application Status of Intelligent Translation

In recent years, artificial intelligence technology has made great breakthroughs in the direction of speech recognition and language processing. Artificial intelligence has also made new progress in language translation and has been widely used in many fields.

3.1. The Level of Technological Development. In terms of voice technology, in recent years, deep learning artificial intelligence has also made great progress in the direction of language processing, especially in machine translation. In February 2011, IBM's "Watson" system conducted a natural language question and answer in the dangerous edge of a variety show, defeating two human champions, indicating a significant improvement in the computer's natural language processing capabilities. Google has applied the Google Neural Machine Translation (GNMT) system to enable the translation of complete sentences, which is a landmark breakthrough in artificial intelligence in machine translation. Domestic Keda Xunfei, Tencent, NetEase, Baidu, and other companies have also launched free online translation products on machine translation, making great progress in Chinese-English translation. Figure 2 shows the performance of artificial intelligence in natural language processing. Artificial intelligence has also made great progress in the direction of language processing, especially in machine translation. Its accuracy has also been greatly improved, such as Siri, Voice Search, and Echo. A big breakthrough can achieve the exchange of different languages and the

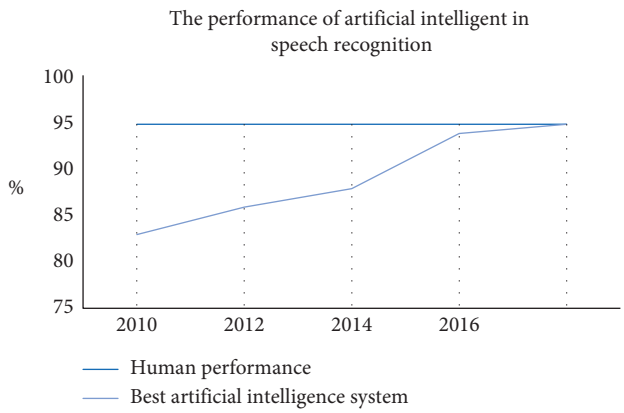

Figure 2: The performance of artificial intelligence in speech recognition.

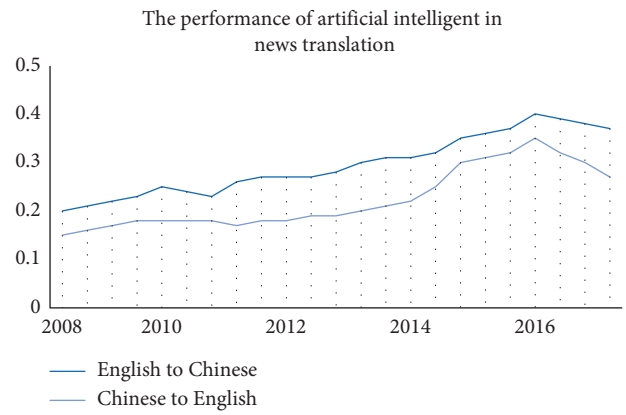

Figure 3: The performance of artificial intelligence in news translation.

conversion of speech to another language to a certain extent. In October 2016, Microsoft Research in the United States achieved significant breakthroughs in speech recognition technology. This is the first time that artificial intelligence speech recognition has been adjacent to humans. It has achieved an error rate of only 5.9 percent across the era. Figure 1 shows the performance of artificial intelligence in speech recognition in 2010 (Figure 2).

Figure 3 shows the performance of artificial intelligence in news translation.

Figures 3 and 4 show the performance of artificial intelligence in sentence translation and news translation, respectively. From Figure 4, the bilingual translation quality of BLEU, an automatic machine evaluation method, can be seen.

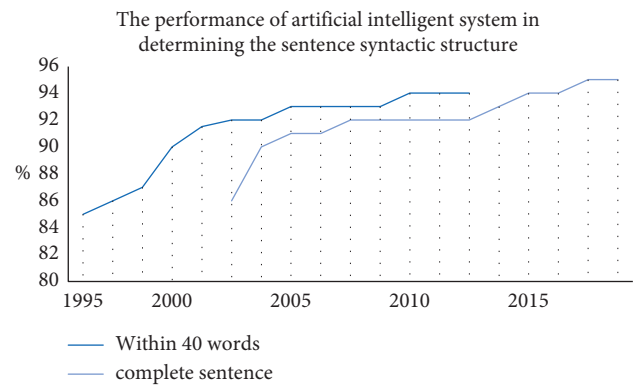

Figure 4: Performance of the artificial intelligence system in determining the sentence syntax structure task.

3.2. Business Applications. Major Internet giants at home and abroad are constantly expanding the market for artificial intelligence translation and developing commercial applications for artificial intelligence translation. In particular, the online translation tools provided by major companies are widely used in the market, and the development of the language translation service market is in full swing. Some companies have shut down the artificial intelligence translation engine due to huge market demand, and instead offer paid translation services.

At the same time, AI translators have become the most popular commercial products for artificial intelligence languages and translations. After Microsoft and Google successively launched their own translation machines, domestic NetEase, Sogou, Tencent, Keda Xunfei, and Split Tower Technology also gradually launched their own translation machines. At present, the AI translator has achieved good sales performance, the market prospect is promising, the function is powerful, and the language translation recognition is more precise and intelligent. Consider Keda Xunfei Company as an example: the company launched the Xunfei Translator 2.0, which not only supports Chinese and English, Japanese, Korean, and other 33 languages for simultaneous translation but also supports Cantonese, Sichuan, Henan, and other dialect translations. At the same time, it also has photo translation and is equipped with 4G, WIFI, offline translation, and other modes, and the English translation level can reach CET-6 level.

4. The Prospect of Intelligent Translation

4.1. Prospects of Artificial Intelligence Translation Technology. Before introducing technologies such as deep learning, artificial intelligence took 50 years to get the machine to have initial intelligence, and in 2006, Professor Jeffrey Sinton of the University of Toronto in Canada proposed the concept of deep learning and applied the technology to make computers. It took 6 years to identify the cat. The Alpha Go Zero software, also developed by deep learning technology, can evolve through self-learning, and it takes only 3 days.

4.2. Prospects for the Application of Artificial Intelligence Translation Market. With the development of the globalization of the world economy and economy, the exchanges between people of all countries have become more frequent and frequent.

4.3. Impact on the Current Artificial Language Translation Market. The range of artificial intelligence has been continuously expanded and strengthened. At present, the market price of Chinese-English translation is 200 yuan for 1,000 words. Within the professional and Chinese-English translation, only 200 yuan is in the early stages. In addition to advanced translation, human translation may be difficult to find a job.

5. Data Source

The sample from this article comes from 13689 basic Chinese and English syntax collected from the Internet. The test set used in this paper is a random extraction of 200 out of 13689 data. The resources used include 167,318 data partition tables, 633 data key tables, and 27 data pattern tables. The recall rate and F value of the word segmentation were tested and compared with ICTCLAS. The results are shown in Table 1.

In this paper, 13689 data are randomly divided into three parts, which are the training set (10166 sentences), the development set (1300 sentences), the test set (2223 sentences), and the training four-dimensional language model using SRILM tools. This paper conducted three sets of experiments. The first group uses ICTCLA to segment words and decode them using a common hierarchical phrase decoding model. The second group decodes it using a generic hierarchical phrase-based decoding model. The third group uses the proposed method and unit division method to decode it. The decoding uses a dictionary-level phrase model and a manual template. The dictionary contains 9555 entries and the manual template contains 495 templates. The BLEU score is used as an evaluation index for translation results. The results are shown in Table 2.

6. Results and Discussion

6.1. Data Analysis. It can be seen from Table 1 that the recall value of ICTCLA is 68.23%, and the recall value of this research method is 95.74%. It can be seen from the above results that the method is more accurate than ICTCLA, and the extraction rules are better, which improves the translation quality and remote sorting ability of sentences.

This article analyzes inaccurate examples of translation and finds that there are mainly the following types of errors:

(1) Different semantic environments

Chinese: White lie
Reference answer: White lie
Translation results: kind lie

(2) Lenovo is different

Chinese: like a duck to water
Reference answer: like a duck to water
Translation results: like fish to water

(3) Differences in aesthetic form

English: you are a lucky dog
Reference answer: you are a lucky one
Translation results: you are a lucky dog

Table 1: Word segmentation module test results.

	Correct rate (%)	Recall value (%)	F value (%)
ICTCLAS	76.40	68.23	72.09
Method of this paper	94.58	95.74	95.15

Table 2: Translation module test results.

	Development set/test set
ICTCLAS	0.7038/0.7132
Method of this paper	0.7444/0.7521
Method + unit division	0.7626/0,7730

Before training, we first need to configure some hyperparameters in the neural network. The main parameters are shown in Table 3.

The model size before and after model memory optimization is calculated. Then, the statistical results before and after optimization are shown in Table 4.

From the data in Table 4, it can be seen that the storage before optimization increases with the increase of the vector dimension, from 4.01 GB to 36.93 GB. The optimal model is chosen to adjust the parameters, so the data set is smaller. The data set is organized as shown in Table 5.

From the data in Table 5, it can be seen that the scale of the training set is 500, the scale of the validation set is 2, and the scale of the test set is 1. Based on the principle of conducting comparative experiments on different network models, in addition to setting the network model as a changing condition, the hardware and software environment and other experimental parameter settings are all set to constant conditions. Some parameter settings are shown in Table 6.

6.2. Intelligent Translation System Results Example. Figure 5 is the home page of the intelligent translation system, in which it automatically detects the Chinese and English locale by default (manually select the desired locale) and enters the statement to be translated in the text box, and the system automatically displays the translation result to the right. In the side frame, manually select the locale and click the desired locale directly, as shown in Figure 6.

Through the English translation in Figure 6, we can observe that the translation system can be accurately placed in the academic sentence translation, so that the system can also be introduced to have good performance in ordinary translation.

In Figure 7, the translation system has translated excerpts from Zhu Ziqing's famous prose "Hurry up". Taking literary works as the reference of the translation system greatly improves the standards and requirements of the translation system and reflects the translation quality of the system. According to the translation results of Figure 7, the system also has good performance in the middle of the English translation.

Table 3: The main parameters.

Parameter	Parameter meaning
Reload_ = True	Whether to reload the model and save the model at intervals
Dim word = 512	Prevent abnormal programme interruption
dim = 1024	Word vector dimension
Decay_ $c = 0$	Hidden state size

Table 4: Statistical results before and after optimization.

Word vector dimension	Before optimization (GB)	After optimization (GB)
128	4.01	0.16
256	14.03	0.39
512	20.61	0.78
1024	36.93	1.60

Table 5: Organization of the data set.

Data set settings	Scale/thousand lines	Quantity/group
Training set	500	1
Validation set	2	2
Test set	1	1

Table 6: Some parameter settings.

Parameter type	Parameter
Vocabulary size	8000
Word vector dimension	512
Batch size	1024
Number of network layers	6
Dropout	0.2

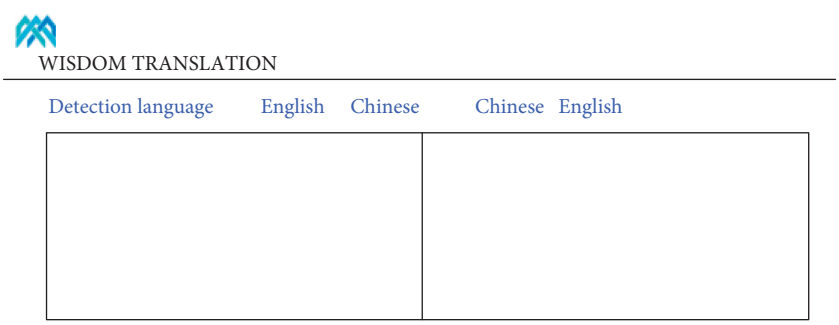

Figure 5: Intelligent translation system home page.

Finally, by example, the system has excellent translation performance and intuitive and accurate translation. In order to further enrich the corpus, it can also provide users with a very convenient interface, which is convenient for users to submit the correct results of their translations to the background administrator for verification. This also follows the idea of translation memory and greatly expands the source of the corpus.

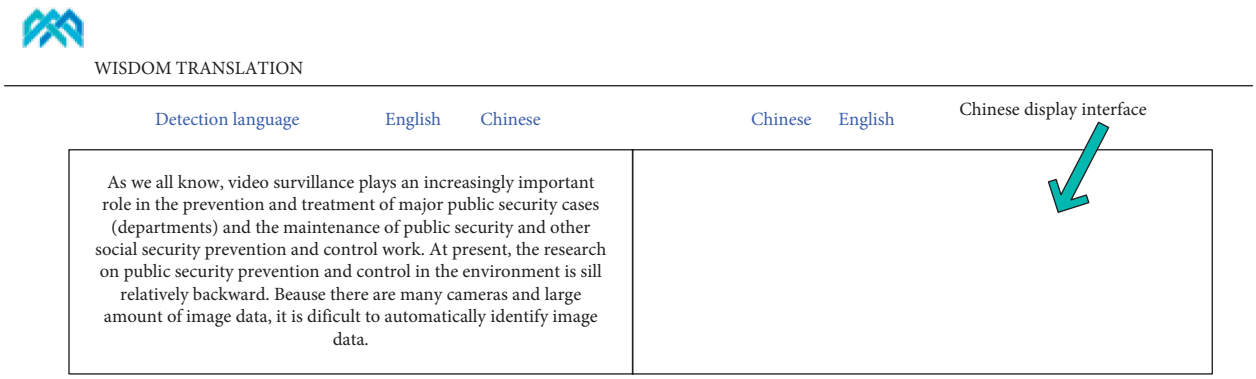

Figure 6: Results shown in the intelligent translation system.

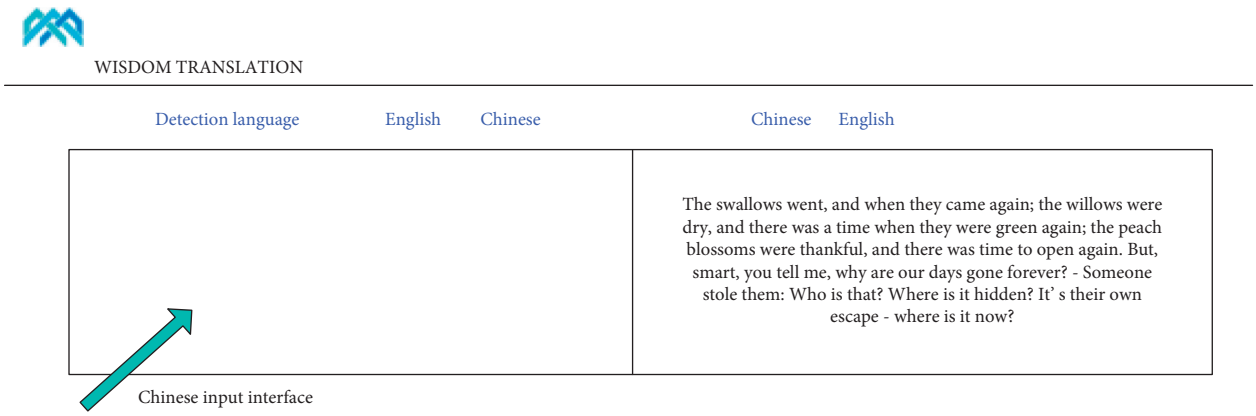

Figure 7: Translation system: translation of Chinese into English.

7. Conclusion

Several major advantages of statistical machine translation, such as no manual intervention and short development cycle, have made this research development very rapid in the past two decades, especially in many specific fields to meet the needs of various social life. Foreign companies such as Google and Microsoft, domestic Baidu, NetEase Youdao, and other Internet companies have provided users with free online multilanguage translation systems [22, 24, 25]. However, each company's main language translation direction is different. For example, Google mainly targets multilingual translation centered on English, and Baidu mainly targets multilingual translation centered on English and Chinese. We cannot deny that machine translation has become more and more important in our lives. At present, in most cases, the results of machine translation are only to help users understand the general meaning of the original text to a certain extent, and the translation results cannot be directly published as a smooth translation. If you want to further obtain a completely correct translation, you still need to professional translators make corrections. With the harmonious development of international relations, exchanges and cooperation projects between countries are increasing. English is one of the commonly used languages in the world. Chinese-English translation is the focus of academic theory research [22, 26–28]. The design of the translation system includes four modules: preprocessing, feature extraction, image segmentation, and classifier design. The feature extraction part is the most important. A small number of translation dictionaries and artificial templates are added to the hierarchical phrase model. Translate the units and then glue the results together in the reverse order to form the final translation [29–31]. Experiments show that the translation system designed in this paper has better performance than the traditional intelligent translation system, and it tries to eliminate differences as much as possible and consider ways to automatically obtain keywords, patterns, and translation dictionaries, extending our existing resources [32, 33].

Data Availability

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

Conflicts of Interest

The authors declare that there are no conflicts of interest.

Acknowledgments

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References

[1] Q. Qi, "Discussion on the influence and suggestion of artificial intelligence on the translation industry," *Modern Trade and Industry*, vol. 40, no. 9, pp. 178-179, 2019.

[2] Y. Wang, "Research on the application status and prospect of artificial intelligence in language service industry," *Southern Review Series*, no. 5, pp. 22-23, 2018.

[3] H. Choi, K. Cho, and Y. Bengio, "Context-dependent word representation for neural machine translation," *Computer Speech & Language*, vol. 45, pp. 149–160, 2017.

[4] F. Zhang, "English machine translation model based on modern intelligent recognition technology," *Modern Electronic Technology*, vol. 41, no. 16, pp. 151–154, 2018.

[5] R. Zhao and D. Tang, "The application advantages of intelligent translation in the context of global economics," *Neijiang Science and Technology*, vol. 39, no. 7, pp. 117-118, 2018.

[6] Liang, "Construction of Liangya auxiliary translation learning system," *Automation and Instrumentation*, no. 8, pp. 142–144, 2018.

[7] X. Lu, *Exploring Artificial Intelligence Translation from the Perspective of Discourse Translation*, Beijing Foreign Studies University, Beijing, China, 2018.

[8] Y. Liu, "Analysis of the application and development of artificial intelligence in the language service industry from the generation of artificial intelligence translation," *China Strategic Emerging Industries*, no. 4, pp. 153-154, 2018.

[9] X. Li, H. Liu, W. Wang, Y. Zheng, H. Lv, and Z. Lv, "Big data analysis of the internet of things in the digital twins of smart city based on deep learning," *Future Generation Computer Systems*, vol. 128, pp. 167–177, 2022.

[10] H. Song and M. Brandt-Pearce, "A 2-D discrete-time model of physical impairments in wavelength-division multiplexing systems," *Journal of Lightwave Technology*, vol. 30, no. 5, pp. 713–726, 2012.

[11] M. Adil, M. K. Khan, M. Jamjoom, and A. Farouk, "MHADBOR: AI-enabled administrative-distance-based opportunistic load balancing scheme for an agriculture internet of things network," *IEEE Micro*, vol. 42, no. 1, pp. 41–50, 2022.

[12] M. Adil, M. A. Jan, S. Mastorakis et al., "Hash-MAC-DSDV: mutual authentication for intelligent IoT-based cyber-physical systems," *IEEE Internet of Things Journal*, 2021.

[13] M. Adil, H. Song, J. Ali et al., "EnhancedAODV: a robust three phase priority-based traffic load balancing scheme for internet of things," *IEEE Internet of Things Journal*, 2021.

[14] F. Zhu, C. Zhang, Z. Zheng, and A. Farouk, "Practical network coding technologies and softwarization in wireless networks," *IEEE Internet of Things Journal*, vol. 8, no. 7, pp. 5211–5218, 2021.

[15] X. Yin, Y. Kang, C. Jin, and J. Du, "Development of man-machine interface for agricultural machinery automatic navigation system," *Agricultural engineering technology*, vol. 38, no. 18, pp. 79–82, 2018.

[16] J. Bao, "Design and development of man-machine interface for electric heating water heater," *Electronic Technology and Software Engineering*, no. 18, pp. 40–42, 2018.

[17] X. Xu, "Research on the development trend of human-machine interface under the guidance of artificial intelligence," *Industrial Design*, no. 2, pp. 137-138, 2019.

[18] W. Lu, R. Tan, G. Liu, and H. Sun, "A small language machine translation algorithm based on semi-supervised learning," *Journal of Xiamen University*, vol. 58, no. 2, pp. 200–208, 2019.

[19] K.-C. Rim, P.-K. Kim, H. Ko, K. Bae, and T.-G. Kwon, "Restoration of dimensions for ancient drawing recognition," *Electronics*, vol. 10, no. 18, 2021.

[20] Y. Jiang, K.-K. R. Choo, and H. Ko, "A special section on deep & advanced machine learning approaches for human behavior analysis," *Journal of information processing systems*, vol. 17, no. 2, pp. 334–336, 2021.

[21] S. N. Alsubari, S. N. Deshmukh, A. A. Alqarni, and N. Alsharif, "Data analytics for the identification of fake reviews using supervised learning," *CMC-Computers, Materials & Continua*, vol. 70, no. 2, pp. 3189–3204, 2022.

[22] H. Zhu, H. wei, B. Li, X. Yuan, and N. Kehtarnavaz, "Real-time moving object detection in high resolution video sensing," *Sensors*, vol. 20, no. 12, 2020.

[23] J. Zhou, "Research on simultaneous interpretation based on C#," *Modern Business and Trade*, vol. 40, no. 12, pp. 182-183, 2019.

[24] M. Chinea-Rios, G. Sanchis-Trilles, and F. Casacuberta, "Vector sentences representation for data selection in statisticalmachine translation," *Computer Speech & Language*, vol. 56, 2019.

[25] M. Esplà-Gomis, F. Sánchez-Martínez, and M. L. Forcada, "Predicting insertion positions in word-level machine translation quality estimation," *Applied Soft Computing*, vol. 76, pp. 174–192, 2019.

[26] W. Li, C. Ji, X. Ning, D. Li, and G. Mei, "Research on intelligent translation algorithm of German compound words based on machine learning," *Electronic world*, no. 5, pp. 62–65, 2019.

[27] G. Xiao, Q. Cheng, and C. Zhang, "Detecting travel modes using rule-based classification system and Gaussian process classifier," *IEEE Access*, vol. 7, Article ID 116741, 2019.

[28] Y. Li, Y. Zuo, H. Song, and Z. Lv, "Deep learning in security of internet of things," *IEEE Internet of Things Journal*, no. 99, p. 1, 2021.

[29] Y. Bi and B. Jiang, "Research on the calculation method of Korean sentence structure similarity," *Chinese Journal of Information Science*, vol. 33, no. 3, pp. 59–63+101, 2019.

[30] D. Banik, A. Ekbal, P. Bhattacharyya, and S. Bhattacharyya, "Assembling translations from multi-engine machine translation outputs," *Applied Soft Computing Journal*, vol. 78, pp. 230–239, 2019.

[31] W. Zhang, "The principles and methods of Chinese and English lyrics translation under the difference of Chinese and western cultures," *Education Modernization*, vol. 5, no. 5, pp. 308-309+316, 2018.

[32] F. Tan, "Analysis of the processing of cultural imagery in Chinese-English idioms translation," *Art Science and Technology*, vol. 30, no. 9, 2017.

[33] X. Wang, X. Wang, and H. Ma, "Chinese-English translation problems and countermeasures of propaganda materials," *Science and Technology*, no. 36, 2018.