

Retraction

Retracted: The Application of Artificial Intelligence in the Dissemination of Local Culture in Hainan Province: Taking the Dissemination of Bai Yuchan's Thoughts as an Example

Advances in Multimedia

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1].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] Y. Yu and H. Wang, "The Application of Artificial Intelligence in the Dissemination of Local Culture in Hainan Province: Taking the Dissemination of Bai Yuchan's Thoughts as an Example," *Advances in Multimedia*, vol. 2022, Article ID 7255853, 10 pages, 2022.

Research Article

The Application of Artificial Intelligence in the Dissemination of Local Culture in Hainan Province: Taking the Dissemination of Bai Yuchan's Thoughts as an Example

Yuxiu Yu  and Honghai Wang

School of Foreign Languages, University of Sanya, Sanya 572000, China

Correspondence should be addressed to Yuxiu Yu; 14520184@zyz.edu.cn

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Bai Yuchan's Taoist thought is an important part of Taoist health-preserving thought. Excavating, sorting out, and translating Bai Yuchan's Taoist thought will not only help increase cultural self-confidence and protect traditional culture but also become an important medium for foreign exchanges. With the advent of the digital age, artificial intelligence has helped the dissemination of excellent traditional Chinese culture with its unique technological advantages, improving the effectiveness, intensity, and breadth of cultural dissemination. In domain machine translation, whether domain terms can be correctly translated plays a decisive role in the translation quality. It is of practical significance to effectively integrate domain terms into neural machine translation models and improve the translation quality of domain terms. This paper proposes a method of incorporating new Bai Yuchan's thought term information as prior knowledge into neural machine translation. Using the term dictionary constructed from Bai Yuchan's thought bilingual terminology knowledge base as a medium, two different knowledge integration methods are proposed and compared: (1) term replacement, which means using the target term to replace the source term on the source language side, and (2) term addition, which means splicing the source term and the target term on the source language side and both the source language side and the target language side. Use identifiers as special external knowledge to identify the beginning and end of the target term. Based on the Chinese-English bilingual alignment corpus of New Bai Yuchan's thoughts and the constructed Chinese-English alignment termbase, the experiments are carried out. The results show that on the test set, the BLEU value of the proposed method is 6.38 and 6.38 higher than the baseline experiments, respectively, which proves that the proposed method can effectively incorporate domain terminology knowledge into the translation model and improve the translation quality of domain terminology.

1. Introduction

Culture is the soul of a country and a nation. President Xi pointed out that to carry forward the excellent traditional Chinese culture, we must properly handle the relationship between inheritance and creative development and focus on creative transformation and innovative development [1]. Driven by new theories and new technologies, the rapid development of artificial intelligence technology has promoted the innovative dissemination of Chinese excellent traditional culture [2]. How to apply artificial intelligence,

perfectly integrate core value content and technical elements, and promote the inheritance and innovation of Chinese excellent traditional culture and how to give Chinese excellent traditional culture a precise expression, accurately display Chinese culture to the world, and spread Chinese voices are urgently needed solutions in the new era [3]. Artificial intelligence technology integrates core value content and modern aesthetic elements, giving Chinese traditional culture strong vitality [4]. With the development of high technology, artificial intelligence has subtly integrated Chinese traditional culture into people's daily life in various

forms of expression, improving the effectiveness of communication .

There are two ways to translate and introduce Bai Yuchan's Taoist health-preserving thoughts: one is to translate his works, and the translation method should be selected according to the characteristics of the text. The other is official and nongovernmental communication, the main body of communication should be expanded, and the power of new media should be used. Artificial intelligence can easily use the languages and dialects of different countries to communicate with audiences through translation technology and speech recognition technology, breaking the barriers of cross-language, cross-regional, and cross-cultural communication and promoting Chinese excellent traditional culture to the world [5]. Taking Dunhuang as an example, the artificial intelligence guide "Dunhuang Xiaobing" has thoroughly familiarized the thousands of pages of "Dunhuang Dictionary of Learning" by heart and uses different languages to chat to tourists about Dunhuang culture, history, geography, and other knowledge. In the digital age, technologies represented by artificial intelligence play a pivotal role in the dissemination process [6]. As a rational and objective representative, although artificial intelligence robots have knowledge reserves beyond the human brain, they cannot truly simulate human emotions and cannot resonate with the audience [7, 8]. Due to the constraints of technical factors such as coding, although the communication efficiency of robots is high, it cannot spread the cultural content with real warmth, emotion, and depth. The connotation interpretation is not deep enough, and the communication effect is not ideal. In some occasions that require complex human-computer interaction, artificial intelligence robots generally have the phenomenon of delay, unresponsiveness, and answers that are not asked [9, 10]. The overly stereotyped communication method has not really aroused the audience's interest in traditional culture but also reduced the aesthetic charm of traditional culture itself, losing its due temperature and vitality. Therefore, how to avoid the patterned dissemination of artificial intelligence and inject the temperature, depth, and height of traditional culture into artificial intelligence technology is an urgent problem to be solved [11].

Machine translation refers to the process of translating source language sentences into semantically equivalent target language sentences through computers. It is an important research direction in the field of natural language processing. "Deep learning technology" refers to using the learning ability of artificial intelligence to automatically recognize text, images, and sound data, so that machines can learn by themselves. In the process of translation, the terminology information of a specific domain is incorporated into the neural machine translation model as prior knowledge, and improving the translation effect of domain terms has always been a hot issue in neural machine translation research. In recent years, with the development of multiculturalism, some young people believe that traditional culture "can't keep up with the trend," and there is a misunderstanding of traditional culture, which leads to a narrow audience of traditional culture and affects innovation and

development to a certain extent [12]. To this end, we urgently need to use artificial intelligence technology represented by "deep learning technology" to continuously inject elements of the times into traditional culture and use the songs and dances, film, and television works that young people like to interpret the profound connotation of traditional culture and provide traditional culture. The deep inner core is wrapped in the coat of the era [13, 14]. This can not only stimulate the interest of contemporary young people to deeply explore traditional culture and promote the integration and development of traditional culture and modern society but also realize the inheritance and innovation of traditional culture [15].

Inner alchemy is relatively esoteric and difficult to understand, and it is very difficult to practice. Within Taoism, there are not many people who have truly cultivated the Dao. For overseas people, it is even more difficult to practice when they overcome language and cultural barriers. The translation and introduction of Bai Yuchan's Taoist health-preserving thoughts is an important part of the promotion of Chinese culture, mainly through the following two ways: first, the translation of Bai Yuchan's works, and second, the official and private dissemination of Bai Yuchan's thoughts and deeds. In addition to following the general principles of Taoist translation, the translation of Bai Yuchan's works should also choose appropriate translation methods according to its own text characteristics. In addition to the instructive expositions on cultivation, his writings also contain more than a thousand poems, with themes related to the beautiful scenery of the wind and moon, cultivation insights, and singing of immortal ancestors. When translating the instructive discourse on cultivation practice, because the Taoist vocabulary used by Bai Yuchan has the characteristics of metaphor and nonspecificity, and most of the vocabulary corresponding to the cultural connotation cannot be found in American culture, the literal translation plus annotation method, transliteration plus annotation method, can be used. Taking the sixth jue "Slow Fire" of "Dan Fa Shen Tong 19 Jue" as an example, the word itself has the meaning of decoction, small fire, and slow simmering when stewing soup, which is used as a metaphor for "no mind during the training process." When continuous gentle breathing is used in meditation, Bai Yuchan said that his state is "warm and warm, and it is continuous." Therefore, it can be translated as follows: simmering fire, which refers to soft, slow, and continuous breath during meditation without the guidance of mind. When translating poems, different translation methods should be adopted according to different categories to fully convey their aesthetic connotations.

2. The Research Background and Technical Solutions

2.1. The Introduction of Bai Yuchan and His Thought. Bai Yuchan is one of the five patriarchs of the Southern Sect, and his Taoist health-preserving thought is based on the full integration and sublimation of the three schools of thought, Confucianism, Buddhism, and Taoism. The quintessence of

Bai Yuchan's Taoist health-preserving thought is mainly reflected in three aspects, namely, inner alchemy health-preserving, elegant interest health-preserving, and diet health-preserving.

Bai Yuchan's Taoist health-preserving thought is an important part of Chinese Taoist health-preserving thought. It is a sublimation on the basis of inheriting Confucianism and Taoism's health-preserving thought and can meet the needs of modern medical development, government health care work, and personal health preservation. Therefore, it is necessary to carry out the translation and introduction of Bai Yuchan's Taoist health care thought. Modern medicine inherits the wisdom of the ancients and puts health in the first place. "Practicing work to treat illnesses, medicine will focus on health care, so that everyone's life will be more pleasant, comfortable and unrestrained." Compared with the translation and introduction of the thoughts of nourishing the heart and diet, the difficulties in the translation and introduction of the thoughts of Bai Yuchan's Nei Dan are mainly manifested in the following aspects. Firstly, the inner alchemy technique is relatively esoteric and difficult to understand, and it is very difficult to practice. There are not many people who have truly cultivated the Dao. Second, Taoists are indifferent to fame and fortune and advocate quietness and inaction. Taoists who have cultivated the Dao are less devoted to explaining the profound and difficult theories and cultivation methods of inner alchemy in simple language or explaining the practice of inner alchemy in simple language. Nowadays, the most widely circulated overseas are Taijiquan, Wuqinxi, and Baduanjin, which are highly practical and relatively simple health-preserving exercises. Some scholars believe that "so far, no individual or organization has been engaged in the promotion of Taoist Neidan health care."

Bai Yuchan's Taoist health-preserving thought is an important part of Taoist health-preserving thought. Excavating, sorting out, and translating Bai Yuchan's Taoist health-preserving thought will not only help increase cultural self-confidence and protect traditional culture but also become an important medium for foreign exchanges. Translators shoulder the heavy responsibility of cultural promotion and require high professional quality. They must not only be influenced by Chinese culture but also familiar with the context of Western culture and become a bridge between Chinese and Western cultures. In the process of translation, the translator needs to have a high degree of retention of the cultural information of Bai Yuchan's thoughts and do a lot of textual research work. It is impossible without a professional, scientific, and realistic research spirit. In addition, translators need strong basic language skills and the accumulation of traditional Chinese culture. They need multiple background knowledge such as linguistics, history, sociology, and philosophy and can better express Bai Yuchan's thought and the text information and culture in his works. To present the whole picture of Bai Yuchan's thought and his works as much as possible, so that the target language readers can deeply understand the traditional cultural essence of Chinese Taoism, health preservation thought, philosophy, and aesthetics, so as to truly improve the accep-

tance of the translated work in the target language countries and regions. Make due contributions to the dissemination of Hainan local culture and traditional Chinese culture. They should not only have the accumulation of traditional Chinese culture, good foreign language literacy, and translation ability but also have the enthusiasm for translating and introducing Chinese cultural classics and disseminating Chinese culture. Understand Bai Yuchan's works at a level and highlight the humanistic value and cultural heritage of philosophy, aesthetics, and Taoist health-preserving thoughts in his works. In the official and nongovernmental communication of Bai Yuchan's thoughts and deeds, the main focus should be on expanding the subjects and objects of external communication, promoting the diversification of external communication channels, and adapting to the needs of external communication objects.

In addition to following the general principles of Taoist translation, the translation of Bai Yuchan's works should also choose appropriate translation methods according to its own text characteristics. In addition to the instructive expositions on cultivation, his writings also contain more than a thousand poems on topics such as the scenery of the wind and the moon, cultivation insights, and singing of immortal ancestors. When translating the instructive discourse on cultivation practice, the Taoist vocabulary used by Bai Yuchan has the characteristics of metaphor and non-specificity, and most of the vocabulary corresponding to the cultural connotation cannot be found in American culture.

2.2. Neural Machine Translation System Based on Transformer. In terms of promoting the diversification of external communication channels, we should realize that the single paper media in the past has been far from meeting the needs. For example, Wechat international version official account, Weibo international version, Facebook, Tencent video and other software have expanded external communication channels. Transformer is a classic model based on attention mechanism proposed by Google team in 2017. This model abandons the sequential structure of traditional recurrent neural network, uses self-attention mechanism, and performs parallel training on the basis of global information. Best quality and translation speed. Therefore, this paper selects Transformer to conduct experiments on the translation model [16]. The Transformer model adopts a sequence-to-sequence model architecture, and the overall structure consists of two parts: an encoder and a decoder [17]. The encoder of the model encodes the source language and converts it into a vector representation, and the decoder receives the encoding information from the encoder and then decodes it to generate a translation. The overall structure of Transformer is shown in Figure 1.

In addition to following the general principles of Taoist translation, the translation of Bai Yuchan's works should also choose appropriate translation methods according to its own text characteristics. In addition to the instructive expositions on cultivation, his works also contain more than a thousand poems on topics such as the beautiful scenery of the wind and the moon, cultivation insights, and singing of immortal ancestors. The encoder consists of 6 identical layer

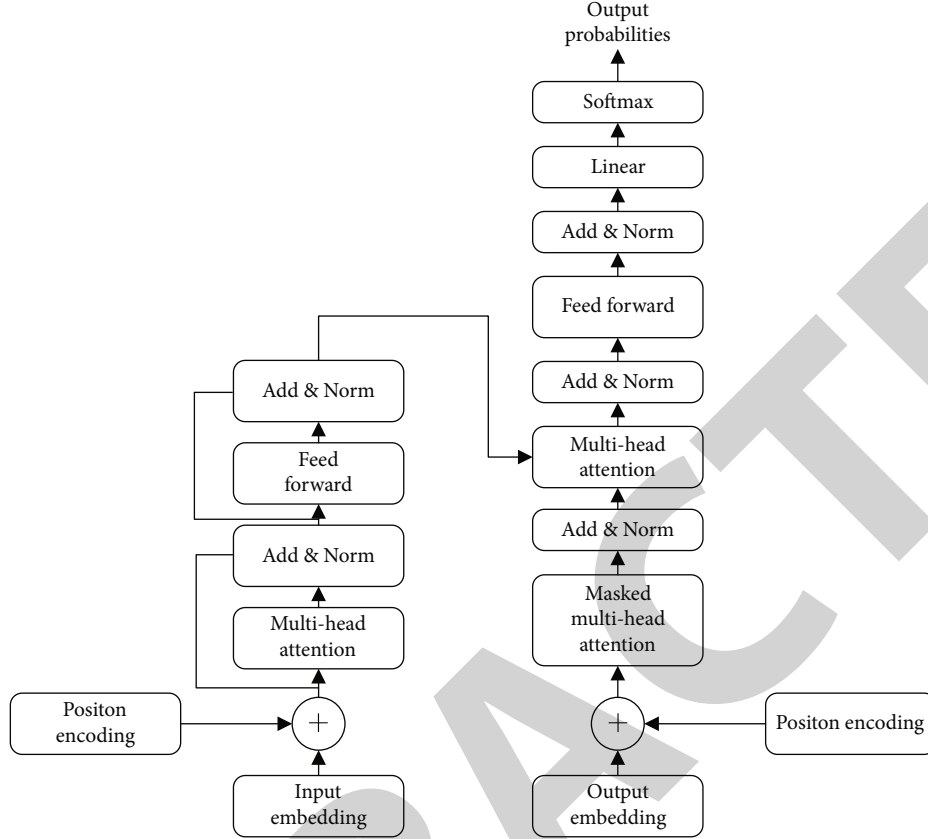


FIGURE 1: Transformer structure.

stacks, each of which contains a multihead attention sub-layer and a feed-forward neural network sub-layer, which are connected by residual connections and layers [18, 19]. Transformer uses positional encoding to save the position of words in the sequence to identify the order relationship in the language. The calculation formula of positional encoding PE is shown in

$$\begin{aligned} PE_{(\text{pos}, 2i)} &= \sin\left(\frac{\text{pos}}{10000^{2i/d}}\right), \\ PE_{(\text{pos}, 2i+1)} &= \cos\left(\frac{\text{pos}}{10000^{2i/d}}\right), \end{aligned} \quad (1)$$

where pos represents the position of the word in the sentence, d represents the dimension of the position embedding, and i represents the dimension number of the word vector. For the input source sentence X , the vector representation of all words in the sentence is obtained by adding the word embedding vector and the position encoding, as shown in

$$X_{\text{Embedding}} = \text{Word Embedding}(X) + \text{Positional Encoding}(X). \quad (2)$$

The three linear transformation matrices W^Q , W^K , and W^V in the attention sub-layer, respectively, perform three linear transformations on the input vector representation and derive the query matrix Q , the key matrix K , and the value matrix V and further obtain the attention of X , which are shown in

$$\begin{aligned} Q &= \text{Linear}(X_{\text{Embedding}}) = X_{\text{Embedding}} \cdot W^Q, \\ K &= \text{Linear}(X_{\text{Embedding}}) = X_{\text{Embedding}} \cdot W^K, \\ V &= \text{Linear}(X_{\text{Embedding}}) = X_{\text{Embedding}} \cdot W^V, \\ X_{\text{attention}} &= \text{Attention}(Q, K, V) = \text{Softmax}\left(\frac{QK^T}{\sqrt{d_k}}\right)V. \end{aligned} \quad (3)$$

The linear transformation matrices (W^Q , W^K , W^V) in the self-attention layer are defined as multiple group, namely, (W_0^Q, W_0^K, W_0^V) and (W_1^Q, W_1^K, W_1^V), multiple sets of attention vectors are obtained after calculation, and the multiple sets of attention vectors are spliced and input into the feedforward neural network after residual connection and layer

normalization [20]. The specific calculation formulas are shown in

$$Z_i = \text{head}_i = \text{Attention}(QW_i^Q, KW_i^K, WW_i^V), \quad i = 1, \dots, 8,$$

$$Z = \text{Multihead}(Q, K, V) = \text{Concat}(Z_1, Z_2, \dots, Z_8)W^0. \quad (4)$$

The feedforward neural network consists of two fully connected network sublayers. The first layer uses the RELU function as the activation function, and the second layer is the linear activation function, as shown in

$$\text{FFN}(Z) = \max(0, ZW_1 + b_1)W_2 + b_2, \quad (5)$$

where b_1 , b_2 , W_1 , and W_2 are model parameters.

Similar to the encoder, the decoder also consists of a stack of 6 identical layers, and each layer of the decoder consists of two multihead attention sublayers and a feedforward neural network sublayer. The first multihead attention sublayer adopts the masked operation, called masked multihead attention, which is used to hide the information of the next order when translating the current order [21]. The K and V matrices of the second multihead attention sublayer come from the encoded information matrix of the encoder, while the Q matrix uses the output of the previous multihead attention layer in the decoder. Residual connections and layer normalization are performed at each sublayer.

3. Domain Machine Translation Incorporating Terminology Knowledge

3.1. Experimental Data. This paper studies domain machine translation based on the bilingual alignment corpus of the new Bai Yuchan thought and the constructed bilingual terminology knowledge base. The bilingual aligned corpus Pat_Corpus is constructed from the actionable patent website, a patent data search engine. The size of the Chinese corpus is 17.5 MB, and the size of the English corpus is 26.1 MB. The two corpora contain a total of 116,095 pairs of Chinese-English bilingual alignment sentences. Table 1 lists examples of Chinese and English patent sentence pairs of Bai Yuchan's thought.

The term knowledge base uses deep learning technology to build a neural network to extract terms from Chinese patent texts and translates Chinese terms through WIPO to obtain corresponding English terms. Each corpus contains a total of 39,861 pairs of Chinese and English terms. Table 2 lists examples of Chinese and English patent term pairs in Bai Yuchan's thought.

The Pat_Corpus is divided into training set, validation set, and test set according to the ratio of 8 : 1 : 1.

3.2. Experimental Procedure. In this experiment, Chinese data is used as the source language, and English data is used as the target language. For Chinese data, terminology information is incorporated into neural machine translation as prior knowledge using two different methods: terminology

replacement and terminology addition. Using jieba word segmentation tool and with the help of Chinese patent terminology database to guide word segmentation, the term information in Chinese patent data is effectively preserved [22]. It avoids the loss of term information caused by inaccurate word segmentation, which affects the translation effect of the term, and provides basic data for term replacement and term addition.

- (1) Term replacement: use the target term to replace the source term on the source language side, and use the symbols "<S>" and "<E>" to identify the target term. In this paper, this method is denoted as SE-Replace
- (2) Terminology addition: add the target term after the source term in the source language, and use the symbols "<S>" and "<E>" to identify the target term. In this paper, this method is denoted as SE-Append

For English data, the NLTK word segmentation tool is used for word segmentation, the terms in it are also identified, and the English data after word segmentation is standardized [23]. Source represents the source language, Segmentation represents the result of the term dictionary instructing word segmentation, SE-Replace represents the term replacement method proposed in this paper, and SE-Append represents the term addition method proposed in this paper. The domain term information is incorporated into neural machine translation as prior knowledge through term replacement and term addition, and the symbols "<S>" and "<E>" are used to identify the replacement and addition of target-side terms in the source language, respectively. The method of using term replacement enables the translation model to learn the semantic relationship between the target-side term and the source sentence during training [24, 25]. The method of term addition enables the model to learn more fully the correspondence between the source terminology and the target terminology during training, so as to further improve the accuracy of term translation results [26]. Taking a translation instance incorporating prior terminology knowledge in the new energy field as an example, the training process of the translation model is shown in Figure 2.

In order to verify the effectiveness of the proposed method, the following comparative experiments are designed in this paper.

- (1) Baseline: the source language does not carry any terminology information as prior knowledge, and the data that has only been guided by terminology segmentation in the new energy field is used as the baseline experimental data
- (2) Replace: replace only, use the target term to replace the source term. The source language carries the target term knowledge information and does not use any identifier to identify the source language component
- (3) Append: add only, splicing the destination term after the source term. The source language carries the

TABLE 1: Examples of Chinese and English sentences.

Chinese	English
Yi xi chun shui yang bi han, liu chu hong tao ji pian hong.	Above the emerald spring brook, chills rise; along with the water, peach blossom petals float.
Ri gao wu zhang shang han mian, xin xia wu chou bu guan tian.	When it is almost noon, I am in my dreamland lingering, whatever matters in this world is of no concern to me.
Zhen qian zhen gong cai ru shou, pian shi fu hu you qin long.	Once the true lead and mercury in your body are found, immediately the tiger and dragon are captured.

TABLE 2: Examples of Chinese and English sentences.

Chinese	English
Zuo wang lun	Treatise on sitting forgetting
Dan yang zhen ren yu lu	Saying of Taoist master Danyang
Zhi shang yu huang dai xi jing	The Taoist method of opening the Dan Tian

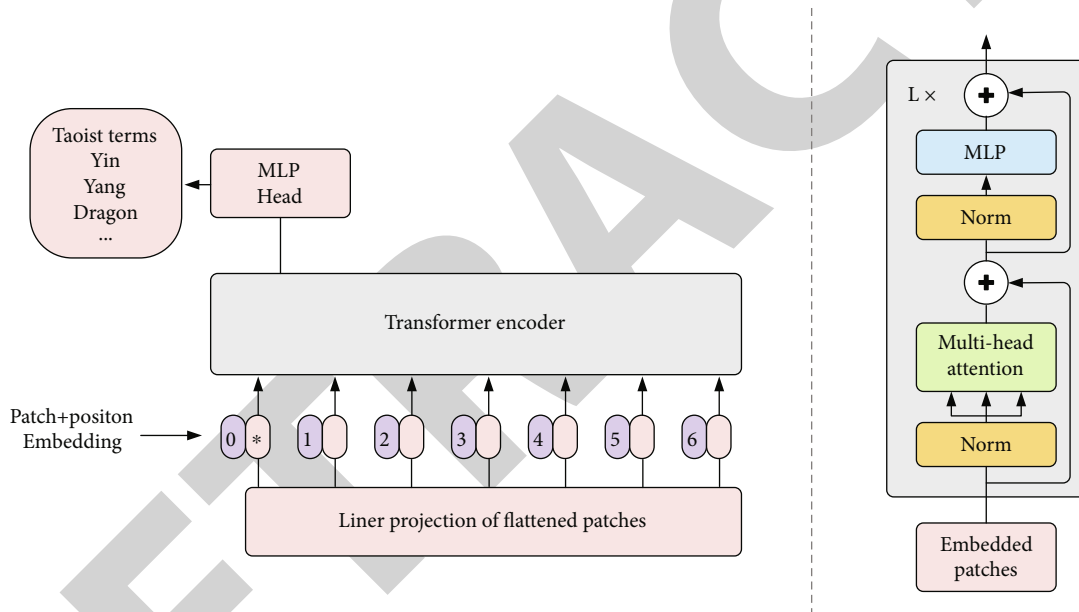


FIGURE 2: Model training process.

knowledge information of the source terminology and the target terminology, and no identifier is used to identify the language components in the source language

- (4) Sub-Replace: use the target term to replace the source term, the source language carries the knowledge information of the target term, learn from the ideas of Dinu and others, and use the identifier to identify the source language component, where the subscript 0 identifies the source language part, subscript 1 identifies the source term, and subscript 2 identifies the destination term
- (5) Sub-Append: concatenate the target term after the source term. The source language carries the knowledge information of the source terminology and the target terminology and uses the identifier to identify the components in the source language. The subscript 0 identifies the source language part, the subscript 1 identifies the source term, and the subscript 2 identifies the target term
- (6) SE-Replace: the term replacement method is proposed in this paper. On the source language side, use the target-side term to replace the source-side term, and use the symbols "<S>" and "<E>" to identify the target-side term
- (7) SE-Append: the term adding method is proposed in this paper. Add the target-side term after the source-language side and the source-side term, and use the symbols "<S>" and "<E>" to identify the target-side term

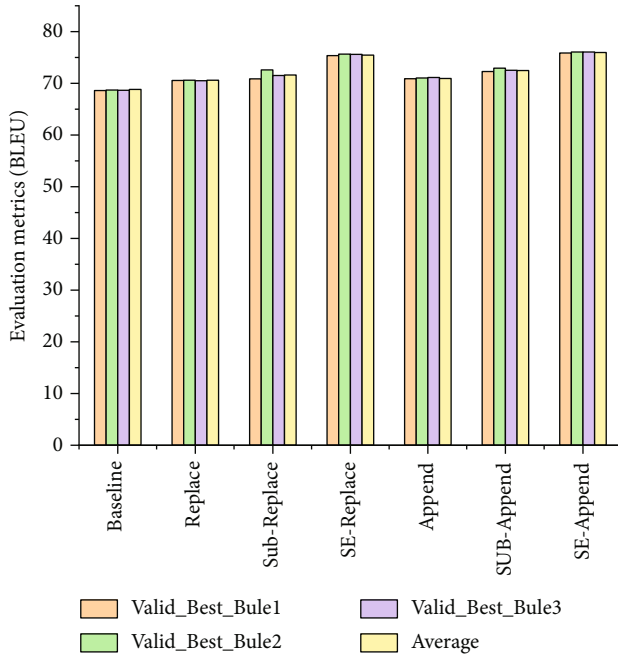


FIGURE 3: Validation set translation performance.

4. Result Analysis and Discussion

In order to better reflect the effectiveness of the proposed method, different random seeds are set when dividing the training set, the validation set, and the test set, and experiments are carried out multiple times according to the division ratio. The training rounds are set to 160, and the model training was taken the same hyperparameter settings; record the BLEU scores on the validation set and test set for each experiment, calculate the average, and use it as the final score.

In order to more intuitively show the performance of different methods, Figures 3 and 4 use the BLEU value as the ordinate to show the BLEU value and change trend of different methods on the validation set and test set.

The experimental results show that, compared with Baseline, the methods of Replace and Append, which carry prior terminology knowledge, both improve the translation performance. The mean value of using Replace’s method after 3 experiments obtains an improvement of 1.87 and 0.76 BLEU points on the validation set and the test set, respectively. After three experiments using the Append method, the mean value of the validation set and the test set was improved by 2.92 and 1.76 BLEU points, respectively. The Replace and Append methods verify the effectiveness of incorporating prior knowledge in neural machine translation, and incorporating prior terminology knowledge into the source can effectively improve the translation effect of neural machine translation.

Compared with the Replace and Append methods, the Sub-Replace and Sub-Append methods have further improved the translation performance. Compared with Replace, Sub-Replace improves by 1.09 and 1.33 BLEU points on validation set and test set, respectively. Compared

with Append, Sub-Append improves by 1.5 and 1.41 BLEU points on validation set and test set, respectively. The Sub-Replace and Sub-Append methods verify the effectiveness of using identifiers to identify sentence components in the source language to distinguish source terms from target terms based on incorporating term information as prior knowledge into neural machine translation.

The method in this paper directly replaces the source term with the target term, splices the target term information behind the source term, and uses the identifiers “<S>” and “<E>” to identify the beginning and end of the target term, respectively. This incorporates terminology information as prior knowledge and identifiers as additional information into neural machine translation models. In order to further compare the differences between term replacement and term addition at the source end, we carried out experimental analysis on Baseline, Append, Replace, Sub-Replace, Sub-Append, and the methods SE-Replace and SE-Append proposed in this paper. Figures 5 and 6, respectively, show the number of model iterations in the training process and the line graph after averaging BLEU for methods such as whether to incorporate terminology knowledge in the source language and how to identify it after incorporating terminology knowledge.

SE-Append has leveled off after 110 epochs of training. The reason may be that the target term is added after the source term, and more term knowledge is incorporated into the source language. As shown in Figures 5 and 6, the Transformer model tends to converge gradually during iterative training. Baseline, which has only been processed by common word segmentation, converges faster and becomes stable after 80 rounds of training. The reason may be the fixed expression of Bai Yuchan’s thoughts in Chinese and English patent texts and the strong learning ability of the Transformer model. The Transformer model learns the corresponding expressions of Chinese and English patent texts in a short period of time and thus tends to be stable in a relatively short period of time. From the experimental results, since there is no term information input as prior knowledge in the source language, the translation model cannot fully learn the correspondence between the source terminology and the target terminology during training and can only translate simple terms correctly. It is the difference between Chinese and English expressions and the use of multiple digital subscripts to identify sentence components in the source language, which causes knowledge confusion, increases the difficulty of learning translation models, and makes it difficult for neural networks to learn.

The addition of terms can retain the complete information and expression habits expressed in Chinese, enrich the expression information of the source terminology, and only identify the target terminology by identifiers in the source language and the target language, avoiding the confusion of knowledge caused by excessive identifiers. In order to visually show the effect of adding data of different scales on the Pearson correlation coefficient, this paper generates two sets of line graphs for comparison of the experimental results. Figure 7 shows the training of the feature extraction model using the synthetic corpus with the addition of mono-

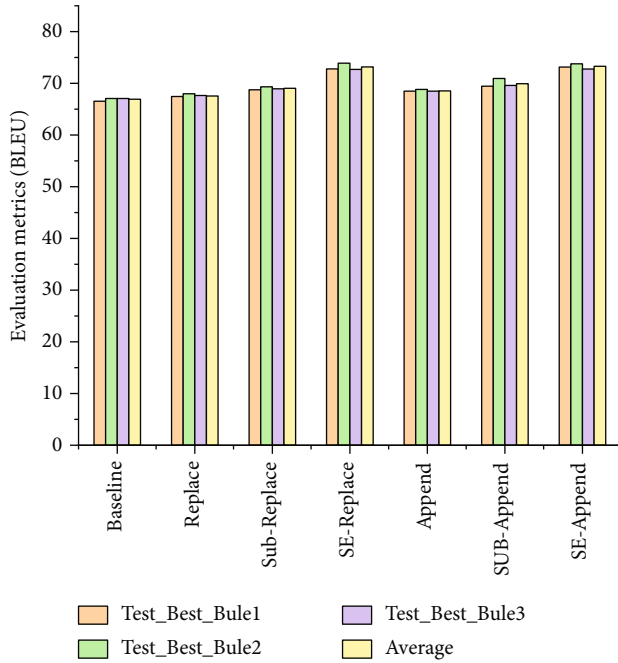


FIGURE 4: Test set translation performance.

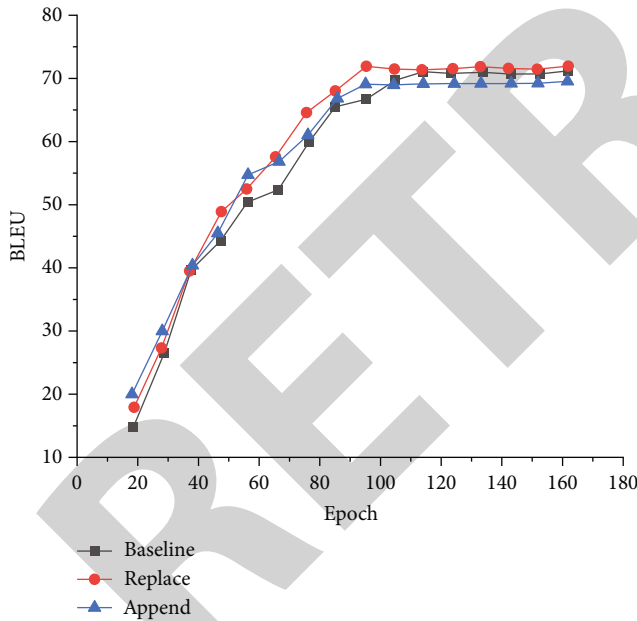


FIGURE 5: Epoch-BLEU change chart 1.

zh and syn-vi, and Figure 8 shows the training of the feature extraction model with the synthetic corpus with the addition of syn-zh and mono-vi. The experimental results show that the addition of synthetic corpora produces favorable results for the training of the translation quality estimation model, and the Pearson correlation coefficients in the Chinese-English direction are better than those in the English-Chinese direction.

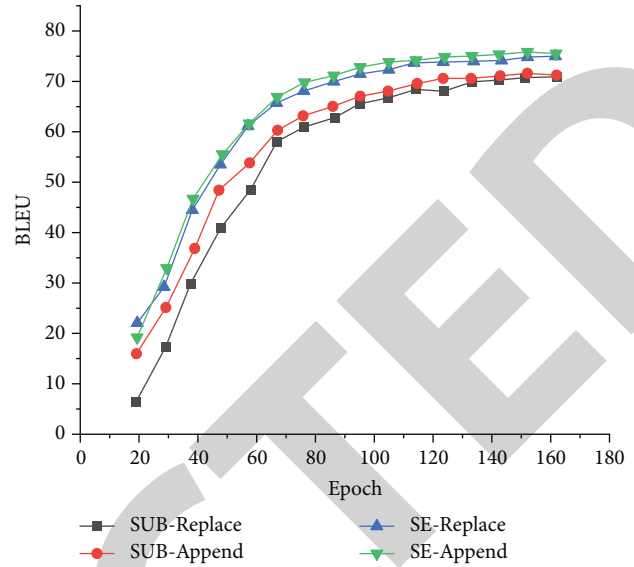


FIGURE 6: Epoch-BLEU change chart 2.

5. Conclusions

For domain-oriented machine translation tasks, this paper takes Bai Yuchan's thought as an example to carry out domain machine translation research and proposes a new energy domain term information as a priori knowledge into neural machine translation through term replacement. The identifiers "<S>" and "<E>" are used to identify the target-side terms, and the target-side terms are separated from the sentence components of the source language and target language. The identifiers "<S>" and "<E>" are input as additional knowledge to guide the translation process. Experiments show that using target-side terms to replace source-side terms and splicing target-side terms to source-side terms can effectively incorporate domain terms as prior knowledge into neural machine translation, improving term translation effects. As special external knowledge, identifiers will give the neural network additional learning guidance. When the neural machine translation model learns the correspondence between the source language and the target language, it will focus on the target-side terms identified by special symbols, thereby improving translation quality of tagged terms and improving overall translation quality while ensuring that domain terms are correctly translated.

Bai Yuchan's Taoist health-preserving thought is an important part of Chinese Taoist health-preserving thought. It is a sublimation on the basis of inheriting the Confucian and Taoist health-preserving ideas and can meet the needs of medical development, government health care work, and personal health preservation. Therefore, it is necessary to carry out white jade The Translation and Introduction of Toad Taoism's Health-keeping Thought. The main change of the method in this paper is at the data level. Compared with the model modification, the method in this paper is simple, practical, and easy to implement and has achieved

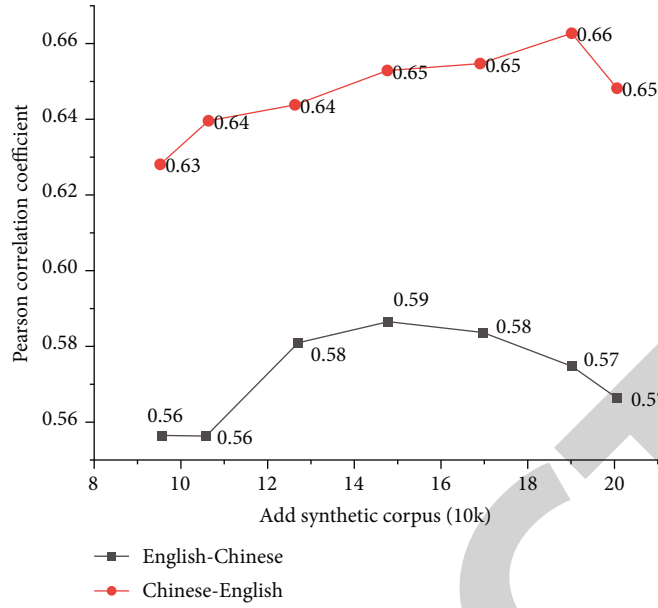


FIGURE 7: Add synthetic (mono-zh) corpus experimental results.

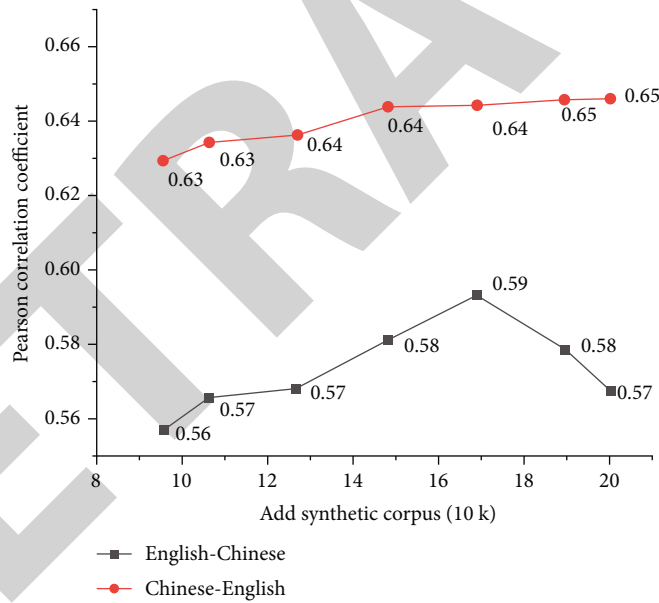


FIGURE 8: Add (syn-zh) synthetic corpus experimental results.

obvious results in the experiment. In addition, the method in this paper has generality in improving the translation quality of domain terminology under the premise of ensuring domain-aligned corpus and domain terminology knowledge base. In the next step, we will explore how to use multiple encoders in domain machine translation to model external prior knowledge such as terminology dictionaries and syntactic information and integrate domain features into neural machine translation models at the model level, incorporating semantic roles as prior knowledge into neural machine translation, using additional semantic role information in the source-side horizontal encoder and vertical encoder to improve traditional neural machine translation models,

and solving problems such as semantic missing translation and discontinuous translation.

In the next step, we will explore how to use multiple encoders in domain machine translation to model external prior knowledge such as terminology dictionaries and syntactic information and integrate domain features into neural machine translation models at the model level.

Data Availability

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

Conflicts of Interest

The authors declare that there are no conflicts of interest.

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References

- [1] C. Ducar and D. H. Schocket, "Machine translation and the L2 classroom: pedagogical solutions for making peace with Google translate," *Foreign Language Annals*, vol. 51, no. 4, pp. 779–795, 2018.
- [2] K. N. Dew, A. M. Turner, Y. K. Choi, A. Bosold, and K. Kirchoff, "Development of machine translation technology for assisting health communication: a systematic review," *Journal of Biomedical Informatics*, vol. 85, pp. 56–67, 2018.
- [3] B. Savoldi, M. Gaido, L. Bentivogli, M. Negri, and M. Turchi, "Gender bias in machine translation," *Transactions of the Association for Computational Linguistics*, vol. 9, pp. 845–874, 2021.
- [4] S. M. Lee, "The impact of using machine translation on EFL students' writing," *Computer Assisted Language Learning*, vol. 33, no. 3, pp. 157–175, 2020.
- [5] X. Wang, C. Chen, and Z. Xing, "Domain-specific machine translation with recurrent neural network for software localization," *Empirical Software Engineering*, vol. 24, no. 6, pp. 3514–3545, 2019.
- [6] M. Yamada, "The impact of Google neural machine translation on post-editing by student translators," *The Journal of Specialised Translation*, vol. 31, pp. 87–106, 2019.
- [7] D. Moussallem, M. Wauer, and A. C. N. Ngomo, "Machine translation using semantic web technologies: a survey," *Journal of Web Semantics*, vol. 51, pp. 1–19, 2018.
- [8] M. Araújo, A. Pereira, and F. Benevenuto, "A comparative study of machine translation for multilingual sentence-level sentiment analysis," *Information Sciences*, vol. 512, pp. 1078–1102, 2020.
- [9] L. Lin, J. Liu, X. Zhang, and X. Liang, "Automatic translation of spoken English based on improved machine learning algorithm," *Journal of Intelligent & Fuzzy Systems*, vol. 40, no. 2, pp. 2385–2395, 2021.
- [10] S. C. Robinson, "Trust, transparency, and openness: how inclusion of cultural values shapes Nordic national public policy strategies for artificial intelligence (AI)," *Technology in Society*, vol. 63, article 101421, 2020.
- [11] A. Oday, A. Oztüren, M. Ilkan, and A. M. Abubakar, "Do eReferral, eWOM, familiarity and cultural distance predict enrollment intention? An application of an artificial intelligence technique," *Journal of Hospitality and Tourism Technology*, vol. 12, no. 3, pp. 471–488, 2021.
- [12] S. Kanwal, S. Asghar, A. Hussain, and A. Rafique, "Identifying the evidence of speech emotional dialects using artificial intelligence: a cross-cultural study," *PLoS One*, vol. 17, no. 3, article e0265199, 2022.
- [13] A. Di Vaio, R. Palladino, R. Hassan, and O. Escobar, "Artificial intelligence and business models in the sustainable development goals perspective: a systematic literature review," *Journal of Business Research*, vol. 121, pp. 283–314, 2020.
- [14] A. M. Espín-León, A. Jimeno-Morenilla, M. L. Pertegal-Felices, and J. Azorín-López, "Cultural identity distance computation through artificial intelligence as an analysis tool of the amazon indigenous people. A case study in the Waorani community," *Sustainability*, vol. 12, no. 22, p. 9513, 2020.
- [15] M. Li and H. Lv, "A study on the construction of O2O teaching system of college English cross-cultural knowledge based on MOOC artificial intelligence," *Journal of Intelligent & Fuzzy Systems*, vol. Preprint, pp. 1–6, 2021.
- [16] F. S. Chance, J. B. Aimone, S. S. Musuvathy, M. R. Smith, C. M. Vineyard, and F. Wang, "Crossing the cleft: communication challenges between neuroscience and artificial intelligence," *Frontiers in Computational Neuroscience*, vol. 14, p. 39, 2020.
- [17] J. Xie, "Innovative Design of Artificial Intelligence in Intangible Cultural Heritage," *Scientific Programming*, vol. 2022, Article ID 6913046, 8 pages, 2022.
- [18] M. O. R. Prates, P. H. Avelar, and L. C. Lamb, "Assessing gender bias in machine translation: a case study with google translate," *Neural Computing and Applications*, vol. 32, no. 10, pp. 6363–6381, 2020.
- [19] Á. Peris, M. Domingo, and F. Casacuberta, "Interactive neural machine translation," *Computer Speech & Language*, vol. 45, pp. 201–220, 2017.
- [20] M. Popel, M. Tomkova, J. Tomek et al., "Transforming machine translation: a deep learning system reaches news translation quality comparable to human professionals," *Nature Communications*, vol. 11, no. 1, pp. 1–15, 2020.
- [21] F. M. Zanzotto, "Viewpoint: human-in-the-loop artificial intelligence," *Journal of Artificial Intelligence Research*, vol. 64, pp. 243–252, 2019.
- [22] Y. Graham, T. Baldwin, A. Moffat, and J. Zobel, "Can machine translation systems be evaluated by the crowd alone," *Natural Language Engineering*, vol. 23, no. 1, pp. 3–30, 2017.
- [23] M. Johnson, M. Schuster, Q. V. Le et al., "Google's multilingual neural machine translation system: enabling zero-shot translation," *Transactions of the Association for Computational Linguistics*, vol. 5, pp. 339–351, 2017.
- [24] H. Choi, K. Cho, and Y. Bengio, "Fine-grained attention mechanism for neural machine translation," *Neurocomputing*, vol. 284, pp. 171–176, 2018.
- [25] D. A. Hashimoto, G. Rosman, D. Rus, and O. R. Meireles, "Artificial intelligence in surgery: promises and perils," *Annals of Surgery*, vol. 268, no. 1, pp. 70–76, 2018.
- [26] T. G. Dietterich, "Steps toward robust artificial intelligence," *AI Magazine*, vol. 38, no. 3, pp. 3–24, 2017.