The Application of Multimedia Network Technology in Network Technology

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Abstract. This paper reviews the core technology system of machine translation under the condition of multimedia technology, and holds that the key links of machine translation are "sentence element" extraction, corpus selection, word selection, word order adjustment, sentence evaluation, etc., which can be realized by machine learning neural network. Corpus maintenance is not only the core work of MT, but also the key to determine the quality of Mt.

Keywords: Multimedia Network, Network Technology, Network Technology, Sentence Element

1. Introduction
The development of machine translation technology has been closely related to the development of computer technology, information theory, linguistics and other disciplines. From the early dictionary matching, to the rule translation of dictionaries combined with linguistic expert knowledge, then to the statistical machine translation with the help of corpus, with the improvement of computer computing ability[1]. Economic globalization makes the communication around the world expand rapidly, the mutual transformation of language, the mutual transformation of words and the exchange of language and words are likely to be used by people anytime and anywhere, which promotes the development of machine translation technology.

Compared with using a thick dictionary, memorizing a lot of vocabulary and historical and cultural knowledge, there is no doubt that machine translation tools have the advantages of convenience, quickness and practicality [2]. The prosperity of the economy and the development of Internet technology have made machine translation widely popularized and applied, and the popularization of machine translation tools has promoted the exchange of global science and technology, politics, culture, economy and trade. But language itself belongs to non-standard data, and the process of computer processing non-standard data itself belongs to the weakness of computer computing system. In the past 70 years, machine learning has focused on how to standardize the non-standard features of language in computer systems [3].
2. Technical features of machine translation
In short, machine translation is to translate one language into another [4]. Here, the examples I use are all from Chinese to English. The above sentence is marked with source language, i.e. source language, and the following sentence is marked with target language, i.e. target language [5]. The task of machine translation is to translate the sentence of source language into the sentence of target language. The perfect application of artificial intelligence in machine translation is the dream of scientists, but facing the following internationally recognized challenges.

The first challenge is translation choice. When translating a sentence, we will face many problems of word selection, because polysemy is common in language. For example, in this example, "look" in a sentence in the source language can be translated into words like "look", "watch", "read" and "see". If the later object "book" is not considered, these translations are all right. In this sentence, only when the machine translation system knows the object "book" of "read", can it make a correct translation choice and translate "read" into "read" and "read a book". Translation selection is the first challenge for machine translation.

The second challenge is the adjustment of word order. Because of the differences in culture and language development, we sometimes say such an element first and then another element. However, in another language, the order of these elements may be completely opposite. For example, in this case, "on Sunday", such an adverbial of time is used to be put after the sentence in English. For example, in the translation of Chinese and Japanese, the Chinese syntax is subject predicate object, while the Japanese syntax is subject object predicate, and the Japanese put the verb at the end of the sentence. For example, "I eat" in Chinese, and "I eat" in Japanese. When the sentence is longer, the adjustment of word order will be more complicated.

The third challenge is sparse data. According to incomplete statistics, there are more than 5000 kinds of human languages. Most of the current machine translation technology is based on big data, and only training on a large number of data can get a better effect. In fact, the distribution of language quantity is very uneven. The pie chart on the right shows a distribution of Chinese related languages. As you can see, more than 90% of them are bilingual sentence pairs in Chinese and English. The resources of Chinese and other languages are very few. It is very difficult to train a good system with very little data.

3. The development of machine translation
More than 80 years have passed since the idea of machine translation was put forward in the 1830s [6]. In these more than 80 years of tortuous course, the machine translation added artificial intelligence technology, developed a variety of methods, comprehensive function, rich in content, can no longer be the same as the same year. Until recent years, the latest method appeared. Let me briefly introduce the principles of these methods.

Rule based translation, translation knowledge comes from human experts. Find human linguists to write rules, and translate one word into another. This component is translated into another component, and where it appears in a sentence is indicated by rules. The advantage of this method is that it uses linguistic expert knowledge directly and its accuracy is very high. What are the disadvantages? Its cost is very high. For example, to develop a translation system of Chinese and English, we need to find linguists who can speak Chinese and English at the same time. To develop a translation system for another language, we need to find linguists who understand another language. Therefore, the development cycle of rule-based system is very long and the cost is very high. In addition, it also faces the problem of rule conflict. With the increase of the number of rules, rules restrict and influence each other. Sometimes a rule written to solve a problem may cause translation of other sentences and bring a series of problems. In order to solve this series of problems, we have to introduce more rules to form a vicious circle.
Figure 1. Machine Translation Data Flow Chart

By the 1990s or so, there was a statistical based approach, which we call statistical machine translation. A mathematical model of machine translation is built in statistical machine translation system. As shown figure 1 is the machine translation data flow chart, which can be trained on the basis of big data. Its cost is very low because the method is language independent. Once the model is established, it can be applied to all languages. Statistical machine translation is a corpus based method, so if the amount of data is relatively small, it will face a problem of data sparsity. At the same time, it also faces another problem. Its translation knowledge comes from the automatic training of big data, so how to add expert knowledge? This is also a big challenge for machine translation.

4. Construction of Corpus and Neural Network

Translation knowledge mainly comes from two kinds of training data: parallel corpus, one sentence in Chinese and one sentence in English, and the Chinese and English are corresponding to each other, also called bilingual corpus, monolingual corpus, for example, we call monolingual corpus only in English. What can we learn from parallel corpus? Translation model can learn a table like a dictionary, which is generally called "phrase table". For example, "on Sunday" can be translated into "on Sunday". Then there is a probability, which measures the possibility of two words or phrases corresponding to each other. In this way, the phrase table establishes a bridge between the two languages. For example, if "read a book" is used here, there is no problem with this expression. The probability of "read a" followed by "book" may be 0.5. What about "read a TV"? The probability is very low. Because this does not conform to the syntax of the target language. Therefore, translation model builds a bridge between two languages. Language model is to measure whether a sentence is fluent and authentic in the target language. The combination of these two models, together with some other features, constitutes a formula such as statistical machine translation.

Compared with rules or statistical machine translation tools, the composition and translation process of neural network translation are more concise. The input part is the encoder and the output part is the decoder, where the complex processing is similar to the human brain nerve, all done by the computer. With the development of deep learning technology, neural network translation began to rise in 2014. In 2015, baidu released the world's first Internet neural network translation system. In just three or four years, neural network translation system has surpassed the statistical method in most languages.
5. Summary
Through the analysis of this paper, through the construction of corpus and neural network, the input text is segmented according to the corpus by using the data processing process, and the neural network selects and reorders words on the basis of the segmented "sentence elements". Finally, the reordered sentences are fed back and rolled up to get the final translation results. This is a relatively mature machine translation method at present. There are also machine translation added to speech recognition module or speech output module, but the core part is still this process. With the improvement of non-standard data processing technology or machine learning technology, machine translation may experience a new round of qualitative change in the future.

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References
[1] Arash Dargahi Nobari,Mahmood Neshati,Sajad Sotudeh Gharebagh. Quality-aware skill translation models for expert finding on StackOverflow[J]. Information Systems,2020,87.
[2] Matheus Araújo,Adriano Pereira,Fabrício Benevenuto. A comparative study of machine translation for multilingual sentence-level sentiment analysis[J]. Information Sciences,2020,512.
[3] Zhang Biao,Xiong Deyi,Su Jinsong. Neural Machine Translation with Deep Attention[J]. IEEE transactions on pattern analysis and machine intelligence,2020,42(1).
[4] Huang Jinsong. Application of computer network and multimedia technology in TV stations [J]. China media technology, 2017 (5): 109-110.
[5] Sun Aiping, Zhang Nan. Research on the application of computer network and multimedia technology in TV stations [J]. Science and technology innovation and application, 2016 (21): 112.
[6] Song Wei. Analysis of computer network technology and its application in practice [J]. Electronic technology and software engineering, 2016 (10): 17.