

Parallel Algorithm of Hierarchical Phrase Machine Translation Based on Distributed Network Memory

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ABSTRACT

Machine translation has developed rapidly. But there are some problems in machine translation, such as good reading, unable to reflect the mood and context, and even some languages machines cannot recognize. In order to improve the quality of translation, this paper uses the SSCI method to improve the quality of translation. It is found that the translation quality of hierarchical phrases is significantly improved after using the parallel algorithm of machine translation, which is about 9% higher than before, and the problem of context free grammar is also solved. The research also found that the use of parallel algorithm can effectively reduce the network memory occupation; the original 10-character content, after using the parallel algorithm, only need to occupy 8 characters, and the optimization reaches 20%. This means that the parallel algorithm of hierarchical phrase machine translation based on distributed network memory can play a very important role in machine translation.

KEYWORDS

Distributed Network Memory, Hierarchical Phrase, Machine Translation, Parallelization Algorithm

1. INTRODUCTION

In current Machine Translation, word order model is very important. There are many problems in translation models based on hierarchical phrases, such as cross syntax translation errors, word loss phenomena, and so on. (Tong & Zhu, 2016) is also very serious. Since the reordering effect of hierarchical phrase translation model mainly depends on the selection of hierarchical rules, and hierarchical rules are also the most essential feature of hierarchical phrase translation model different from other models, in this paper, we propose a joint selection method of hierarchical rules, which comprehensively utilizes various features generated in the process of translation, and solves the problem of correct selection of hierarchical rules to a certain extent, And it effectively solves part of the reordering problem based on hierarchical phrase translation model (Yang et al., 2017). Nowadays, the difficulty of statistical machine translation lies in the low syntactic and semantic components contained in the model (Bhadoria & Chaudhari, 2019). Therefore, when dealing with language pairs with large syntactic differences, such as Chinese to English translation, there will be a long distance reordering problem. Sometimes the result of translation can't be understood even though word to

DOI: 10.4018/IJISCM.2022010106

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word is correct. It can be said that the current mainstream statistical machine translation system is still at the bottom of the machine translation Pyramid (Li et al., 2017).

Machine translation refers to the automatic translation of text or speech from one language to another by computer, which belongs to the interdisciplinary research field of computer science and linguistics. In today's social life characterized by knowledge economy, the increasingly frequent international exchanges and the accelerating process of globalization make the total amount of cross language information exchange increase rapidly, and the natural language barrier between different countries and regions becomes more and more prominent. With the help of computer technology, people are eager to break down language barriers and realize smooth interpersonal and inter lingual communication. Therefore, machine translation research has great application value. Gradually improved machine translation technology has more and more extensive application in human social and economic life, and plays an extremely important role in the deeper and faster international information dissemination. Experts at home and abroad have also made a lot of research on hierarchical phrase machine translation (Liu et al., 2017).

Xiao Tong takes hierarchical phrase as the basic model and applies it to tree to string model reinforcement, which increases the space for translation derivation. In this framework, he studies the principles of machine translation and translation decoding technology (Buckley et al., 2019). In his experiment, the efficiency and performance of Chinese-English translation of machine translation have been greatly improved (Gulen et al., 2016) Jiangming introduces the shortcomings of machine translation at present. Aiming at these shortcomings, it uses Japanese case grammar and combines it with machine translation to mark different case information, which makes the language to be translated more obvious and easy to be analyzed. In addition, this method uses Japanese model, so it can achieve better results in Japanese translation, It proposes to use this framework in Japanese phrase translation Yegang hopes to integrate valuable syntax into machine translation, so that after translation, it can be more in line with the grammar and context of the country, and will not cause misunderstanding. Therefore, he puts forward three strategies to integrate bilingual into the machine translation, which integrates the phrases at the grammatical level in the way of hard constraints. The research finds that after the integration, the translated phrases and sentences are more perfect, and in complex long sentences, they are also more perfect It can play a certain role (Chen, 2019). These studies have certain reference value for this paper, but due to the lack of relevant research samples, there is no universal value, the research methods are not rigorous, and there are too few translation reference languages, so it can only improve certain theoretical reference.

In this paper, the hierarchical phrase machine translation model is described comprehensively, and the relevant theory of context free grammar is introduced. The training process of hierarchical phrase model, including rule extraction and rule scoring (Rui, 2017), is realized. The influence of the restriction of hierarchical phrase rule extraction on translation performance is verified by experiments. The decoder of hierarchical phrase model is also implemented, This paper introduces the data structure and efficient algorithm used in the decoder. Through the classification and analysis of hierarchical phrase types, the advantages of hierarchical phrase rules are obtained.

2. PARALLEL ALGORITHM OF TWO LEVEL PHRASE MACHINE TRANSLATION

2.1 Hierarchical Phrase Machine Translation

The process of translation is essentially a process of searching for the optimal solution. The translation system gives the translation with the highest translation probability from the huge candidate translation space. Modern statistical machine translation (SMT) was first proposed by IBM researchers. So far, it has developed from the original word based translation method to the phrase based translation method, and then to the syntax based translation method. Word based translation takes words as the unit of translation and ignores the word order relationship between words, resulting in poor effect of

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