Computer Technology Applied to Machine Translation and Speech Recognition

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Abstract. With the historical development of the new ear, computer technology has brought revolutionary changes to people’s lives. The computer technology is deeply applying to the different kinds of the field. People hope that they can use computers to communicate effectively in the process of communicating by using artificial intelligence technology in daily life, such as machine translation and speech recognition. In this paper, the author introduces how computer technology applies to machine translation and speech recognition.

Keywords: Computer Technology, Machine Translation, Speech Recognition

1. Introduction
The content of computer technology can divide into four parts: computer system technology, computer device technology, computer component technology and computer assembly technology (from the Internet website http://www.baidibaike.com). Now it is facing a series of major new changes. The computer transfers from information processing and data processing to knowledge processing. In addition, the knowledge base is going to replace the database. But natural language, images, handwritings carry out man-opportunity, which will be the important shape of the input and output. Therefore, human-organ system will obtain higher levels. Machine translation and speech recognition will widely promote.

2. The development and application of machine translation in computer technology

2.1. The development of machine translation
Machine translation which also named as automatic translation. It is also using computers to change one natural language into another natural target language (Yang muyun, 2000:30). As a part of natural language processing, machine translation relates to computer linguistics and language understanding. The principle of machine translation is as follows:
In China, this study is also starting early. But between 1956 to 1969, there were no dominating developments influenced by The Times. In the mid-1970s, our county’s machine translation began to research recovery. In the mid-1980s and early 1990s, two pragmatic systems emerged that were crucial to China’s economic history. They are the KY-1 English-China translation system and 863-IMT English-China translation system. In the information age of “knowledge explosion”, machine translation may be the most effective tool to obtain comprehensive and accurate information in “G” as the unit of information ocean(Sun huaimin, 1999). Zhou haizhong(1997) pointed that “To improving the quality of machine translation, firstly the problem to solve is language itself, not the programming problem.” Without understanding how does the people’s brain works on linguistic fuzziness recognition and logic judgment, it is impossible to reach the level of faithfulness, expressiveness and elegant for machine translation. This point of view reveals the bottleneck that restricts the quality of translation. There is an example for the Google translator.

Computers can decode each element accurately and quickly, but the phonetic ambiguity and the fuzziness of sentence meaning will make it difficult for computers to translate complex sentences. But the human brain does the opposite. Instead, it was the length of the sentences and the number of morphemes that affected the translator’s memory and expression.

Machine translation is one of the technological challenges of the 21st century. The problem lies in the ambiguity of natural language at all levels. Because of language differences, there exist huge obstacles to international communication. People, from all different kinds of works, will also be faced with a number of unfamiliar voices composed of documents. If only depend on human translation, this will become a heavy burden, which will reduce work efficiency and affect economic development. But using machine translation, it can be better to solute this problem. Although it is impossible to translate
materials accurately, machine translation can effectively improve people’s understanding of foreign works and effectively promote politics, economic and culture exchanges around the world. Meanwhile, machine translation plays an important strategic role in exploring artificial intelligence and understanding human language and thinking.

2.2. Application of machine translation in computer technology
Due to the rigor of machine translation, people have been actively exploring better ways to solve problems. Up to now, the machine translation methods that have studied mainly include three levels, including Rule-based machine translation, the corpus machine translation and hybrid machine translation. One of the most advantageous is machine translation lied in intermediate languages. There exists a reason that its translation can convert to another language without any languages. For multilingual translation, its existing ways can solve a lot of conversion knowledge to save time and efficiency.

In the machine translation system, it will directly affect the research of machine translation technology. The evaluation system is mainly divided into three aspects: adequacy, fluency and information satisfaction. However, common evaluation standards: subjective evaluation standards, which is by artificial systems of the translation score. The other is the objective automatic evaluation standard, which is to automatically score the translation output of system by establishing a certain data model. For instance, there is a form about machine translation quality assessment.

| Monitoring indicator | Fluency of presentation | Linguistic accuracy | Logical coherence | Information fidelity |
|----------------------|-------------------------|--------------------|------------------|---------------------|
| Repetition and repetition | Accurate and idiomatic word meaning | The information is logical | No information, no solution |
| Filler words and slips of the tongue | Grammatically correct | Use reasonable connections | No information missing or adding |

Manual assessment accuracy is very high, but the evaluation personnel should fully consider the choice of translation and the meaning of the original text, which needs to spend lots of energy and time. So it is very inefficient that not suitable for promotion. On the contrary, objective automatics evaluation has low cost and fast speed. Although the accuracy is not high, it has high reusability. Although machine translation has entered people's lives, it provides a lot of convenience for people’s work and study. However, it said that the current machine translation technology is not mature and further to improving.

3. The development and application of speech recognition in computer technology

3.1. The development of speech recognition in computer technology
Speech recognition technology aims to transform human speech into computer-readable language, which has grown rapidly over the past 20 years. The complete speech recognition system can preprocess the speech signal and extract the features. However, when the speech recognition technology is putting into using, the performance and the effect of product in practical use are far from that in the laboratory, as shown in Figure 3.
3.2. Application of speech recognition in computer technology

The construction of the speech recognition system mainly includes material and preprocessing parts of speech signals, speech recognition post-processing part, feature parameter extraction part, speech recognition core part. When speech recognition applies in life, different speech signals generate as people pronounce the same sound because they speak differently. In the noise environment, speech signals may produce different distortion. The language signal will distort after passing through different kind of channels. In a continuous speech process, the same sound changes differently in different contexts. As a result, speech recognition will have difference degrees of errors in interpretation. Therefore, speech recognition technology is gradually improving, and more complete speech recognition systems will emerge in the future to make translation become easy.

When using voice technology to interpret, it is necessary to establish a multi-type of interpretation corpus. Because of the differences between interpretation and translation in operation mode and information transfer procedures, therefore, the establishment of multi-purpose corpus plays a indelible role in the study and practice of translation.

4. Conclusion

Although computer technology is widely applied to machine translation and speech recognition, which brings convenience to people. it also exists a lot of shortcomings. In the process of translating, the machine translation will exist some problems in knowledge, grammar, vocabulary, semantic and so on. When speech recognition translates automatically, the response accuracy will be affected if the sentence changes. Furthermore, computer technology needs further improvement in the future.

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