Man-Machine Translation——Future of Computer-Assisted Translation

Author: *Zhu Aihua

Foreign Language Department, Guangzhou College of Technology and Business, Guangzhou, Guangdong,510800, China
E-mail: committee_abby@keoaec.org.cn

Abstract: The development of artificial intelligence has given birth to machine translation, which greatly improves translation efficiency. However, the quality of machine translation is not satisfactory, especially in terms of proprietary terms, cultural vocabulary, and text logic. Human-machine translation has become an innovative product of computer-assisted translation, which automatically saves corpus modified or stored by the translator and grows together with it, constituting a unique translation library. After that the machine can automatically identify and retrieve the correct translation in subsequent translation practices, maintaining quality while ensuring quantity and improving translation efficiency.

1. The Dilemma of Machine Translation
With the advent of the Internet age, the speed of obtaining information and its quantity and quality directly affect people's study, work and even income. The Internet knows no borders, and relying solely on the manual translation of human experts for cross-language information conversion can no longer meet the needs of social development. Because a translator’s speed limit is 180 words, while the human reading speed is 1500 words per minute, the gap between the two is 7-15 times. The speed of human translation cannot keep up with the fission speed of information. In recent years, machine translation has been hot, however, there are some obstacles that are difficult to overcome.

1.1. Semantic Problems of machine translation
Vocabulary meanings such as "Three Gongs", "Eight Honors and Eight Disgraces", etc., have low transparency in meaning and cannot be accurately interpreted by machines. Machine translate “sangong” as “three gongs”, while its appropriate translations should be three public consumptions, namely, overseas trips, official receptions, private use of government vehicles. When translating Eight Honours and Eight Disgraces", the exact connotation should be listed, otherwise people from different culture will be confused.

Furthermore, the translation of specific constructions, idioms, slang and allegorical expressions in Chinese is also a difficult problem for machine translation. Machine translation cannot effectively solve the quality problem of cross-lingual information conversion.

1.2. Syntactic problems in machine translation
First of all, the difference in sentence structure between Chinese and English can easily lead to errors in the machine's judgment of sentence components. The subject is often omitted in Chinese, while subject is an essential ingredient in English. In the process of machine translation, the default of the subject of Chinese sentence will easily lead to an English sentence without a subject.
Secondly, the translation of special sentence patterns is difficult for machine. The active voice is often seen in Chinese while passive voice is more often in English, especially in formal styles. In English-Chinese translation, machine translation will only stick to the voice of the original text based on the grammatical structure. As a result, there will be a lot of passive sentences in the translation, which reduces the readability of the translation and even affects the expression of sentences[1].

1.3 Textual problems in machine translation
Chinese is a parataxis language with mostly structurally incomplete sentences, while English is a hypotaxis language and connection words play an important role. In the process of Chinese-to-English translation, machine translation often lacks logical connectives, making sentences loose and incompact, or logically confused. In the process of translating into Chinese, errors such as poor use of words and redundant words are prone to occur[2].

Machine translation works generally require post-editing of translators. However, the resources of translators are limited, so people face a real dilemma: high quality and fees of manual translation but low output and limited supply; or high output and cheap fees but low quality of machine translation. How to get out of this dilemma? After editing the translated materials, it is impossible to prevent the machine from making the same mistakes next time. How to make machines remember the mistakes made like a human being, or have a storage memory function to improve translation efficiency? There is an urgent need for the emergence of "new species" closer to the quality of humans but at the same time closer to the speed of machines.

2. The New Trend of Computer-Aided Translation Technology--Human-Machine Translation

2.1. Working principle of man-machine translation technology
Different languages generally have obvious differences, especially in grammatical rules and expressing habits. Different language symbol systems show asymmetry in information expression in terms of linguistic information such as vocabulary, sentence, grammar, semantics and context, which challenges machine translation. With the wisdom of translators, human-machine translation solves the above problems manually, and stores the correct translation in the machine for next use. This is a process of error correction and memory storage. And the translation machine grows together through the cooperation of translators, it can continuously recognize the respective operating rules of different language systems, and deeply learn and identify various Contextual information in different languages units including long passages, paragraphs, and sentence groups, decoding and encoding the above-mentioned related information quickly and accurately, therefore achieving fast and accurate switching of the code system. Its working principle is shown in the picture below.
The difference between collaborative translation platform and closed translation is that it allows volunteer translators to jointly create and maintain the diversity of languages and cultures, share translation memory software, and share multiple parallel corpora [3]. Translators can upload and maintain translation corpus and terminology database at any time, create, edit, modify and save translation tasks and texts online. It can synchronize terminology and corpus in the background of the software, automatically collecting data, and realizing the replication of translating ability of translators. Through data transmission and processing of the human-computer interaction layer and the application layer, it is realized that humans endow machines with intelligence and machines give human capabilities [4]. Data of terminology, cultural background, translation characteristics, and unique sentence contributed by translators are processed by the smart cloud and stored in the system of the translation machine. In this way, the translation quality can be changed from quantitative to qualitative, meanwhile translators can interact with other translation websites, Comparing them with their own work, and constantly modifying them to achieve the best results.

2.2. A Case analysis of Human-Machine--Twinslator

At present, Twinslator developed by Trans, a software developer in China, has become an innovative model in machine translation industry. Its essence is to train and generate a machine translation system suitable for translators through deep learning and intelligent robot technologies. Users are both beneficiaries and contributors. The number of new terminologies, corpus, corpus usage and translation words increased by tens of thousands per day. Here are some figures of Twinslator in a week in February 2021.
The pictures above show the statistics of Twinslator's new corpus pairs, term pairs, the number of usages, and the number of words translated within a week of February. This technology has become the first choice of many people with translation needs. And application areas cover the fields of architecture, culture, finance, e-commerce, law, literature, machinery and information technology.

3. Outlook

The advantage of human-computer co-translation technology lies in the use of the openness of the Internet to realize the workflow of online collaboration and free translation. Later, artificial intelligence technology is introduced to allow robots to translate together with translators as teams in the form of partners. With the deep integration of translation, human-machine translation model has gradually become mature and perfect.

In the translation process, with the embedding of artificial intelligence, the most suitable translation engine is recommended according to the user's needs and characteristics, thereby improving the translation efficiency; intelligent error correction will reduce the error rate by 90%. Human-machine translation is the product of a variety of artificial intelligence technology applications, integrating natural language processing, deep learning, human-computer interaction and intelligent robotics technology to make it serve translation [5]. With the development of intelligent digitalization, more artificial intelligence technologies will be applied to the language service industry and the continuous development of enterprises, making cross-language translation easier.

References

[1] Liu Zihua. Machine Translation Limitations and Post-Editing Solutions—A Case Study on The Translation of Intellectual Property [D]. Beijing Foreign Studies University, 2020.
[2] Lu Xiaoping. A Discourse translation perspective on AI translation. [D], Beijing Foreign Studies University, 2018
[3] Shao Lu, Cao yixin. Text, Non-text, and Language Resources: The Processes and Products of Crowdsourced Translation. Journal of Foreign Languages. 2020.05
[4] Cui Qiliang. Application of Artificial Intelligence in Language Service Enterprises. Foreign Language and Literature. [J]. 2021.1
[5] Xiao Fenghua. The Application of Human-Machine Translation Interactive Platform in Engineering Translation. Chinese Science & Technology Translators Journal. [J]. 2019.08