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A Comparative Study of Artificial Intelligence and Translation Software in Chinese-English Translation: A Focus on Literary and Technical Texts

LIU Yong-shan

Collage of Foreign Languages, University of Shanghai for Science and Technology, Shanghai, China

In recent years, the domain of machine translation has experienced remarkable growth, particularly with the emergence of neural machine translation, which has significantly enhanced both the accuracy and fluency of translation. At the same time, AI also showed its tremendous advancement, with its capabilities now extending to assisting users in a multitude of tasks, including translation, garnering attention across various sectors. In this paper, the author selects representative sentences from both literary and scientific texts, and translates them using two translation software and two AI tools for comparison. The results show that all four translation tools are very efficient and can help with simple translation tasks. However, the accuracy of terminology needs to be improved, and it is difficult to make adjustments based on the characteristics of the target language. It is worth mentioning that one of the advantages of AI is its interactivity, which allows it to modify the translation according to the translator's needs.

Keywords: Artificial Intelligence, translation software, literary texts, technical texts

Introduction

The translation industry has a long history and is constantly evolving. With the development of globalization and cross-cultural exchange, the demand for translation services has also grown. Currently, the translation industry is undergoing a transformation towards digitalization. Traditional translation rely on human translators who usually have a profound grasp of languages and background knowledge, enabling them to provide high-quality translations. However, with technological advancements, machine translation is emerging, bringing new changes to the translation industry.

The advantage of machine translation lies in its high efficiency and low cost, making it a great tool for handling large-scale translation tasks. However, compared to human translation, machine translation still has limitations in terms of accuracy and context understanding. Human translators can usually generate better translated text because they do in-depth research in advance and they know what phrase to choose in certain context. Human translation has irreplaceable advantages when dealing with complex and creative texts.

LIU Yong-shan, Master degree, Collage of Foreign Languages, University of Shanghai for Science and Technology.

It can be said that machine translation and traditional translation each have their strengths. Machine translation has advantages in speed and cost, which can be used when processing a large amount of text in a short period of time; while human translation is superior in terms of quality and depth, suitable for occasions where translation quality is extremely important. With the advent of artificial intelligence, it can assist people in tasks such as writing emails, risk monitoring, and text translation. So, when it comes to translation does artificial intelligence have any advantages compared to other mainstream translation software? This is a topic we will discuss in this article.

Research Method

This article selects representative Chinese sentences from two types of texts, literary and scientific, and translates them using two mainstream translation software, Baidu Translate and DeepL, as well as two artificial intelligence tools, ChatGPT and Kimi. At the end of the paper, we will compare the strengths and weaknesses between different translation software and AI translation.

Research Content

Literary Text

The style of literary texts varies with the emotions and attitudes expressed in the work, offering a rich array of modes of expression. Translators need to find corresponding and appropriate expression in the target language. In addition, literary texts often employ rhetoric such as metaphor and personification to enhance readability, so in some cases, translators must make trade-offs between fidelity and fluency, and seek a balance between domestication and foreignization (孙致礼, 2002, pp. 39-43). Besides, literary texts often contain cultural and historical information, which translators should pay attention to as a way to improve the cultural acceptability.

Example (1):

> 深潭为白日所映照，河底小小白石子，有花纹的玛瑙石子，全看得明明白白。
>
> 百度翻译: The deep pool is reflected by the white sun, and the small white stones and patterned agate stones at the bottom of the river are all visible.
>
> DeepL: Deep pool for the white sun reflected, the bottom of the river small white stones, there are patterns of agate stones, all see clearly.
>
> ChatGPT: The deep pool reflects the daylight, revealing small white pebbles on the riverbed, including agate stones with patterns, all clearly visible.
>
> Kimi: The deep pool is illuminated by the daylight, and the small white pebbles at the bottom of the river, along with the patterned agate pebbles, can all be seen clearly and distinctly.

DeepL adopts a word-for-word translation, where the word order of translated text remain unchanged. It is difficult to understand the meaning from the translation alone. Although the other three translations also fall far short of the standards for publication, they can basically convey the meaning of the original text. In comparison, Baidu's translation uses simpler structure and vocabulary. The AI translation, on the other hand, employs parenthetical phrases, giving a sense of space and literary quality.

Example (2):

他脚步豪迈如昔，只是落地微颤，身子随着抖动。

百度翻译: His footsteps were as bold as ever, but he trembled slightly when he landed, and his body trembled with him.

DeepL: He landed on his feet with the same bravado as before, only landing with a slight tremor, his body shaking with it.

ChatGPT: His stride is as bold as ever, but there is a slight tremble when his feet touch the ground, and his body shakes along with it.

Kimi: His stride was as bold as ever, but with a slight tremble upon landing, his body quivered in response.

The original text is generally easy to understand, but it is important to note that "只是" here does not mean "only" but indicates a contrast. DeepL translated "只是" as "only", neglecting the context of the original text, which leads to a mistranslation, while the other three translations have captured the sense of contrast. Among them, Baidu's translation contains the word "tremble" twice. It would be better to replace one with a synonym. Kimi interprets the body's shivering as a reaction to a slight tremor upon landing therefore uses "in response" at the end of the translation. Technically, that is not wrong, but a bit awkward. Overall, the translation by ChatGPT is the most appropriate.

Example (3):

晚饭花开得很旺盛，它们使劲地往外开，发疯一样，喊叫着，把自己开在傍晚的空气里。

百度翻译: The flowers bloomed vigorously during dinner, and they vigorously bloomed outside, shouting wildly, immersing themselves in the evening air.

DeepL: The dinner flowers were in full bloom, and they drove themselves outward with all their might, going mad, shouting, and opening themselves up to the evening air.

ChatGPT: The evening primroses bloomed vigorously at dinner time, pushing outward with force, almost frenzied, shouting, unfolding themselves into the evening air.

Kimi: The dinner flowers are blooming exuberantly, they are pushing outwards with all their might, as if in a frenzy, shouting, and opening themselves into the evening air.

The evening flowers are in full bloom, they are straining to open outwards, frenziedly, screaming, blossoming in the evening air.

In the original text, "晚饭花" refers to the Four o'clock flower, also known as the marvel of Peru, which is named so because it often blooms around dusk. Baidu's translation renders "晚饭花" as "flowers", while DeepL and Kimi translate it as "dinner flowers", and ChatGPT does not specify the name of the flower, instead expressing that "it will bloom at dinner time". Each of these approaches has its considerations, but since the name "晚饭花" is mentioned in the original text, it would be better to have a corresponding expression in the translation as well. Baidu's translation does not have this, and "bloomed" and "vigorously" are mentioned twice, which is not quite appropriate. DeepL and Kimi's translation can be considered standard. ChatGPT takes the characteristic of the flower as the main clause, with the rest translated in a non-finite form, which makes the translation more natural and fluent.

Scientific Text

The scope of scientific texts is broad. It encompasses academic papers, patent documents, product manuals, and policy documents that involve scientific content, among others. Generally, scientific texts are specialized, containing a large number of terms and concepts, requiring translators to have background knowledge in the relevant field. For unfamiliar terms, verification is necessary to ensure the accuracy of the content. Scientific texts are relatively objective and serious as it based on concrete facts, therefore its objectivity and seriousness must be reflected in the translation. Faced with different texts, translators need to adjust the style of the translation.

Example (4):

> 鼓膜后面是中耳，中耳有三块小骨头，称之为锤骨、砧骨和镫骨，它们如同杠杆将震动鼓膜的声音放大。
>
> 百度翻译: Behind the eardrum is the middle ear, which has three small bones called the malleus, incus, and stapes. They act like levers to amplify the sound of vibrating the eardrum.
>
> DeepL: Behind the eardrum is the middle ear, which has three small bones called the hammer, anvil, and stapes, which act as levers to amplify the sound that vibrates the eardrum.
>
> ChatGPT: Behind the eardrum is the middle ear, which contains three tiny bones called the hammer, anvil, and stirrup. They act like levers to amplify the sound vibrations of the eardrum.
>
> Kimi: Behind the eardrum lies the middle ear, which contains three small bones known as the malleus, incus, and stapes. They act like levers to amplify the sound vibrations of the eardrum.

Scientific texts often contain a large number of technical terms, and identifying these terms and maintaining their accuracy is a key and challenging aspect of scientific translation. “锤骨、砧骨和镫骨” are the three auditory ossicles in the middle ear. Baidu and Kimi translated them as “the malleus, incus, and stapes”, while DeepL and ChatGPT translated them as “the hammer, anvil, and stirrup”. However, these are just two different English expressions, both of which are correct. The author asked ChatGPT if “the malleus, incus, and stapes” could replace “the hammer, anvil, and stirrup” in its translation, and ChatGPT gave an affirmative answer and provided the revised translation, further confirming the accuracy of both expressions. Additionally, among the four translations, the terms “中耳” and “鼓膜” were translated identically and were verified to be accurate.

Example (5):

> 只要把这个设计稍作修改，就可以大大提高该武器的杀伤力。
>
> 百度翻译: As long as this design is slightly modified, the lethality of the weapon can be greatly improved.
>
> DeepL: The lethality of the weapon could be greatly increased with minor modifications to this design.

ChatGPT: Just by making slight modifications to this design, the lethality of this weapon can be significantly increased.

Kimi: With just a few modifications to this design, the lethality of the weapon can be greatly enhanced.

Observations reveal that the original text contains "只要……就……" ("as long as… then…"), which makes it a conditional sentence. While using the same structure in the translation is more faithful to the original, it may seem redundant to readers. The best approach is to nominalize the content, translating the original text into a "noun + verb + noun" pattern, which can make the translation simpler (李丙午 & 燕静敏, 2002, pp. 5-7). Among the four translations, DeepL, ChatGPT, and Kimi all abandoned the "只要……就……" structure, processing part of it into a nominalized form, enhancing the fluency of the sentence; whereas Baidu's translation adheres to the original text, using passive voice in two consecutive clauses, which can be cumbersome to read.

Example (6):

视频采集设备有两种：模拟采集设备和数字采集设备。

百度翻译: There are two types of video capture devices: analog capture devices and digital capture devices.

DeepL: There are two types of video capture devices: analog capture devices and digital capture devices.

ChatGPT: Video capture devices come in two types: analog capture devices and digital capture devices.

Kimi: There are two types of video capture devices: analog capture devices and digital capture devices.

In English, it is advisable to avoid repetition, and the original text mentions "采集设备" three times and all four translations correspondingly rendered it as "capture devices" three times, which does not conform to the conventions of English writing (刘庆元, 2004, pp. 95-99). In fact, retaining only the first "devices" and omitting the subsequent two can resolve the issue of repetition without affecting the expression. However, none of the four translation tools adopted this approach. The author asked ChatGPT and Kimi to avoid repetition and provide a new translation. They translated the corresponding part of the original text as "analog and digital capture devices", making the translation more concise and fluent.

Conclusion

In general, although all four translation tools are very efficient and have the ability to recognize and translate terminology in specific fields. The translations provided by artificial intelligence are relatively better than translation software and can be used as an aid in basic translation tasks. However, to ensure the accuracy of the terminology, translators must verify the terms before finalizing the draft (罗季美 & 李梅, 2012, pp. 84-89). They tend to be constrained by the original text and find it difficult to make adjustments. Besides, when faced with texts that are highly literary or ambiguous, their performance falls short of requirements. They not only fail to recreate the style of the original work but also are prone to errors. Their translation must be polished by a translator before they can serve as official translations (王楚童, 2024, pp. 79-91). It is worth mentioning

that one of the major advantages of artificial intelligence is its interactivity (王和私 & 马柯昕, 2023, pp. 23-26). If an expression that does not fit the characteristics of the text is found, one can ask the AI to modify it; if there are terms that are difficult to determine, one can directly ask the AI, using its response as a reference to guide one's own translation work.

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