



Mistranslation in the English AI Translation of Classical Poetry: A Comparative Study of AI Translation and Yuanchong Xu's Version of "*A Moonlit Night On The Spring River*"

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Abstract. AI is widely used by virtue of its efficiency and convenience. However, when facing literary and emotional texts, its limitations are increasingly prominent. This paper systematically analyzes the mistranslation of AI translation of classical poetry by comparing Yuanchong Xu's English translation of "*A Moonlit Night On The Spring River*" with Doubao's and Gemini's AI translation. The study found that there are systemic problems in AI translation, such as stiff translation, inappropriate semantic expression, cumbersome translation, and cultural image distortion. The root cause is that the prediction mechanism based on statistical probability of the large language model lacks a deep understanding of cultural context, historical background, and emotional intention, and it is difficult to achieve "emotional expression". The research points out that AI performs well in low-level cognitive tasks, but it has obvious limitations in high-level cognitive fields such as cultural image reappearance and creative expression. It is suggested to build a human-computer cooperation path of "AI translation--AI data search--artificial beautification processing", give full play to the advantages of AI efficiency and human translators' cognitive advantages, and seek a balance between cultural communication and readers' understanding, so as to realize the ideal of cross-cultural communication of classical poetry.

Keywords: "*A Moonlit Night On The Spring River*", AI Translation, Yuanchong Xu, Mistranslation in English Translation

1 Introduction

In recent years, with the rapid development of science and technology, AI translation has been widely used in the field of text translation and cross-cultural communication with the advantages of high efficiency, convenience and low cost, and has become a new convenient tool for people. However, when dealing with classical poetry texts with high conciseness, implicitness and cultural specificity, AI translation still faces many challenges, and it is difficult to achieve the accurate transmission of "faithfulness, expressiveness and elegance" [1].

As one of the core carriers of fine traditional Chinese culture, the quality of English translation of classical poetry is directly related to the international influence of Chinese culture. Ruoxu Zhang's "*A Moonlit Night On The Spring River*" is known as "a lonely work towers over the whole Tang Dynasty", which has become a classic case study of English translation of classical poetry since the 20th century. Although the Chinese translators represented by Yuanchong Xu have put forward the systematic theory of poetry translation, there are still few studies on the systematic comparison between AI translation and traditional artificial English translation [2,3]. Foreign studies are mainly about the comparison between different AI models after translation, while domestic studies are about the teaching application of AI to English translation of classical poetry, especially the lack of in-depth study from the perspective of specific mistranslation.

Based on this, this study takes "*A Moonlit Night On The Spring River*" as the research object, uses the well-known AI software at home and abroad to translate it and compares it with Xu's English translation, aiming to analyze the shortcomings of AI's English translation of ancient poetry from four dimensions: the stiff translation, the inappropriate semantic expression, the cumbersome translation and cultural image distortion, so as to lay a theoretical foundation for subsequent research and provide improvement direction.

According to Weiloong Shan's systematic research on Chinese-English mistranslation, the causes of mistranslation can be summarized into five dimensions: lack of information, the inappropriate semantic expression, the cumbersome translation, the stiff translation, and cultural image distortion [4]. With the continuous progress of technology, AI translation has been less prone to errors, such as lack of information. The essence of probabilistic text generation tends to choose the "most commonly used" collocation rather than the "most delicate" collocation, and lacks macro control over the overall structure and aesthetic intention of poetry, showing typical descriptive translation characteristics. This internal limitation is the fundamental reason for the above four types of mistranslation problems, which is also the reason for the following in-depth discussion of AI. The improvement path of English translation provides a theoretical basis.

2 A Comparative Analysis of Xu's Translation of "*A Moonlit Night On The Spring River*" and AI Translation

Zhang's "*A Moonlit Night On The Spring River*" has a graceful rhythm and beautiful language. It is praised by later generations as "a lonely work towers over the whole Tang Dynasty". It is one of the peak works with both artistic conception and talent in Tang poetry. This paper uses Doubao and Gemini AI software to translate "*A Moonlit Night On The Spring River*", compares the English translation of Xu's version with the English translation of two AI versions, and analyzes the mistranslation phenomenon of AI translation.

2.1 The Stiff Translation

In the practice of Chinese-English translation, the stiff translation means that the translation is too rigid in the original words and sentences, resulting in some obscure translations, such as the use of person and verb, which affects the effect of translation.

For example:

The original poem: 滟滟随波千万里，何处春江无月明！

Doubao's version: Its shimmer glides with waves for ten thousand li;

Where on the spring river is no moonlit light!

Gemini's version: Follow the waves, the moonbeams shimmer far and free,

Where'er the river flows, there is the spring moonlight.

Xu's version: She follows the rolling waves for ten thousand li,

And where the river flows, there overflows her light.

In terms of personal choice, Xu chose to use the third person "She" to directly refer to the moon, used personification rhetoric to strengthen emotion, pointed out the female identity of the moon in traditional Chinese culture, inherited the traditional Chinese motif of Chang'e (the fairy living on the moon), and gave emotional temperature. The use of "Its" in the translation of Doubao is a neutral reference, which refers to objective things and loses the emotional temperature contained in poetry. The moon god (Luna/Diana) in ancient Greek and Roman mythology is a female image. In the romantic poetry of Byron and Shelley, the moon is a symbol of melancholy, change, and motherhood, and the use of "she" can also slightly fit the expression of the poem. Gemini's translation has created a hanging structure; "follow the waves" has no logical subject, and the direct use of "moonbeam" is not poetic.

The "there overflows her light" translated by Xu adopts there flip (there+verb+subject), which is in line with the ancient and elegant usage of English Poetry (such as "there comes a time"), and the burst of "overflows" strengthens the intensity of moonlight pouring. The "where on the spring river is no moonlit light!" translated by Doubao is a interrogative sentence form, but it lacks the "there" guiding word, forming a broken structure of "Where...is no...", and the meaning is completely wrong. The original poem says that there is no place without the moonlight, which is more fun to read. In addition, the semicolon uses machinery, and there is no logical transition or parallel connection between the two sentences. The semicolon separates the causal fluency of "follows the rolling waves" and "where the river flows". The sentence pattern of "where 'er the river flows, there is the spring Moonlight," translated by Gemini, indicates existence, and the statement tone is poetic.

The reason why Xu's translation is better is that he dares to break through the literal constraints, reverse translates "nowhere" with "overflow", and rebuilds the emotional subject with "she", which is a cross-cultural poetic recreation. AI uses the translation method to roughly translate the basic surface meaning of the original poem, but there are also errors. The artistic conception is different from that of the original poem, and the translated poem can not convey feelings and ideas.

2.2 The Inappropriate Semantic Expression

In the study of C-E translation, the inappropriate semantic expression means that the translation fails to accurately convey the core semantic connotation of the original at

the level of lexical choice, conceptual correspondence or pragmatic effect, resulting in the deviation, weakening or dislocation of the source language information in the target language.

The original poem: 春江潮水连海平，海上明月共潮生。

Doubao's version: The spring river's tide blends with the ocean's plain;

The moon above the sea rises with the tide.

Gemini's version: In spring, the river rises as high as the sea,

And with the river's tide uprises the moon bright.

Xu's version: In spring, the river rises as high as the sea,

And with the river's rise the moon uprises bright.

The semantic expression deviation here is the distortion of logical relations. The logic of the original poem is because of the progressive relationship among the spring flood coming, the rise of the river, the balance between the river and the sea, and the symbiosis of the moon with the river's rise. "In spring the river rises" translated by Xu points out the specific phenomenon of spring flood, "as high as the sea" establishes the level comparison relationship and the logical chain is correct. Doubao is translated as "the spring river's tide tides with the ocean's plain", which makes a mistake of conceptual confusion. "Tide" refers to the periodic fluctuation of sea water, while "Spring River tide" refers to the river water rise caused by spring rainfall. The two factors are different and cannot be confused. The logical confusion is also reflected in the fact that "blends with" implies the blending of river water and sea water, emphasizes static results, and loses the sense of vast extension of water and sky, and "ocean's plain" is a combination of creation and poetic obscurity. The original poem is a visual horizontal connection, not a physical mixture. Semantic deviation leads to the picture from "water and sky line" to "chaos". The "river's tide" translated by Gemini also mistakenly equates the spring flood of rivers with ocean tides, ignoring the characteristics of "Spring River" as a freshwater river.

In translation, whether the meaning of words can be correctly selected depends on the translator's correct understanding of the original text. In order to correctly understand the original text, it is necessary to reconsider the original text, which is extremely important for both English-Chinese and Chinese-English translation. The typical cause of errors is the wrong interpretation of logical relations in poetry, which leads to mistranslation.

In the translation of classical poetry, the inappropriate semantic expression is particularly hidden and harmful: it is different from the obvious grammatical errors or information omissions. It is often manifested as "seemingly smooth but actually distorted", which makes the target language readers have a reading experience of "understanding but not feeling", thus losing the aesthetic meaning and cultural depth of the original text.

2.3 The Cumbersome Translation

In the study of C-E translation, the cumbersome translation refers to the addition of unnecessary words, structures or semantic elements in the translation when conveying the information of the source language, which leads to lengthy and tardy expression

and damage to conciseness, but dilutes or interferes with the core meaning of the original text.

The original poem: 白云一片去悠悠，青枫浦上不胜愁。

Doubao's version: A wisp of white cloud drifts away, far and slow;

On Green Maple Shoal, grief weighs the heart full low.

Gemini's version: Away, away goes a cloud white and lone;

On Maple Shore how can the parted but groan?

Xu's version: Away, away is sailing a single cloud white;

On Farewell Beach pine away maples green.

The "farewell" translated by Xu is a cultural value-added and contains the meaning of parting. Although it is not a literal translation, it is equivalent to the image, and puns "pine away". Doubao translated "far and slow" to explain, while the use of "full" to modify "low" is a little stiff and overly explanatory, "weights" with "full low" as a burden, which strongly adds rhyme. Gemini's translation of "white and long" adjectives is clumsy, with "long" strongly rhymed and "groan" groaning, which is even more funny.

Through the pun of "pine away" and the inversion of "Maple green", Xu reconstructed the paradoxical aesthetics of "On Farewell Beach pine away maples green" in English -- the maple tree is haggard because of sadness, but it remains green, and life and sadness coexist.

There are great differences between Chinese and English. Chinese uses a variety of artistic techniques, such as overlapping, antithesis, rhyme, allusion, etc., but it does not appear cumbersome, and the writing is more fluent. When translated into English, simple and literal translation is counterproductive, because English is a concise language, which will make the expression of English cumbersome and cumbersome, and affect or seriously damage the expression effect of the original text [5]. Therefore, in the process of translation, some repetitive words or words with repetitive meanings in the original text and some overlapping modifiers can be included in the context of the English translation according to the meaning expressed.

2.4 Cultural image Distortion

In the study of C-E translation, cultural image distortion refers to the distortion, weakening or misreading of the cultural gene, emotional tension or philosophical meaning of the original image due to the dislocation of culture and symbol or the conflict of aesthetic framework when the image carrying a specific cultural connotation is transformed in the translation [6.7]. There are many image words in the moonlight on the spring river.

For example:

The original poem: 月照花林皆似霰。

Doubao's version: The moon sheds light, on blooms like hoarfrost lay.

Gemini's version: The moon sheds light on flowering groves like frozen dew.

Xu's version: The blooming flowers in her light all look like snow.

Translation of the word "graupe!": Xu translated it into "Snow", replacing graupel with snow. Although it is not a literal translation, it is culturally equivalent. Snow is a symbol of purity, coldness and beauty in both China and the West. It captures the visual

essence with the optical effect of snow (white, flickering, and granular). Doubao is translated into "hoarfrost", graupel is small ice particles falling in the air, and "hoarfrost" is the white frost condensed on the ground. Its physical form is misplaced, and the white frost in the west is often associated with decay, cold winter, and death (such as "frost of age"), and its emotional color is misplaced. Gemini translates as "frozen dew", and dew freezing is a cruel image, meaning devastation, which is contrary to the praise tone of the original poem.

Language is an important carrier of culture and reflects the national culture. If it wants to translate a piece of classical poetry well, it must understand and grasp the culture behind it in detail, so as to truly understand the similarities and differences between Chinese excellent traditional culture and other national cultures [8]. In particular, the differences between Eastern and Western cultures will lead to different understandings of the same thing or the same concept, and even lead to misunderstanding between each other [9]. Therefore, in the process of translation, some cultural issues should be properly handled to conform to the expression habits of English, but at the same time, the profound connotation of the national culture should not be lost, so that the English audience can accept and understand [10].

3 Discussion

The systematic defects of AI translation in the English translation of "*A Moonlit Night On The Spring River*" have been exposed: whether it is the lack of emotional temperature of personal choice, the confusion of the concept of logical relationship, the cumbersome stacking of reduplication processing, and the ontology misunderstanding of cultural images, its root lies in the text generation mechanism of the large language model based on statistical probability, which is good at processing "text symbols" but difficult to understand "cultural context", and can copy the surface semantics but difficult to convey the deep artistic conception. These mistranslations are not isolated individual errors, but the structural limitations of AI translation in dealing with the highly concise, implicit and cultural particularity of classical poetry [11]. Facing this reality, scholars need to deeply analyze the cognitive mechanism defects of AI translation, and explore the optimization path of human-computer cooperation and the communication strategy of classical poetry translation, to achieve the organic unity of technical efficiency and humanistic poetry in the intelligent era.

3.1 Cognitive Mechanism and Optimization Path of AI Translation Mistranslation

The failure of AI translation in high-order cognitive tasks is rooted in the working mechanism of large language model: the word prediction based on statistical probability lacks a deep understanding of cultural context, historical background and emotional intention. The large language model lacks a deep understanding of cultural context, historical background and emotional intention. It deals with "literal symbols" rather than "culture". Rui Ma pointed out that the meaning of natural language is formed by the long-term interaction between language and experience, involving the implicit dia-

logue and intertextual understanding between the author and the reader [12]. This process requires the identification and analysis of human intelligence. The "black box" feature of AI translation makes it difficult to "interpret" as human translators do [13]. It should strengthen the training mechanism of the AI model, and let it focus on not only the "symbol" but also the "culture" behind it. Bin Xu pointed out that the key to making good use of AI and achieving a high level of human-computer cooperation is to effectively identify the mistakes in AI translation and recognize the lack of AI in translation [1].

Metadata such as "image tags", "prosodic tags," and "cultural annotations" can be added to Xu Yuanchong's and other classic translations, so that AI can learn translation strategies rather than just translation results. In addition, it can construct a comparative corpus pair of "AI clumsy translation-Manual clever translation", and enhance AI's perception of the overall aesthetics of poetry by strengthening the learning of the types of errors, such as translation being cumbersome and semantic deviation. Multimodal data such as poetry recitation audio and calligraphy visual images, can be introduced.

The triad of "image emotion cultural context" is connected to the model in the form of a knowledge map to realize the interpretable reasoning of cultural symbols. The "theme modeling" module is added to automatically identify the image network of the whole poem before translation and guide the unified strategy of local translation. Hard constraints such as prosodic templates and syllable number limit are introduced to restrict the generation process to poetic norms. The closed loop of "AI preliminary translation expert annotation feedback reinforcement" is designed, and the revision track of translators such as Yuanchong Xu is used as the monitoring signal.

3.2 The Cultivation Strategy of Translation Talents of Classical Poetry

The training of translation talents needs to be updated. To cultivate bilingual talents, it should focus on cultivating high-end translation talents who can use artificial intelligence tools, have extensive knowledge, diverse ideas, rich emotions and proficient language skills, rather than just being satisfied with the training of general skills.

4 Conclusion

This study takes Ruoxu Zhang's *"A Moonlit Night On The Spring River"* as the research object, through the comparative analysis of the differences between Yuanchong Xu's artificial translation and the two AI versions of Doubao and Gemini, systematically investigates the mistranslation phenomenon and cognitive mechanism of AI translation in the English translation of classical poetry. The study finds that the mistranslations of classical poetry are mainly manifested in four dimensions: the stiff translation, the inappropriate semantic expression, the cumbersome translation, and cultural image distortion. Although AI translation performs better than human translation in low-level cognitive tasks, it has systemic defects, which make it difficult to convey the deep cultural artistic conception and emotional resonance, while there are still obvious limitations in high-level cognitive tasks such as cultural image reproduction, creative expression and reader awareness. Based on the above findings, this study proposes that hu-

man-computer collaborative translation should give full play to the efficiency advantage of AI and the cognitive advantage of human translators, and effectively identify and correct the errors and deficiencies of AI translation by constructing a high-level collaborative path of "AI preliminary translation--data retrieval--Manual refinement". The era of artificial intelligence does not eliminate the complexity of classical poetry translation, but highlights the irreplaceable value of human translators--human translators should make good use of AI tools to improve work efficiency, and at the same time, cultivate high-level cognitive fields that need human wisdom, emotion and innovation, so as to realize the ideal of cross-cultural communication. Future research can further explore the cognitive mechanism of AI translation mistranslation, and carry out empirical research on a better mode of human-computer cooperation.

The era of artificial intelligence does not eliminate the complexity of classical poetry translation, but highlights the irreplaceable value of human translators. In the field of translation of classical poetry, human translators should make good use of AI tools to improve work efficiency, and at the same time, cultivate high-level cognitive fields that need human wisdom, emotion, and innovation to realize the ideal of cross-cultural communication.

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