Innovation and Limitation: A Study on English Translation of Su Shi's Poetry from the Perspective of AI Translation

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Abstract: Against the backdrop of rapid advancements in AI translation technology, this article focuses on the highly challenging domain of translating classical Chinese poetry into English. Using Su Shi's poetry as a specific case study, it systematically explores the innovative capabilities and inherent limitations demonstrated by AI translation. The research indicates that AI translation, leveraging its efficient processing capacity, consistent terminology management, big data pattern recognition, and multimodal generation potential, has brought significant process optimization and tool-based innovation to classical poetry translation. However, in-depth analysis grounded in cultural translation theory and hermeneutics reveals structural deficiencies in AI's ability to poetically reconstruct artistic conception, deeply interpret cultural connotations, flexibly transform linguistic artistry, and particularly in executing "creative rebellion"—a core competency of literary translation. Through comparative analysis, this paper argues that relying solely on AI cannot independently achieve high-quality poetry translation. Ultimately, the study proposes establishing a collaborative workflow model centered on human translators with AI serving as deep-level assistance. By leveraging complementary strengths between humans and machines, this approach aims to achieve dual enhancements in efficiency and artistic quality for classical Chinese poetry translation into English, offering a practical pathway for the effective and profound dissemination of Chinese culture abroad.

Keywords: AI translation; Su Shi's poetry; English translation; innovation; limitations; human-machine collaboration

1. Introduction

Su Shi stands as a towering figure in Chinese literary history, whose poetry and lyrics blend Confucian, Buddhist, and Taoist philosophies, embodying both majestic grandeur and profound philosophical depth. Translating his works into English serves as a vital practice for promoting the dissemination of Chinese culture abroad and fostering dialogue between Chinese and Western civilizations. However, poetry translation has long been regarded as "the most difficult task in translation." Its ethereal imagery, condensed symbols, exquisite rhythms, and profound cultural layers create formidable artistic barriers.

The rise of artificial intelligence translation technology is profoundly reshaping the landscape of translation. From manual translation to computer-assisted translation and now AI translation, technological evolution has not only boosted efficiency but also prompted a fundamental reexamination of translation's essence: When algorithms encounter highly

artistic texts like Su Shi's poetry, where do their capabilities reach their limits? This question stands as a core issue straddling technology and humanities[1].

To systematically explore this issue, this study adopts a theoretical framework grounded in cultural translation theory and hermeneutics, focusing specifically on the English translation of Su Shi's poetry[2]. It aims to clarify the innovative potential and inherent limitations brought by AI translation, while exploring optimized pathways for human-machine collaboration. The significance of this research is articulated across four dimensions: practically, it seeks to delineate the appropriate role of AI within the poetry translation workflow; educationally, it aims to establish a reference framework for cultivating translators' technological proficiency and humanistic discernment; in terms of dissemination, it encourages critical reflection on the depth and authenticity of technology-facilitated cultural transmission; technologically, it provides humanistically informed insights to guide the development of AI models endowed with enhanced "literary intelligence."

The structure follows a "Manifestation-Limitations-Integration" logic. First, it dissects AI translation's innovative performance in translating Su Shi's poetry into English. Next, it critically examines its fundamental limitations across dimensions of artistic conception, cultural context, linguistic adaptation, and creative expression.

Finally, based on comparative analysis, it proposes concrete pathways for constructing a new human-machine collaborative translation model, aiming to provide practical theoretical references and implementation strategies for the modern translation and cross-cultural dissemination of classical poetry.

2. Innovative manifestations of ai translation in the english translation of su shi's poetry

The entry of AI translation into classical poetry transcends mere tool-based acceleration, introducing a series of innovative characteristics rooted in its underlying technological logic[2,3]. These traits are redefining certain segments of the translation workflow.

2.1. Efficiency and Mass-processing capabilities

In an era of information explosion and unprecedented demand for cultural exchange, translation timeliness is paramount. AI translation engines like GPT, Google Translate, and DeepL can produce initial translations of lengthy texts in near real-time. For research or publishing projects involving the voluminous Complete Works of Su Shi, AI can generate a comprehensive English draft in minimal time. This offers unprecedented convenience for scholars conducting panoramic stylistic analyses and publishers assessing translation workloads. For instance, if researchers wish to quickly survey the overall thematic tendencies of Su Shi's poetry from his Lingnan period, AI translation can instantly generate "reference-level" translations of hundreds of poems. While lacking depth, these translations delineate focal points for subsequent human close reading and selection, significantly enhancing the efficiency of initial academic exploration.

2.2. Consistency management of terminology and culturally-loaded terms

Su Shi's poetry abounds with proper nouns, historical allusions, philosophical concepts, and culturally-specific imagery (e.g., "Red Cliff," "Dongpo Pork," "straw cloak and bamboo hat," "fleeting life"). Manual translations may exhibit inconsistencies in handling these terms across different translators or even by the same translator at different times. Leveraging its built-in terminology database and robust contextual alignment capabilities, AI translation automatically maintains high consistency in key term translations throughout the entire text. For example, if "乌台诗案" is anchored as "the Crow Terrace Poetry Case" in its training corpus, this translation will be consistently applied throughout the entire text. Such consistency is crucial for academic works, textbook compilation, or establishing standardized cross-cultural research databases, helping to form stable, unified cultural concept references in the English-speaking world.

2.3. Big data-driven pattern recognition and translation option generation

This represents the core innovation where AI translation surpasses traditional computer-assisted translation. Through deep learning within massive bilingual parallel corpora (including extensive existing English translations of classical Chinese poetry), AI identifies high-frequency translation patterns for specific poetic structures, rhetorical devices, or clusters of imagery. For instance, when processing the imagery of "bright moon," AI not only offers the literal translation "bright moon" but may also, based on corpus statistics, suggest alternatives like "luminous moon" or "clear moon."

In certain contexts expressing longing, it might even associate "the moon" as an emotional symbol. This provides translators with a "spectrum of possible options" grounded in historical translation practices, thereby inspiring or validating their decisions. When encountering complex techniques like 'parallelism' or "allusions," while AI may struggle to perfectly replicate them, it can identify patterns and alert translators to structural features requiring special attention.

2.4. Potential for multimodal translation and cross-media reproduction

The new generation of AI transcends mere text conversion, evolving into multimodal systems integrating natural language processing, image recognition/generation, and speech synthesis. This capability unlocks hypertextual possibilities for translating and disseminating Su Shi's poetry. For instance, when translating the "poetry-as-painting" masterpiece "Spring River Evening Scene" by Hui Chong, AI could automatically generate a series of visual keywords or brief scene descriptions aligned with the poetic imagery based on the translation of lines like "Beyond the bamboo, a few peach blossoms; / The spring river warms, and ducks know first." It could even directly invoke image generation models to create accompanying illustrations.

Furthermore, it can provide voice recitations for English translations of poetry and adjust the intonation and rhythm of the recitation through emotional analysis. This integrated "text-image-sound" translation output significantly enriches the dimensions of poetry reception, particularly aligning with contemporary digital and visual communication ecosystems. It offers new pathways for classical poetry to attract broader, especially younger, foreign audiences.

2.5. As an "unwearying comparative reader" and "counter-perspective"

AI can instantly retrieve and compare multiple classic human translations stored in its database (e.g., Xu Yuanchong, Watson, Lin Yutang). When a translator deliberates over a particular line, AI can simultaneously present various historical solutions and analyze the similarities and differences in their word choices and syntactic structures.

This allows translators to quickly stand on the shoulders of giants for review, rather than starting from scratch. More importantly, AI-generated translations—often appearing stiff or peculiar—serve as a valuable "counter-perspective." Their errors or shortcomings starkly reveal which poetic elements (such as rhyme, puns, or cultural presuppositions) remain elusive to current algorithmic models. This, in turn, compels translators to delve deeper into the original poem's subtleties and the necessity of creative interpretation.

3. Analysis of AI translation limitations in translating su shi's poetry into english

Despite AI translation's remarkable technical capabilities, its mechanical nature exposes structural flaws when confronting poetry—the pinnacle of linguistic artistry.

These limitations prevent it from independently producing high-quality poetic translations.

3.1. Flattened conveyance of "yijing" and absence of rhythmic sensibility

The core aesthetic concept of classical Chinese poetry, "yi jing" (意境), embodies an infinite imaginative space born from the fusion of emotion and scenery, where the tangible and intangible intertwine[4]. AI translation is incapable of capturing this, as its operation relies on statistical correlations between words and sentences rather than the perception and recreation of the overall artistic atmosphere. Take the opening lines of "Nian Nu Jiao: Reminiscences of the Red Cliffs"

as an example: Human translators (such as Xu Yuanchong's rendering: "The endless river eastward flows; / With its huge waves are gone all those / Gallant heroes of bygone years.") employ words like "endless," "huge waves," "gallant heroes," and "bygone years," alongside techniques like inversion and line breaks, to recreate the vastness of time and space and the sense of historical vicissitudes. AI literal translations, however, often yield something like "The great river flows east, the waves wash away all the romantic figures through the ages." Such versions feature mundane vocabulary ("romantic figures" offers a superficial interpretation of " 风流人物 "), flat sentence structures, and a complete loss of the original's rhyming scheme and rhythmic cadence. The majestic imagery is compressed into a bland, uninspired statement.

3.2. Mechanical interpretation of cultural connotations and lack of contextual knowledge

Su Shi's poetry serves as a microcosm of Chinese culture, rich with historical allusions, philosophical concepts, and cultural customs. AI translation lacks genuine cultural understanding, relying solely on surface-level linguistic correspondences, which often results in "cultural loss" or "misinterpretation." The most illustrative example is the line "Holding the festival in Yunzhong, when will Feng Tang be sent?" from "Jiangchengzi: Hunting in Mizhou." This phrase originates from the Records of the Grand Historian, where Feng Tang held the imperial banner to pardon Wei Shang.

Su Shi employed it to express his yearning for imperial recognition. AI translation might render this as "Holding the festival in Yunzhong, when will Feng Tang be sent?"—completely losing the political metaphor and personal sentiment behind the allusion. For readers unfamiliar with Chinese history, the line becomes meaningless and baffling. Human translators must compensate through annotations, paraphrasing, or cultural substitutions, as seen in Watson's translation which added explanatory elements.

3.3. Lack of flexibility and creativity in poetic language

Poetic language is intensely condensed and highly malleable, often defying conventional grammar through word-class conversion, special sentence structures, and double entendres. AI struggles to handle these phenomena. For instance, Wang Anshi's "The spring wind again greens the south bank of the river" employs the character " 绿 " (lǜ) as a verb—a masterclass in word refinement. Human translators must creatively seek English equivalents that convey this dynamic and chromatic sensation (e.g., "green" as a verb). AI, however, is likely to render it stiffly as "The spring wind again greens the south bank of the river." While grammatically feasible, this treatment diminishes the poetic essence and may not align with common collocations in its training corpus. AI is virtually incapable of handling wordplay involving puns, homophones, or other linguistic devices.

3.4. Misunderstandings in emotional and stylistic interpretation

Poetry serves as a vessel for emotions, and Su Shi's verse spans an exceptionally wide emotional spectrum—from the expansive grandeur of "The Red Cliff Rhapsody" to the profound sorrow and lamentation of Jiang Chengzi: A Dream Recorded on the Twentieth Night of the First Month in the Year of Yi Mao." AI, lacking emotional experience, can only make probabilistic judgments through textual sentiment analysis models, making it highly prone to misinterpretation. It might label "Nian Nu Jiao: Reminiscences of the Red Cliffs" as "bold and unconstrained," yet struggle to grasp the complex emotions behind lines like "My tender heart should laugh at me, for my hair has turned white too soon"—a blend of heroic spirit and self-mockery, ambition and melancholy. More crucially, AI cannot comprehend or reproduce Su Shi's unique personal essence—a fusion of Confucian, Taoist, and Buddhist philosophies—nor his literary style. Its translations often become "averaged out" and "de-stylized," lacking the warmth of human character.

3.5. The fundamental lack of "creative rebellion"

Literary translation, especially poetry translation, often requires "creative rebellion"—actively deviating from literalism to achieve artistic equivalence in the target language through re-creation. This represents the highest expression of the translator's agency.

Xu Yuanchong's translation of " 不爱红装爱武装 " as "To face the powder and not to powder the face," leveraging the double meaning of 'powder' (gunpowder/cosmetics), exemplifies classic creative rebellion. AI translation, at its core, is "high-fidelity" probabilistic prediction and reproduction. Its goal is to "resemble existing standard translations," not to "create a new, superior artistic possibility." It lacks the impulse to rebel and possesses no aesthetic judgment for creation. Consequently, it can only produce "correct" or "coherent" translations, yet struggles immensely to yield 'brilliant' or "vivid" ones.

4. AI translation vs. human translation: contrast, complementarity, and the new paradigm of human-machine collaboration

Given AI translation's innovative potential and inherent limitations, the future of classical poetry translation lies not in "human-machine opposition" but in "human-machine symbiosis." Establishing a complementary collaborative workflow is the essential path to enhancing the quality and efficiency of translating Su Shi's poetry—and indeed all Chinese classical literature—into foreign languages.

4.1. Comparative summary: core complementary advantages

Human translation remains irreplaceable in its core competencies, which are deeply rooted in uniquely human faculties. These include a profound understanding and nuanced interpretation of cultural, historical, and philosophical contexts; the exercise of aesthetic judgment and genuine poetic creativity; a capacity for emotional resonance and mastery of stylistic subtleties; the deliberate and skilled application of "creative treason" to achieve artistic equivalence; and the inherent assumption of ethical and cultural responsibility throughout the translation process.

In contrast, the core strengths of AI translation are predominantly technical and augmentative. They lie in its unparalleled speed and scalability for generating initial drafts, its systematic enforcement of terminological and expressive consistency, its instant retrieval and suggestion capabilities drawn from vast translation memories, its auxiliary function in producing and synchronizing multimodal content, and its ability to provide translators with a broad spectrum of linguistic and stylistic reference options.

4.2. Building a human-machine collaborative poetry translation workflow

An ideal collaborative model is not a simple "AI draft + human polish," but rather a deeply interactive, cyclical, and iterative organic process:

4.2.1. Initial phase: AI-assisted exploration and preparation

The translator inputs the original poem, and AI rapidly generates 1-3 drafts with distinct stylistic orientations (e.g., literal, interpretive, rhyming) to establish a preliminary semantic framework.

The translator utilizes AI's retrieval function to quickly look up existing translations, parallel texts, and cultural background materials for keywords (e.g., specific allusions, place names), forming a translation plan.

4.2.2. Mid-stage: Human-led in-depth translation and decision-making phase

Drawing on their deep understanding of the original poem, translators critically examine AI drafts, using them as "dialogue partners" or "counterexamples" to spark inspiration.

When encountering challenges with specific phrasing or imagery conversion, translators proactively query AI for diverse lexical or structural options as references. However, final aesthetic choices and creative decision-making remain firmly in the translator's hands.

For challenges where AI clearly falters (e.g., puns, complex allusions), the translator independently performs cultural compensation and artistic creation.

4.2.3. Post-production: Human-AI collaborative verification, polishing, and interpretation phase

After completing the refined human translation, AI can be re-employed for consistency checks (ensuring uniform terminology throughout), basic grammar and spelling proofreading, thereby reducing the translator's mechanical workload.

Leveraging AI's multimodal capabilities, generate drafts of image keywords, audio recitations, or simple cultural annotations for the finalized translation. These serve as revision points for the translator, enriching the presentation format of the translated work.

Translators craft in-depth prefaces, introductions, and detailed annotations. These sections, reflecting the translator's scholarly expertise and unique insights, are entirely human-produced.

4.3. Implications for translation education and industry ecosystem

4.3.1. Translation education reform: future training for poetry translators must integrate "AI literacy" into core curricula.

Students should be taught not only "how to translate" but also "how to collaborate with AI for translation"—including skills to effectively instruct AI, critically evaluate AI outputs, and engage in deep creative work with AI assistance. Cultivating profound humanities literacy will be more crucial than ever, as it remains the irreplaceable foundation for human translators.

4.3.2. Industry ecosystem evolution

Translation project managers may adopt a "human-machine collaboration" team model, utilizing AI as a tool for standardized draft generation and terminology management. Senior translators would serve as artistic directors and final reviewers, leading teams in deep refinement and quality control. This approach may give rise to a new "translation reviewer" role, whose core task is to elevate the literary quality of AI outputs.

5. Conclusion

This study explores both innovations and limitations in the specific domain of Su Shi's poetry translation into English within the AI translation landscape. Findings reveal that AI translation, through its efficiency, consistency, big-data pattern recognition, and multimodal potential, brings process innovation and tool-based empowerment to classical poetry translation. It efficiently produces semantically reliable drafts, manages complex cultural terminology, and offers rich references for translation possibilities, thereby freeing translators from mechanical labor to focus on higher-level creative tasks.

However, this study reveals more profoundly that due to the lack of genuine cultural understanding, aesthetic experience, historical consciousness, and creative motivation, AI translation faces fundamental, structural limitations in areas such as the poetic reconstruction of artistic conception, the deep interpretation of cultural connotations, the flexible transformation of linguistic forms, the precise grasp of complex emotions, and the crucial "creative rebellion." It excels at handling poetry's "framework" (basic information) but struggles to recreate its "soul" (artistic essence) and "vitality" (cultural life). Case studies demonstrate that the most outstanding literary translations remain crystallizations of human wisdom and artistic sensitivity[5].

Therefore, the future of translating Su Shi's poetry into English—indeed, the future of literary translation as a whole—is not a "human-machine showdown," but rather a journey toward deep integration: "human-machine symbiosis." The key pathway lies in establishing a new collaborative translation model where human translators remain central, supported by AI as an intelligent assistant. In this model, AI's value lies in expanding human capabilities and enhancing foundational efficiency, while human translators contribute irreplaceable cultural insights, aesthetic judgments, and artistic creativity beyond AI's reach. Only by organically integrating AI's "technique" with human "artistry" can we, in the digital age, more efficiently, profoundly, and compellingly convey the spiritual worlds of Chinese literary giants like Su Shi to

global readers—truly achieving deep dialogue and resonance between civilizations. This represents both the inheritance and innovation of traditional translation craftsmanship and an active practice of upholding humanistic values amid the technological tide.

Disclosure statement

The author declares no conflict of interest.

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