

UZBEKISTAN

LANGUAGE & CULTURE

O'ZBEKISTON

TIL VA MADANIYAT

ISSN 2181-922X

2026 Vol. 2

tsuull.uz
uzlc.tsuull.uz

ISSN 2181-922X

O‘ZBEKISTON:

TIL VA MADANIYAT

UZBEKISTAN:

LANGUAGE AND CULTURE

2026 Vol. 2

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Evaluating Human and AI-Based Translation of Uzbek Classical Poetry: A Comparative Analysis of Alisher Navoi's "*Qaro Ko'zim*"

Muhayyo Abdulhakimova¹

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Abstract

The study confirms that while AI-based translation systems have made substantial progress in linguistic fluency and semantic interpretation, they remain limited in translating culturally rich poetic texts. Human translators continue to play an essential role in preserving literary meaning and artistic expression. The findings contribute to the growing field of AI-assisted literary translation and provide insights into translation challenges in low-resource languages such as Uzbek.

Key words: *AI translation, Alisher Navoi, literary translation, machine translation, poetry translation, Uzbek classical poetry.*

Introduction

The rapid advancement of artificial intelligence (AI) has significantly transformed the field of translation studies, particularly through the development of machine translation (MT) technologies. Contemporary tools such as Google Translate, DeepL Translator, and AI-based large language models have made translation faster, more accessible, and increasingly context-sensitive. The transition from rule-based and statistical approaches to neural machine translation (NMT) has substantially improved translation fluency, semantic coherence, and contextual processing (Tan et al., 2020; Forcada, 2020; Zhang & Zong, 2020). Recent studies further demonstrate that

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For citation: Abdulhakimova M., Feng Ruizhen. 2026. "Evaluating Human and AI-Based Translation of Uzbek Classical Poetry: A Comparative Analysis of Alisher Navoi's "*Qaro Ko'zim*". *Uzbekistan: Language and Culture* 2: 167 – 200.

AI-assisted translation technologies are becoming deeply integrated into professional translation workflows, multilingual communication, and academic research environments (Gaspari & Hutchins, 2021; Ji, 2020).

Despite these technological advancements, machine translation systems continue to face considerable limitations when processing linguistically and culturally complex texts. Although NMT systems are capable of generating grammatically fluent outputs, scholars argue that they frequently fail to preserve deeper semantic meaning, metaphorical structures, emotional nuance, and contextual subtleties (Okpor, 2014; Almahasees, 2021; Bouguesmia, 2020). Figurative language and metaphorical expressions remain among the greatest challenges for AI-generated literary translation because they often require interpretative and culturally informed understanding beyond lexical equivalence (Rossi, 2023). Furthermore, research on low-resource languages demonstrates that neural translation systems often struggle due to insufficient parallel corpora, limited linguistic datasets, and restricted cultural modeling capabilities (Deng & Liu, 2021).

Among literary genres, poetry remains one of the most difficult forms to translate because it relies heavily on stylistic and aesthetic elements such as rhythm, rhyme, symbolism, imagery, and emotional resonance. These poetic features are deeply embedded within cultural and linguistic traditions, making direct translation particularly challenging. According to the theory of Dynamic Equivalence, literary translation should preserve not only lexical meaning but also communicative and emotional effect. Similarly, Zhang (2013) emphasizes that an ideal translation must achieve “faithfulness, expressiveness, and elegance,” principles that remain difficult for machine translation systems to maintain consistently. Recent studies further demonstrate that even advanced AI systems continue to encounter difficulties in preserving poetic structure, metaphorical depth, and aesthetic coherence in literary translation (Toral & Way, 2021; Kenny, 2022). Kenny (2022) additionally argues that literary translation requires creativity, interpretative sensitivity, and ethical awareness that cannot easily be replicated by artificial

intelligence systems.

Recent comparative studies between human and machine translation further highlight these limitations. Moorkens (2022) demonstrates that although machine translation systems can achieve high lexical accuracy and fluency, they often fail to preserve stylistic consistency and emotional depth in literary texts. Similarly, Castilho (2020) emphasizes that traditional automatic evaluation metrics remain insufficient for assessing literary translation quality because aesthetic and cultural dimensions cannot be fully measured through purely computational methods. These findings suggest that literary translation requires not only linguistic equivalence but also cultural competence and interpretative understanding.

In the context of Uzbek literature, these challenges become even more significant. The increasing role of English as a global language has intensified the need for accurate and culturally sensitive translation of Uzbek literary heritage into English (Hasanova, 2021). However, Uzbek remains a low-resource language in the field of artificial intelligence and machine translation. As highlighted by Raxmanova (2024), structural differences in syntax, morphology, and culturally bound expressions substantially affect translation quality in Uzbek-English translation. Recent studies further indicate that AI systems frequently encounter difficulties in maintaining cultural equivalence and symbolic meaning when translating literary texts from less-resourced languages (Wang & Sun, 2024).

The works of Alisher Navoi provide a particularly important case for examining these issues. Navoi's poetry is characterized by sophisticated rhyme schemes, symbolic imagery, philosophical depth, and rich metaphorical language. According to Geldiyeva (2022), translating Navoi's works into English requires a high level of linguistic competence, literary sensitivity, and cultural interpretation. Similarly, Shermamatova (2024) argues that many existing translations fail to preserve the artistic richness and emotional intensity of Navoi's ghazals. These difficulties are especially evident in the translation of metaphorical and polysemous expressions, which often require interpretative understanding beyond literal

equivalence.

Although recent developments in AI-assisted translation have improved the quality of automated translation systems, research continues to demonstrate substantial differences between human and machine translation in literary contexts. Human translators possess interpretative flexibility, cultural awareness, and creative sensitivity that AI systems still struggle to replicate fully (Vieira, 2020; Moorkens, 2022). At the same time, recent scholarship suggests that advanced AI systems may increasingly function as supportive tools in literary translation rather than complete replacements for human translators (Gupta & Sharma, 2023).

Despite the growing body of research on machine translation and literary translation studies, there remains limited comparative research focusing specifically on Uzbek classical poetry. Most previous studies either examine the technical development of machine translation systems or focus exclusively on literary interpretation without integrating both perspectives. Therefore, this study addresses this research gap by conducting a comparative analysis of human and machine translations of Alisher Navoi's ghazal "*Qaro Ko'zim*" ("My Dark-Eyed One"). By combining qualitative and semi-quantitative approaches, the study evaluates translation quality in terms of semantic accuracy, poetic preservation, metaphor transfer, and cultural equivalence. In doing so, the research contributes to the growing field of AI-assisted literary translation and expands scholarly discussion on translation practices in low-resource languages.

Literature Review

Machine Translation and AI Systems

The development of machine translation (MT) has become one of the most significant advancements in natural language processing and translation studies. Over recent decades, the transition from rule-based and statistical approaches to neural machine translation (NMT) has fundamentally transformed translation technologies. NMT systems rely on deep learning architectures, including encoder-decoder frameworks and attention

mechanisms, significantly improving translation fluency, semantic coherence, and contextual consistency (Tan et al., 2020; Zhang & Zong, 2020). According to Forcada (2020), neural machine translation represents a major technological shift by enabling more adaptive and context-aware translation outputs.

Recent studies further indicate that AI-assisted translation technologies are increasingly integrated into both professional and academic translation environments (Gaspari & Hutchins, 2021). However, despite these technological improvements, numerous scholars emphasize that machine translation systems continue to face serious limitations when processing linguistically complex and culturally embedded texts (Almahasees, 2021; Bouguesmia, 2020). Popović (2020) notes that semantic loss, contextual inconsistency, and stylistic distortion remain among the most common challenges in neural machine translation evaluation, particularly in literary contexts.

AI and Literary Translation

The growing application of artificial intelligence in literary translation has attracted considerable scholarly attention in recent years. A bibliometric analysis of Scopus-indexed studies demonstrates a rapid increase in research related to AI and literary translation after 2020, reflecting the interdisciplinary expansion of this field (Zulkifli et al., 2025). Nevertheless, researchers continue to argue that AI systems remain limited in their ability to preserve literary nuance, emotional tone, metaphorical meaning, and cultural symbolism (Abdelhalim et al., 2025; Yang, 2022; Bizjak, 2024).

Among literary genres, poetry is widely considered one of the most difficult forms to translate because it requires the preservation of both semantic meaning and formal poetic structures such as rhyme, rhythm, imagery, and symbolism. According to Zhang (2013), effective literary translation should achieve “faithfulness, expressiveness, and elegance,” principles that remain difficult for machine translation systems to maintain consistently. Similarly, Kenny (2022) argues that literary translation requires creativity, interpretative sensitivity, ethical awareness, and aesthetic judgment

that cannot easily be replicated by artificial intelligence systems.

Recent comparative studies between human and machine translation further highlight these limitations. While Toral and Way (2021) emphasize the fluency improvements achieved by neural machine translation systems, they also demonstrate that AI-generated literary translations still struggle with figurative language and stylistic sensitivity. Moorkens (2022) similarly argues that although machine translation systems may achieve high lexical accuracy, they often fail to preserve emotional depth and stylistic coherence in literary texts. Rossi (2023) further identifies metaphor translation as one of the greatest challenges for AI-generated literary translation because metaphorical interpretation frequently requires contextual and culturally informed understanding beyond literal equivalence.

Translation Evaluation and Comparative Approaches

Research on machine translation evaluation frameworks suggests that traditional automatic metrics such as BLEU remain insufficient for assessing literary translation quality because they cannot adequately measure aesthetic, stylistic, and cultural dimensions (Gümüş Sirkintı, 2025). As a result, scholars increasingly rely on combined qualitative and quantitative evaluation methods when analyzing literary translation (Castilho, 2020). Comparative approaches between human and machine translation are now widely recognized as reliable methodologies in translation studies because they enable deeper analysis of semantic accuracy, stylistic preservation, and interpretative quality (Moorkens, 2022).

Recent empirical studies also demonstrate important differences among AI-based systems. Manapbayeva (2024) found that although AI systems may produce grammatically fluent outputs, they often fail to preserve poetic coherence and emotional resonance. Similarly, Kuzman (2019) and Sirkin (2025) emphasize that systems such as Google Translate and DeepL Translator frequently struggle to preserve metaphorical meaning, symbolic imagery, and poetic structure in literary texts.

Uzbek Classical Poetry and Translation Challenges

In the context of Uzbek-English translation, these challenges become even more significant because Uzbek remains a low-resource language in artificial intelligence and machine translation research. The limited availability of large-scale parallel corpora significantly affects the development of high-quality NMT systems for Uzbek literary translation (Deng & Liu, 2021). Raxmanova (2024) additionally highlights that differences in syntax, morphology, and culturally bound expressions substantially influence translation quality in Uzbek-English translation.

The works of Alisher Navoi represent a particularly complex case in literary translation studies. Navoi's poetry contains sophisticated rhyme schemes, symbolic imagery, philosophical concepts, and metaphorical expressions that require both linguistic expertise and cultural interpretation. According to Geldiyeva (2022), translating Navoi's works into English demands a high level of interpretative competence and literary sensitivity. Shermamatova (2024) similarly argues that many existing translations fail to preserve the emotional intensity and artistic richness of Navoi's ghazals, especially when translated into Western languages.

Previous studies have also identified inconsistencies in existing translations of "*Qaro Ko'zim*," particularly in conveying metaphorical meanings, symbolic references, and polysemous expressions (Shermamatova, 2024). From a broader perspective, Shin (2017) emphasizes Navoi's role in shaping Uzbek literary identity, highlighting the cultural importance of preserving his works through accurate and culturally sensitive translation. Yo'ldoshev (2021) additionally identifies structural variations within Navoi's ghazals, further increasing the complexity of translation processes.

Investigating AI-assisted translation in Uzbek classical poetry is not only important for preserving national literary heritage but also contributes to broader discussions on the capabilities and limitations of machine translation in low-resource and culturally complex languages. Despite the growing body of research on machine translation and literary translation studies, there remains limited comparative research focusing specifically on Uzbek classical

poetry. Most previous studies either examine the technical development of MT systems or focus exclusively on literary interpretation without integrating both perspectives.

Therefore, this study addresses this research gap by conducting a comparative analysis of human and machine translations of Alisher Navoi's ghazal "*Qaro Ko'zim*" ("My Dark-Eyed One"). By integrating qualitative and semi-quantitative evaluation methods, the study evaluates translation quality in terms of semantic accuracy, poetic preservation, metaphor transfer, and cultural equivalence, thereby contributing to the growing field of AI-assisted literary translation and expanding scholarly discussion on translation practices in low-resource languages.

Research Method

This study adopts a comparative mixed-methods approach to examine the differences between human and machine translation in the context of Uzbek classical poetry. The research combines qualitative analysis, aimed at interpreting semantic meaning, stylistic features, metaphorical structures, and cultural elements, with quantitative assessment used to evaluate translation quality through measurable evaluative criteria.

The comparative framework is designed to investigate how different translation approaches preserve both the linguistic and aesthetic dimensions of poetic texts. The study is theoretically grounded in Dynamic Equivalence theory, which emphasizes the preservation of communicative and emotional effect in translation, and Skopos Theory, which focuses on the purpose and functional adequacy of translation within the target-language context.

This study addresses the following research questions:

1. To what extent can machine translation systems reproduce the rhyme schemes, meter, imagery, and stylistic features of the Uzbek poem "*Qaro Ko'zim*" ("My Dark-Eyed One")?
2. How effectively do AI-based translation systems preserve culturally specific references, metaphorical expressions, and symbolic meanings in Uzbek classical poetry?

3. How do the stylistic and interpretative choices of human translators differ from those generated by machine translation systems in preserving poetic voice and emotional resonance?

Research Materials

The primary research material of this study is the ghazal “*Qaro Ko’zim*” (“My Dark-Eyed One”) by Alisher Navoi, one of the most influential figures in Uzbek classical literature (Shin, 2017). The poem is included in Navoi’s collection *Hazoyin ul-Maoni* and consists of eight bayts (couplets), although some studies identify minor structural variations within different manuscript traditions (Yo’ldoshev, 2021).

For comparative analysis, four translation versions were selected:

A published human translation by Dinara Sultanova (2015) from *Selected Gazals of Navoiy* (Musoeva, 2015)

A translation generated by Google Translate

A translation produced by DeepL Translator

A translation generated using ChatGPT as an AI-based large language model

The human translation by Dinara Sultanova (2015) was used as the benchmark for comparison due to its literary orientation and published status. The inclusion of these translation systems enables a comparative evaluation of human translation, traditional neural machine translation systems, and advanced AI-based language models.

Data Collection and Corpus Preparation

The original Uzbek text was obtained from an authoritative literary source to ensure textual reliability. All machine translation outputs were generated under controlled conditions using the same source text and equivalent translation prompts to maintain

procedural consistency. The translations were aligned at the bayt (couplet) level to facilitate systematic comparison across all versions.

The collected translations were subsequently organized into a parallel corpus, enabling direct comparative analysis of corresponding poetic lines, metaphorical expressions, and stylistic structures. This corpus-based organization also improved consistency during both qualitative interpretation and quantitative evaluation.

Analytical Framework

To ensure systematic evaluation, this study employs a multi-dimensional analytical framework focusing on both linguistic and poetic dimensions of translation quality.

The analysis is based on the following five evaluative criteria:

	Semantic Accuracy	preservation of the original semantic meaning
	Rhyme Preservation	maintenance of rhyme patterns and poetic sound structure
	Meter Preservation	reproduction of rhythmic and structural features
	Metaphor and Imagery Transfer	successful rendering of figurative language and symbolic imagery
	Cultural Equivalence	representation of culturally specific concepts and contextual meanings.

These criteria were adapted from established literary translation theories and previous comparative studies on machine translation evaluation (Castilho, 2020; Moorkens, 2022).

Quantitative Assessment

To complement qualitative interpretation, a five-point Likert

scale was employed to evaluate each translation according to the selected criteria:

re	Sco	Description
	5	Excellent preservation
	4	Good preservation with minor lost
	3	Moderate preservation
	2	Significant loss
	1	Very poor preservation

Each criterion was applied independently to all selected bayts, and the average scores were calculated to identify broader performance patterns across translation systems.

Reliability and Evaluation Procedure

To improve methodological reliability, the translations were independently evaluated by two bilingual reviewers with academic backgrounds in translation studies and Uzbek-English literary analysis. Any discrepancies in scoring were discussed and resolved through consensus-based evaluation. This procedure helped reduce subjective bias and improve the consistency of the evaluative framework.

Data Analysis Procedure

The analysis was conducted in three stages. First, qualitative analysis was applied to identify differences in meaning, metaphorical interpretation, stylistic preservation, and cultural references. Second, comparative analysis was conducted line-by-line to identify similarities and differences among translation outputs. Finally, quantitative assessment was applied using the predefined evaluation criteria, and the results were presented in tabular form to facilitate comparative interpretation.

Limitations of the Study

Although this study provides detailed comparative insights into AI-assisted literary translation, it is limited by its focus on a single ghazal by Alisher Navoi. Consequently, the findings may not be fully generalizable to all forms of Uzbek classical poetry. Future studies may expand the dataset by including additional poetic works, multiple translators, and broader multilingual corpora.

Results and Discussion

Quantitative Results

The comparative evaluation of translation quality was conducted based on five evaluative criteria: semantic accuracy, rhyme preservation, meter preservation, metaphor and imagery transfer, and cultural equivalence. Each translation version was assessed using a five-point Likert scale to identify broader performance patterns across translation systems.

Table 1. Comparative Evaluation of Translation Quality

Feature	Human	Gooli	DeepL	ChatGPT
Semantic Accuracy	5.0	2.0	4.0	4.2
Rhyme Preservation	4.5	1.0	2.0	3.2
Meter Preservation	4.3	1.0	2.1	3.0
Metaphor & Imagery Transfer	5.0	1.8	3.8	4.3
Cultural Equivalence	5.0	1.2	3.0	4.1
Average	4.76	1.40	2.98	3.76

The results demonstrate that human translation achieved the highest overall performance, followed by ChatGPT, DeepL Translator, and Google Translate. The findings reveal a substantial gap between human and machine translation, particularly in preserving poetic meaning, metaphorical imagery, and cultural depth. These results support previous studies indicating that machine translation systems often achieve grammatical fluency while struggling with literary and figurative language (Toral & Way, 2021; Kenny, 2022).

Comparative Performance of Translation Systems

The findings of this study reveal significant differences between human and machine translation approaches in translating Uzbek classical poetry into English. While machine translation systems demonstrate grammatical fluency and lexical consistency, they remain limited in preserving poetic structure, metaphorical meaning, emotional resonance, and cultural symbolism. These findings support previous studies arguing that AI systems continue to struggle with figurative language and literary complexity (Toral & Way, 2021; Kenny, 2022).

Among the evaluated systems, the human-produced translation achieved the strongest overall performance, particularly in semantic accuracy and cultural equivalence. Google Translate produced the weakest results, frequently generating literal and semantically distorted translations. DeepL demonstrated stronger grammatical fluency but often weakened poetic ambiguity and metaphorical meaning.

ChatGPT showed comparatively stronger contextual interpretation and figurative understanding than other machine translation systems. However, despite these improvements, even advanced AI systems remained limited in reproducing the poetic subtlety, symbolic depth, and philosophical meanings characteristic of Navoi's poetry.

Overall, the findings suggest that although AI-based systems may serve as supportive tools in literary translation, the preservation

of deeper poetic and cultural meaning still depends heavily on human interpretative competence.

Polysemy and Semantic Ambiguity: Evidence from Bayt 1

The opening bayt of Navoi's ghazal presents a major challenge for machine translation due to its polysemous and symbolic language. The key term "mardum" simultaneously refers to both "human" and the "pupil of the eye," creating layered poetic meaning that depends heavily on contextual and cultural interpretation rather than direct lexical equivalence. In classical Uzbek literary tradition, the concept of "mardumliq" also conveys moral and spiritual qualities such as compassion, loyalty, kindness, and human virtue. This additional philosophical dimension significantly increases the complexity of translating the bayt into English.

The human-produced translation preserves much of the emotional and symbolic meaning of the original text. Although the structure appears partially archaic, the translation successfully maintains the intimate connection between the beloved and the speaker's inner emotional world. The imagery of the beloved dwelling within the speaker's eyes symbolically reflects deep devotion, spiritual attachment, and emotional loyalty.

In contrast, Google Translate fails to preserve the polysemous meaning of "mardum" and produces semantically distorted phrases such as "make humanity a study," demonstrating literal lexical processing without contextual understanding. As a result, the symbolic relationship between the eye, human presence, compassion, and emotional devotion is entirely lost. This finding supports previous studies arguing that conventional machine translation systems often struggle with figurative language and culturally embedded semantic structures (Rossi, 2023; Toral & Way, 2021).

DeepL Translator demonstrates comparatively stronger grammatical fluency; however, it weakens the original poetic ambiguity by interpreting "mardumliq" as "bravery." While syntactically coherent, this interpretation shifts the semantic focus away from the emotional, ethical, and metaphorical dimensions of the source text.

Among the evaluated AI systems, ChatGPT demonstrates comparatively stronger contextual interpretation. Its translation partially preserves the emotional symbolism and figurative meaning of the original bayt more effectively than Google Translate and DeepL. Nevertheless, the system introduces interpretative paraphrasing that slightly reduces the lexical precision and poetic compactness characteristic of Navoi's original expression. Furthermore, none of the evaluated machine translation systems fully preserve the deeper philosophical and spiritual dimensions embedded within the concept of "mardumliq."

Overall, the analysis of Bayt 1 demonstrates that polysemy, symbolic ambiguity, and culturally embedded philosophical meanings remain significant challenges for machine translation systems, particularly in low-resource literary languages such as Uzbek. Although advanced AI models increasingly approximate human interpretative strategies, the preservation of layered poetic meaning continues to depend heavily on human cultural and literary competence.

Metaphorical Representation and Emotional Symbolism Bayts 2–3

Bayts 2–3 of Navoi's ghazal contain highly emotional and metaphorical imagery that presents significant challenges for machine translation systems. The poetic expressions in these bayts rely heavily on symbolic associations involving flowers, gardens, blood, and spiritual attachment, all of which carry deep emotional and cultural meanings within classical Uzbek literary tradition.

In Bayt 2, the imagery of the beloved's face as a flower and the lover's soul as a blooming garden reflects idealized beauty and emotional devotion. The human-produced translation preserves much of this poetic atmosphere through expressions such as "flower like face" and "bonnie orchard." Although the translation contains partially archaic phrasing, it maintains the symbolic relationship between beauty, nature, and emotional attachment.

Google Translate produces grammatically understandable output; however, much of the poetic elegance and emotional

resonance is weakened through literal lexical rendering. DeepL demonstrates comparatively stronger fluency but simplifies several metaphorical expressions, reducing the aesthetic richness of the original text. ChatGPT preserves the symbolic imagery more effectively by rendering the heart as a “blooming paradise” and the soul as a flourishing meadow, thereby maintaining stronger emotional and figurative coherence.

Bayt 3 presents an even greater challenge due to its intense metaphorical language. The expression “bag‘ir qonidin hino” symbolically represents extreme love, sacrifice, and emotional suffering, while “jon rishtasi” refers to deep spiritual attachment. The human translation successfully preserves this emotional intensity through the imagery of “heart’s blood” and “threads of my sorrowful soul.”

In contrast, Google Translate demonstrates substantial semantic distortion, producing phrases that fail to preserve the metaphorical structure and emotional meaning of the original bayt. DeepL retains certain lexical correspondences but weakens the symbolic depth of the verse through overly literal interpretation. Among the evaluated AI systems, ChatGPT demonstrates comparatively stronger contextual sensitivity by preserving the imagery of emotional sacrifice and spiritual connection more effectively than traditional machine translation tools. Nevertheless, even ChatGPT introduces interpretative paraphrasing that slightly reduces the poetic compactness and stylistic subtlety of Navoi’s original expression.

Overall, the analysis of Bayts 2–3 demonstrates that metaphorical representation and emotional symbolism remain major difficulties for machine translation systems. While advanced AI models increasingly approximate human interpretation, the preservation of poetic intensity and culturally embedded emotional imagery continues to depend largely on human literary sensitivity and interpretative competence.

Cultural Symbolism and Philosophical Imagery: Evidence from Bayts 4–5

Bayts 4–5 contain culturally embedded philosophical imagery that presents significant challenges for machine translation systems. These verses rely not only on poetic metaphor but also on symbolic references associated with separation, spiritual suffering, devotion, and classical literary tradition. As a result, successful translation requires cultural interpretation in addition to lexical accuracy.

In Bayt 4, the phrase “firoq tog’i” (“mountain of separation”) symbolically represents emotional suffering, longing, and spiritual hardship. The reference to becoming “ko’hkan” alludes to the classical figure Farhod, a legendary lover associated with sacrifice and devotion in Eastern literary tradition. Such culturally embedded symbolism is highly difficult for machine translation systems to preserve because the intended meaning depends heavily on literary and historical context.

The human-produced translation partially preserves this philosophical imagery by maintaining references to separation and suffering. Although some symbolic compactness is reduced, the emotional tone and poetic atmosphere remain relatively intact. In contrast, Google Translate demonstrates severe semantic breakdown, producing literal phrases such as “knead the dough and bake it again,” which completely eliminate the symbolic and philosophical meaning of the original bayt.

DeepL Translator preserves certain lexical elements more accurately than Google Translate; however, the system still fails to reconstruct the deeper literary symbolism associated with “ko’hkan” and the imagery of separation. Among the evaluated AI systems, ChatGPT demonstrates comparatively stronger contextual interpretation by rendering the verse as “make from it another Farhod, the mountain-carver.” Unlike other systems, ChatGPT partially recognizes the cultural and literary reference embedded within the original text, thereby preserving greater symbolic coherence and emotional resonance.

Bayt 5 similarly demonstrates the difficulty of translating culturally layered poetic imagery. The imagery of hair, curls, and union (“visol”) functions not merely as physical description but as symbolic representation of attraction, longing, and emotional

entanglement within classical Eastern poetic tradition. The human translation preserves much of this symbolic atmosphere, while Google Translate again produces overly literal and structurally simplified output. DeepL improves grammatical coherence but weakens the aesthetic subtlety of the original imagery.

ChatGPT demonstrates comparatively stronger figurative interpretation by preserving the symbolic imagery of curls and emotional attraction more effectively than other machine translation systems. Nevertheless, the translation still introduces interpretative expansion that slightly reduces the poetic compactness and stylistic precision characteristic of Navoi's original expression.

Overall, the analysis of Bayts 4–5 demonstrates that culturally embedded symbolism and philosophical imagery remain major limitations for machine translation systems. Although advanced AI models increasingly demonstrate contextual sensitivity, the successful translation of classical Uzbek poetry continues to require literary competence, cultural knowledge, and interpretative awareness beyond direct linguistic equivalence.

*Poetic Structure, Death Imagery, and Spiritual Devotion:
Evidence from Bayts 6–8*

The final three bayts of Navoi's ghazal demonstrate the intricate relationship between poetic structure, emotional devotion, and spiritual symbolism. These verses contain compressed imagery and culturally embedded metaphors that pose significant challenges for machine translation systems. Successful translation requires not only semantic accuracy but also sensitivity to poetic form and symbolic meaning.

Bayt 6 employs the imagery of autumn (xazon) and the gardener (bog'bon) to symbolize the inevitability of decline and separation. Within the classical poetic tradition, the "army of autumn" represents destructive forces that cannot be resisted. The human-produced translation preserves much of this symbolic atmosphere, maintaining both the metaphorical opposition between the garden and autumn and the philosophical acceptance of fate. In contrast, Google Translate renders the verse in a largely literal manner, weakening its symbolic significance and aesthetic impact.

DeepL provides greater grammatical coherence but still fails to capture the deeper metaphorical implications. ChatGPT demonstrates stronger contextual interpretation by preserving the opposition between preservation and destruction, although some poetic compactness is reduced through explanatory phrasing.

Bayt 7 introduces death imagery through the speaker's request to be washed with rosewater and shrouded in rose petals. These images symbolize purity, devotion, and the continuation of love beyond death. The human translation successfully conveys the emotional intensity and symbolic beauty of the original verse. Google Translate reproduces the basic semantic content but loses much of the emotional resonance. DeepL maintains lexical accuracy yet weakens the aesthetic effect through literal rendering. ChatGPT preserves both the emotional and symbolic dimensions more effectively, producing a translation that remains relatively faithful to the spiritual atmosphere of the source text.

Bayt 8 concludes the ghazal with imagery associated with spiritual gathering, poetic inspiration, and the immortalization of devotion. The symbolic reference to the candle of the assembly reflects enlightenment, passion, and artistic expression. The human translation most effectively preserves these layered meanings, while Google Translate generates a semantically unclear rendering. DeepL partially maintains the symbolic structure but loses interpretative depth. ChatGPT demonstrates comparatively stronger figurative understanding; however, it still expands certain expressions and reduces the stylistic conciseness characteristic of Navoi's poetic language.

Overall, the analysis of Bayts 6–8 demonstrates that poetic compression, symbolic imagery, and spiritual devotion remain particularly difficult for machine translation systems. While advanced AI models increasingly approach human performance in semantic interpretation, they continue to struggle with preserving the aesthetic subtlety, cultural symbolism, and philosophical depth of classical Uzbek poetry.

Conclusion

This study examined the comparative performance of human translation, Google Translate, DeepL Translator, and ChatGPT in translating Alisher Navoi's ghazal *Qaro Ko'zim* ("My Dark-Eyed One") from Uzbek into English. Using a mixed-methods approach that combined qualitative literary analysis with quantitative evaluation, the research assessed translation quality in terms of semantic accuracy, rhyme preservation, meter preservation, metaphor and imagery transfer, and cultural equivalence.

The findings demonstrate that human translation achieved the highest overall performance across all evaluative criteria. The human-produced translation most effectively preserved the emotional depth, symbolic richness, cultural references, and artistic nuances embedded in Navoi's poetry. Among the machine translation systems, ChatGPT demonstrated the strongest performance, particularly in contextual interpretation and figurative language processing. DeepL showed moderate success in preserving grammatical fluency, while Google Translate frequently produced literal translations that weakened metaphorical and cultural meaning.

The analysis further revealed that polysemy, metaphorical imagery, philosophical symbolism, and culturally specific references remain major challenges for AI-based translation systems. Although recent advances in artificial intelligence have significantly improved translation quality, current systems still struggle to reproduce the interpretative sensitivity and literary competence required for translating classical poetry.

This study contributes to the growing field of AI-assisted literary translation by providing empirical evidence from Uzbek classical poetry, a low-resource literary domain that remains underrepresented in translation technology research. The findings suggest that AI systems can serve as valuable supportive tools for literary translation; however, the preservation of deeper poetic meaning continues to depend largely on human cultural knowledge, creativity, and interpretative expertise. Future research may expand the analysis to additional poetic works, multiple translators, and broader multilingual datasets in order to further explore the evolving

relationship between artificial intelligence and literary translation.

The complete original text and all translation versions analyzed in this study are presented in Appendix A.

Ethical Statement

This study did not involve human participants, personal data, or experimental procedures requiring ethical approval. All materials analyzed in this research were publicly available literary texts and machine-generated translations. The authors declare that the study was conducted in accordance with accepted academic and ethical standards.

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Appendix A. Comparative Translation Corpus of Alisher Navoi’s “*Qaro Ko’zim*”

Original

Qaro ko’zum, kel-u, mardumliq emdi fan qilg’il,
Ko’zum qarosida mardum kibi vatan qilg’il.

Yuzung guliga ko'ngul ravzasin yasa gulshan,
Qading niholig'a jon gulshanin chaman qilg'il.

Takovaringg'a bag'ir qonidin hino bog'la,
Itingg'a g'amzada jon rishtasin rasan qilg'il.

Firoq tog'ida topilsa, tufroqim, ey charx,
Xamir etib yana ul tog'da ko'hkan qilg'il.

Yuzung visolig'a yetsun desang ko'ngullarni,
Sochingni boshtin-ayoq chin ila shikan qilg'il.

Xazon sipohig'a, ey bog'bon, emas mone',
Bu bog' tomida gar ignadin tikan qilg'il.

Yuzida terni ko'rub, o'lsam, ey rafiq, meni
Gulob ila yuv-u, gul bargidin kafan qilg'il.

Navoiy, anjumane shavqi jon aro tuzsang,
Aning boshhoqliq o'qin sham'i anjuman qilg'il.

Human translation (Dinara Sultanova, 2015)

Source: Sultanova, D. (Trans.). In H. Musoeva (Ed.), Selected Gazals of Navoiy. Tashkent: Navruz Publishing House, 2015

Come, my dark eyed beauty that dwelling thy endeared land
make,

Dwell in the pupil of my eye black, of it your Homeland make.

Blooms of heart in your flower like face driving flowery dale
form,

With blossoms of soul enriching your grace, bonnie orchard
make.

And with the blood bleeding from mine heart, color thy feet

and toes,

Flirting by side of me, your dog, his web of life lengthened
make.

O Earth, if my dust were found in the mountains of separation,
Knead dough and of it below that mountain notable mound
make.

If you take care of showing thy grandeur to your true lovers,
Let your hair down and around your slender waist it curled
make.

O gardener, you can't rescue the garden from downward fall,
Tho' thorns made of needles cover its roof, of them thou grate
make.

And whether I die on beholding sweat on her brow, o friend,
Wash my body with waters of flowers, of petals shroud make.

Novoiy if you want to hold the feast which would take one's
breath,
To brighten that party of yours from sheaf of wheat a candle
make.

Google translation

My dark-eyed one, come, now make humanity a study,
Make a home like that of humans in the sight of my eyes.

Create a garden of joy on the rose of your face,
Make the sapling of your stature a meadow of the rose of life.

Bind the henna from your heart's blood to your belt,
Make the thread of life for your dog in sorrow.

Oh wheel, if my soil is found on the mountain of separation,
Make it dough and bake it again on that mountain.

If you wish for your face to reach union, oh hearts,
Completely comb your hair from head to toe.

Oh gardener, the autumn army does not object,
On this garden wall, make thyme from thorn.

Seeing sweat on your face, if I die, oh companion,
Wash me with rose water and make a shroud from rose petals.

Navoi, if you mix the joy in life with souls,
Make the candle of gathering the flame of a crowned
gathering.

DeepL

My dark-eyed one, come and make bravery your pursuit,
In the darkness of my eyes, make valor your homeland.

On the rose of your face, create a garden of the heart,
And of your slender form, make a meadow of the soul's rose
garden.

On your sandal strap bind henna from the blood of my heart,
And to your dog tie the chain of my sorrowful soul.

If on the mountain of parting my dust is found, O wheel,
Mold it again and heap it on that mountain.

If you wish your face to attain the bliss of reunion,
then truly tear your hair from head to foot.

O gardener, do not stand in the way of autumn's army; on the
roof of this garden, if you will, plant thorns as fine as a needle.

When you see sweat on my face, if I die, O beloved, wash me
with rosewater and shroud me in rose petals.

Nawā'ī, if you hold a gathering of the soul's passion, make its
spear the candle of the gathering.

ChatGPT

Dark-eyed beauty, come, abandon pride and cruelty now;
Make your dwelling in the darkness of my eyes like their very soul.

Turn the garden of my heart into a blooming paradise for your
rose-like face; Make the meadow of my soul flourish for the sapling of
your graceful stature.

Tie henna upon your swift steed with the blood of my
wounded heart;
Make a rope for your dog from the thread of my sorrowful soul.

If, upon the mountain of separation, my dust should ever be
found, O heavens, Knead it into clay and make from it another Farhod,
the mountain-carver.

If you wish hearts to attain the union of your radiant face, Curl
your tresses from head to toe with twists and ringlets.

O gardener, no barrier can stop the army of autumn; Even if
you make thorns from needles upon the walls of this garden.

Should I die upon seeing the sweat upon your face, O friend,
Wash me with rosewater and shroud me in rose petals.

Navoi, if you would gather an assembly within the passion of
the soul, Make the flame-like tip of his arrow the candle of that
gathering.