

# AI-BASED TRANSLATION MODELS AND LINGUOCULTURAL FEATURE INTEGRATION IN CHINESE-UZBEK PILGRIMAGE TOURISM TERMINOLOGY

<https://doi.org/10.70728/phil.v05.i05.024>

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**Abstract:** Artificial intelligence-based translation systems have emerged as a significant research object in contemporary linguistics and translation studies. The translation of pilgrimage tourism terminology between Chinese and Uzbek presents a particularly compelling case for investigation, given that religious and cultural terms in this domain carry distinctive linguocultural properties that conventional machine translation systems frequently fail to render adequately. Chen and Lin (2025) conducted a multidimensional comparative study evaluating the performance of ChatGPT, Google Translate, and DeepL in translating Chinese tourism texts into English. Drawing on their findings, it becomes possible to assess the capabilities and limitations of AI-based translation models when applied to specialized domains - most notably, pilgrimage tourism terminology, where cultural and religious specificity is paramount.

**Keywords:** Artificial Intelligence (AI), Neural Machine Translation (NMT), Large Language Models (LLMs), ChatGPT, pilgrimage tourism terminology, Chinese-Uzbek translation, linguocultural features, cultural sensitivity, prompt engineering, tourism translation, AI-based translation models, religious tourism discourse

## FOR THE THEORETICAL FRAMEWORK CHAPTER

### 1.1 AI-Based Translation Models and Theoretical Foundations

In recent years, artificial intelligence has significantly transformed the field of translation studies. Among the most influential developments are Neural Machine Translation (NMT) systems and Large Language Models (LLMs), which have shown notable advantages over earlier rule-based and statistical machine translation approaches. Traditional rule-based systems relied heavily on manually created grammatical rules and bilingual dictionaries, while statistical machine translation primarily depended on probability calculations derived from parallel corpora. Although these earlier methods contributed to the evolution of automated translation,

they often struggled with contextual meaning, idiomatic expressions, and culturally specific terminology.

By contrast, NMT models utilize deep learning techniques and artificial neural networks to process entire sentences and broader textual contexts simultaneously. This allows the system to produce translations that are more natural, coherent, and semantically accurate. Furthermore, modern LLMs such as OpenAI's GPT-based models and Google's translation systems are capable of understanding contextual nuances, stylistic variations, and pragmatic meanings more effectively than previous technologies. These capabilities are particularly valuable in the translation of specialized texts, including tourism discourse, religious terminology, and culturally embedded expressions.

According to Chen and Lin (2025), the quality of AI-generated translation can be evaluated through four essential dimensions: fidelity, fluency, cultural sensitivity, and persuasiveness. Fidelity refers to the degree to which the translated text accurately conveys the original meaning and information. Fluency concerns the grammatical correctness and natural readability of the target language output. Cultural sensitivity emphasizes the translator's ability to preserve cultural references, traditions, and social meanings embedded in the source text. Persuasiveness, especially important in tourism discourse, relates to the extent to which the translation can attract, influence, and emotionally engage readers.

These evaluative criteria are highly relevant for the translation of pilgrimage tourism terminology from Chinese into Uzbek. Pilgrimage tourism texts frequently contain religious concepts, historical references, and culturally symbolic expressions that require more than literal translation. For instance, the Chinese term “朝圣” (cháoshèng) literally means “pilgrimage,” but its interpretation may vary depending on religious and cultural context. Similarly, expressions such as “佛教圣地” (Buddhist sacred site) or “香火文化” (incense-offering culture) involve spiritual and cultural connotations that may not have direct lexical equivalents in Uzbek. In such cases, AI translation models must not only transfer semantic meaning but also preserve the emotional and cultural significance of the original text.

Moreover, the Chinese-Uzbek language pair remains considerably under-resourced in current translation studies and computational linguistics research. Compared with widely studied language pairs such as Chinese-English or English-Russian, there is a limited availability of bilingual corpora, terminology databases, and linguistic resources for Chinese and Uzbek. This shortage creates challenges for AI-based systems, particularly in handling culturally specific tourism vocabulary, religious expressions, and idiomatic language. Nevertheless, recent advancements in multilingual LLMs have improved translation quality even for low-resource

languages by leveraging cross-linguistic learning and large-scale multilingual datasets.

For example, an AI system translating the Chinese phrase “丝绸之路文化遗产” may produce the Uzbek equivalent “Ipak yo‘li madaniy merosi,” which successfully preserves both historical and cultural meaning. However, more complex expressions connected with religious pilgrimage or local customs may still require human revision to ensure contextual accuracy and cultural appropriateness. Therefore, despite the rapid progress of AI translation technologies, human expertise continues to play an important role in evaluating and refining machine-generated translations, especially within culturally sensitive domains such as pilgrimage tourism.

## 1.2 Prompt Engineering and Translation Quality

A significant methodological contribution of Chen and Lin (2025) is reflected in their comparative analysis of two different prompt-engineering approaches. The first approach employed a brief and general translation instruction, whereas the second utilized domain-specific guidance that explicitly encouraged the model to apply cultural adaptation and persuasive translation strategies. The findings of their study indicated that culturally focused prompts led to statistically significant enhancements across all four evaluative dimensions. This outcome has direct relevance to the present dissertation, as the development of customized prompts for AI-based systems such as OpenAI’s ChatGPT may function as an effective methodological instrument for strengthening the incorporation of linguocultural elements in the translation of Chinese pilgrimage tourism terminology into Uzbek. Furthermore, the growing significance of prompt design reflects a broader shift in translation theory, where the interaction between human guidance and artificial intelligence increasingly influences translation outcomes. In this regard, prompt engineering serves as a bridge between computational technologies and human-centered translation practices, enabling researchers and translators to shape AI-generated outputs according to specific linguistic, cultural, and communicative objectives.

## FOR THE LITERATURE REVIEW SECTION

### 2.1 Machine Translation in Specialized Domains

Previous studies have demonstrated that machine translation systems experience considerable challenges when translating texts that contain not only informational content but also culturally embedded references, idiomatic expressions, and persuasive language, all of which are characteristic features of pilgrimage tourism discourse. Chen and Lin (2025) noted that conventional Neural Machine Translation (NMT) systems, including Google Translate and DeepL, generally emphasize grammatical precision and syntactic accuracy while giving comparatively less attention to rhetorical adaptation and cultural suitability. Their quantitative analysis identified a significant disparity in translation performance, with ChatGPT obtaining

an average fidelity score of 4.04, whereas DeepL and Google Translate achieved scores of 2.34 and 1.93 respectively on a five-point evaluation scale. These findings highlight the constraints of traditional encoder-decoder architectures in handling culturally sensitive and context-dependent source texts, a challenge that is especially significant for the Chinese-Uzbek language pair within the context of pilgrimage tourism translation.

## 2.2 Cultural Sensitivity in AI-Based Translation

The incorporation of linguocultural elements into AI-based translation systems has become one of the most significant issues in modern translation technology research. Chen and Lin (2025) demonstrated that ChatGPT, when operating through culturally customized prompts, obtained an average cultural sensitivity score of 4.09, considerably surpassing the performance of DeepL (2.07) and Google Translate (1.84). According to the researchers, this higher level of performance can be explained by ChatGPT's ability to draw upon extensive multilingual and multicultural training data, allowing the model to interpret culturally embedded expressions and reproduce them in forms that are contextually and culturally appropriate for the target audience.

This capability is particularly important in the translation of Chinese pilgrimage tourism terminology into Uzbek, where many expressions contain religious, historical, and symbolic meanings that cannot be adequately conveyed through literal translation. Terms associated with sacred places, spiritual practices, and traditional beliefs often carry implicit cultural connotations that require contextual interpretation rather than direct lexical equivalence. For example, the Chinese expression “圣地” may literally be translated as “holy place,” yet in pilgrimage tourism discourse it may more appropriately correspond to the Uzbek expression “muqaddas ziyorat maskani,” which preserves both the religious and cultural significance of the term. Similarly, the phrase “佛教文化遗产” involves not only the meaning of “Buddhist cultural heritage” but also broader associations with spiritual tradition, historical identity, and religious values.

Another example can be observed in the translation of the term “香火,” which literally refers to incense burning in Chinese religious practice. A direct lexical translation may fail to communicate its deeper spiritual implications connected with worship, devotion, and temple culture. In such cases, AI systems capable of culturally adaptive translation are more likely to generate contextually meaningful equivalents that are understandable and culturally acceptable for Uzbek readers. Therefore, cultural sensitivity represents a crucial factor in evaluating the effectiveness of AI-assisted translation models, especially within linguistically and culturally complex domains such as pilgrimage tourism.

## 2.3 Research Gap and Justification for the Present Study

Although the existing body of scholarship on AI-assisted translation within tourism discourse has expanded considerably in recent years, the majority of studies have focused primarily on high-resource European language pairs or on Chinese-English translation. In contrast, the Chinese-Uzbek language pair, particularly within the specialized field of pilgrimage tourism, has received almost no empirical investigation. Moreover, previous research has not sufficiently examined how linguocultural elements may be systematically incorporated into AI-based translation systems when translating terminology related to religious and pilgrimage tourism.

Chen and Lin (2025) also recognize this limitation and emphasize the necessity for future studies to conduct domain-specific and language-pair-oriented evaluations involving non-European languages. Their observation highlights the broader imbalance within contemporary AI translation research, where low-resource languages continue to remain underrepresented despite their growing importance in intercultural communication and tourism development.

The present dissertation seeks to address this research gap by developing an AI-based translation model specifically designed for the translation of Chinese-Uzbek pilgrimage tourism terminology. In addition, the study positions the integration of linguocultural features as a fundamental methodological component of the proposed translation framework. Through this approach, the research aims to contribute both to the advancement of AI-assisted translation studies and to the improvement of culturally sensitive translation practices for under-resourced language pairs.

## FOR THE METHODOLOGY CHAPTER

### 3.1 Evaluative Framework

Following the methodological framework proposed by Chen and Lin (2025), the present research employs a mixed-methods design that integrates quantitative expert evaluation with qualitative linguistic analysis. The study utilizes four principal evaluative dimensions - fidelity, fluency, cultural sensitivity, and persuasiveness - as the central assessment criteria. These dimensions are especially appropriate for the analysis of pilgrimage tourism terminology translation because they encompass both the semantic accuracy required for translating religious and culturally significant terms and the adaptive linguistic qualities necessary to facilitate effective intercultural communication between Chinese- and Uzbek-speaking audiences.

### 3.2 AI Model Selection and Prompt Design

In accordance with the findings reported by Chen and Lin (2025), the present study utilizes ChatGPT as the principal AI-based translation model for analysis due to its demonstrated effectiveness in culturally sensitive and domain-specific translation tasks. The research applies two distinct prompt conditions: a baseline prompt containing a general translation instruction and a culturally oriented prompt

specifically developed to direct the model toward the incorporation of linguocultural features associated with Chinese and Uzbek pilgrimage tourism discourse.

This prompt-engineering strategy functions as the primary operational mechanism through which linguocultural integration is facilitated within the AI translation process. By providing context-specific guidance related to religious terminology, cultural symbolism, and persuasive tourism language, the prompts aim to enhance the contextual appropriateness and cultural adaptability of the translated output. Through this approach, the study seeks to evaluate the extent to which tailored prompts can improve the quality and cultural accuracy of AI-generated translations in the Chinese-Uzbek pilgrimage tourism domain.

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