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AI REVOLUTION IN LITERARY TRANSLATION: A BIBLIOMETRIC ANALYSIS OF TRENDS, CHALLENGES, AND POTENTIALS

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Abstract:

AI has significantly affected literary translation through tools such as Neural Machine Translation and Large Language Models, providing greater speed and accessibility. However, their grasp of literary subtleties, like metaphor, tone, and culture, remains subject to debate. This study uses a bibliometric analysis of 254 peer-reviewed articles from 2005 to 2025 in the Scopus database, employing OpenRefine, VOSviewer, and Scopus Analyser. Findings indicate a surge in publications after 2020, reaching a peak in 2024. Most research comes from technical disciplines; Computer Science (26.6%), Engineering (21.7%), and Mathematics (10.3%), with limited input from the Arts and Humanities (1.8%). China leads in publications (41.3%), followed by India and the U.S. Keyword analysis reveals a focus on AI methods, often neglecting translation-specific challenges. The study calls for interdisciplinary collaboration and culturally sensitive AI to preserve literary depth.

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Keywords:

Neural Machine; Literary Translation; Computational Linguistics; Translation Technology

Introduction

The rise of artificial intelligence (AI) has significantly changed many fields, including literary translation. This change is driven by the integration of advanced AI tools, such as neural machine translation (NMT) and large language models (LLMs), which have improved the efficiency and precision of translations. However, using AI in literary translation poses unique challenges due to the complex nature of literary texts, which require a high level of linguistic skill, cultural understanding, and creativity (Belhassen, Hakami, Alzobidy, & Hamda, 2025; Bizjak, 2024; Yang, 2022). This paper looks at the AI revolution in literary translation, exploring both the opportunities and limitations these technologies bring.

Literature Review

AI technologies have created numerous opportunities in the field of literary translation. The integration of AI with traditional translation approaches has enriched research content and broadened the scope of translation studies (Yang, 2022). AI-driven corpus text analysis and text mining techniques have been developed for literary translation training, enabling students to construct parallel corpora and carry out comparative analyses of linguistic and stylistic features (Wu, Feng, & Mau, 2025). Furthermore, AI tools like ChatGPT have demonstrated potential in generating initial drafts and conducting terminology research, supporting human translators in their work (Abdelhalim, Alsahil, & Alsuhaibani, 2025; Belhassen et al., 2025). These advancements have made the translation process more efficient and accessible.

Despite the advancements, AI faces significant challenges in literary translation. One major limitation is the difficulty in capturing literary nuances such as metaphors, tone, cultural context, and stylistic features (Belhassen et al., 2025; Bizjak, 2024). Studies have shown that while AI can produce translations with high accuracy, it often struggles with the emotional richness and cultural subtleties inherent in literary texts (Abdelhalim et al., 2025; Belhassen et al., 2025). Furthermore, the quality of AI-generated translations can vary, and there is a need for human post-editing to ensure the translations meet the required standards (Belhassen et al., 2025; Ozyumenko & Larina, 2025). These challenges emphasise the essential role of human creativity and intuition in literary translation.

The collaboration between AI and human translators is regarded as a promising way to address the limitations of AI in literary translation. AI can act as a supplementary tool, helping human translators by offering initial drafts and conducting early analyses (Belhassen et al., 2025; Van Egdom, Kosters, & Declercq, 2024). This collaboration enables human translators to concentrate on fine-tuning the translations, ensuring the cultural and emotional subtleties are properly conveyed (Belhassen et al., 2025; Naeem, ur Rehman, & Rasheed, 2025). The incorporation of AI into translation workflows has also spurred the creation of new professional roles and educational requirements, highlighting the need to train future translators to work effectively with AI tools (Horbacauskiene & Ratkeviciene, 2025; Mejías-Climent & de Los Reyes Lozano, 2023).

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The future of AI in literary translation depends on the continuous enhancement of AI technologies and the development of culturally aware models. Research indicates that AI tools need to prioritise transparency, fairness, and cultural sensitivity to support literary translation effectively (Naeem et al., 2025; Ssemugabi, 2025). Furthermore, there is a need for additional research to explore AI's potential in improving the quality of literary translations through prompt-driven post-editing and other innovative methods (Elkins, 2024; Van Egdom et al., 2024). By addressing these challenges and harnessing the strengths of both AI and human translators, the field of literary translation can reach new levels of efficiency and accuracy.

In conclusion, although AI has transformed literary translation through new tools and methods, human expertise remains vital for maintaining quality and cultural authenticity. The partnership between AI and human translators provides a balanced approach, combining the strengths of both to address the inherent challenges of literary translation.

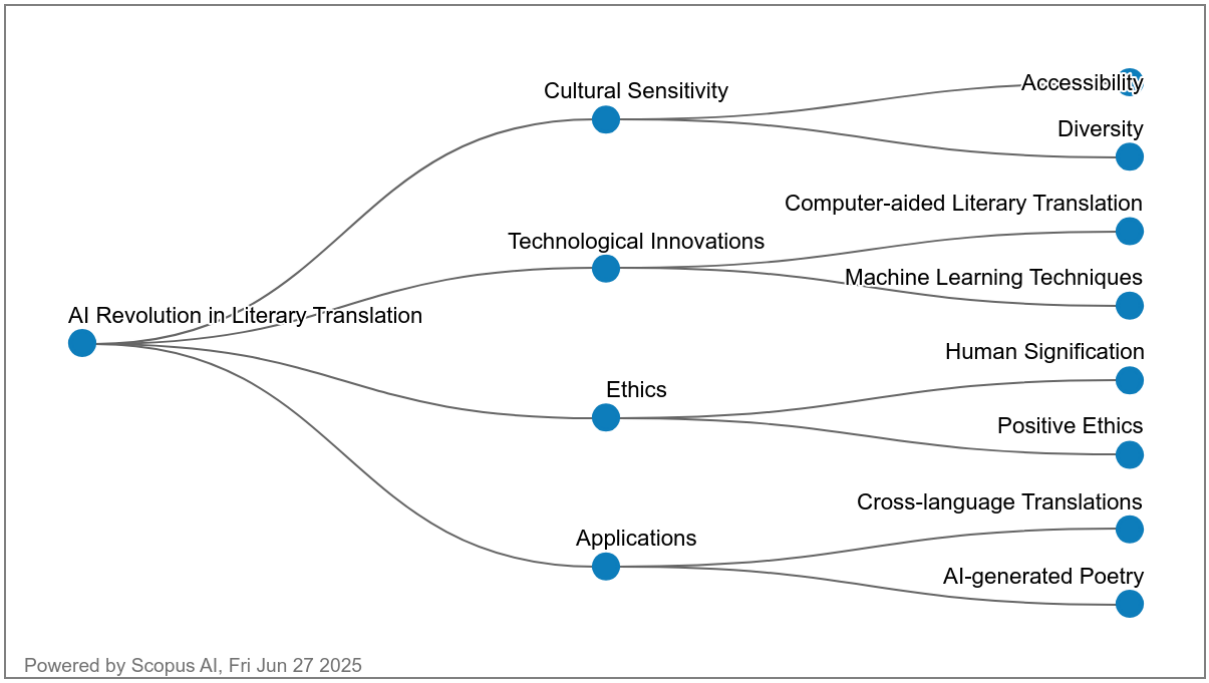

Figure 1: Overview of Literature

Research Question

1. What is the annual publication trend in the field of AI-driven literary translation from 2005 to 2025?
2. Which subject areas have contributed the most to research on AI in literary translation, and how influential are these publications?
3. What are the top 10 most cited articles related to AI applications in literary translation?
4. Which countries are leading in terms of publication output on AI in literary translation?
5. What are the most frequently used keywords in the literature on AI and literary translation?

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Methodology

Bibliometrics involves the systematic collection, organisation, and analysis of bibliographic data sourced from scientific publications (Alves I. B.; De Nadae J., 2021; Assyakur E. M., 2022; Verbeek K.; Luwel M.; Zimmermann E., 2002). Beyond basic descriptive statistics, such as identifying core journals, publication years, and prolific authors (Wu T., 2017), bibliometric analysis also employs advanced methods, including document co-citation analysis. A thorough literature review requires a careful and iterative process that includes selecting suitable keywords, conducting comprehensive searches, and performing detailed analytical evaluations. This methodological rigour helps assemble an inclusive bibliography and ensures the reliability of results (Fahimnia J.; Davarzani H., 2015). Consistent with this approach, the current study concentrated on high-impact publications, as they provide valuable insights into the theoretical foundations guiding the research field. To ensure data accuracy, SCOPUS was used as the primary source for data retrieval (Al-Khoury, 2022; di Stefano M.; Veronay G., 2010; Khiste R. R., 2017). Additionally, to maintain academic standards, only peer-reviewed journal articles were included, while books and lecture notes were deliberately excluded from the dataset (Gu T.; Wang X.; Yang X.; Yu Z., 2019). The bibliographic data were extracted from Elsevier's SCOPUS database, known for its extensive and multidisciplinary coverage, spanning publications from 2020 to December 2023 for further analysis.

Data Search Strategy

To ensure the robustness and accuracy of data collection, this study used a systematic screening protocol to identify and retrieve relevant literature. The initial search was performed on the **Scopus** database using the following search expression within the **title field**:

TITLE ((“Artificial Intelligence" OR AI OR "deep learning" OR "machine learning" OR "neural network") AND (Literature OR literary OR poetry OR novel OR prose OR discourse OR fiction* OR narrative* OR poem) AND (Translation* OR transcript* OR adapt* OR Translate))*

This initial search yielded **401 records**. A screening process was then applied to refine the dataset according to specific inclusion and exclusion criteria. Only **peer-reviewed journal articles written in English** were retained, while publications such as **books, conference proceedings, and review articles** were excluded. After filtering, a total of **254 articles** were selected for bibliometric analysis.

The publication time frame was limited to the years **2005 to 2025**, a range chosen to observe the development of artificial intelligence applications in literary translation over the past two decades. All relevant records indexed in Scopus **up to the time of data collection** were considered for inclusion in the analysis.

Table 1: The Search String.

Scopus	TITLE (("Artificial Intelligence" OR AI OR "deep learning" OR "machine learning" OR "neural network*") AND (Literature OR literary OR poetry OR novel OR prose OR discourse OR fiction* OR narrative* OR poem) AND (Translation* OR transcript* OR adapt* OR Translate)) AND PUBYEAR > 2004 AND PUBYEAR < 2026 AND (LIMIT-TO (SRCTYPE , "j")) AND (LIMIT-TO (DOCTYPE , "ar")) AND (LIMIT-TO (LANGUAGE , "English"))

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Table 2: The Selection Criterion in Searching

Criterion	Inclusion	Exclusion
Language	English	Non-English
Timeline	2021 – 2023	< 2021
Literature type	Journal (Article)	Conference, Book, Review

Data Analysis

The bibliometric analysis in this study was carried out using VOSviewer, a widely recognised software tool developed by Nees Jan van Eck and Ludo Waltman of Leiden University, Netherlands (van Eck L., 2010, 2017). Known for its versatility and user-friendly interface, VOSviewer is effective at constructing and visualising bibliometric networks, such as co-authorship, co-citation, keyword co-occurrence, and citation mapping. Its strength lies in transforming large and complex bibliographic datasets into clear, interactive visualisations, aiding the detection of patterns, relationships, and research trends within a specific scholarly field.

Unlike traditional Multidimensional Scaling (MDS) techniques, VOSviewer employs a proprietary layout algorithm that positions items in a low-dimensional space based on their similarity scores, allowing for a more accurate and interpretable visual representation of bibliometric data (Appio F.; Di Minin A., 2014; van Eck L., 2010). A notable feature of the software is its use of the association strength (AS_{ij}) as a normalisation method to determine the proximity between two items in a network. The association strength is calculated using the following formula (van Eck L., 2007):

$$AS_{ij} = \frac{C_{ij}}{w_i w_j}$$

Where:

- C_{ij} represents the number of co-occurrences of items *i* and *j*
- W_i and W_j denote the total occurrences of items *i* and *j*, respectively

This metric indicates how often two items appear together compared to what would be expected if they were independent. The visualisation that results offers insights into the semantic and structural closeness of concepts or entities within the research corpus.

For this study, bibliometric data were collected from the Scopus database, covering publications from 2005 to 2025. The dataset included metadata such as titles, author names, source journals, publication years, keywords, and citation counts. These data were exported in PlainText format, compatible with VOSviewer version 1.6.19. Using this version, network visualisations were created for the following analytical dimensions.

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- Keyword co-occurrence (to detect thematic focus and emerging research areas)
- Co-authorship analysis (to examine collaboration patterns)
- Citation analysis (to identify highly influential works)

Each map created by VOSviewer features clustering, colour-coded thematic groups, and density overlays, which together enable a detailed exploration of trends, challenges, and changing patterns in the field of AI-driven literary translation research.

Findings

What Is The Annual Publication Trend In The Field Of AI-Driven Literary Translation From 2005 To 2025?

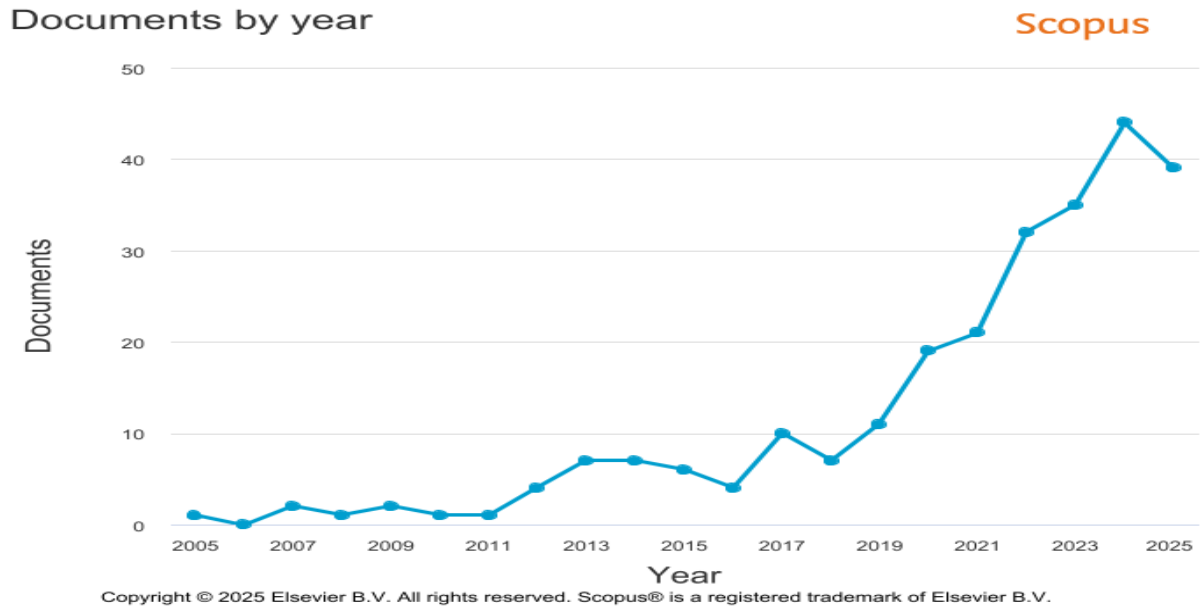

Figure 2: Annual Distribution of Publications Related to The AI Revolution in Literary Translation (2005–2025)

Source: Adapted from Scopus Database, accessed on 27 June 2025 (https://www.scopus.com)

Table 3: Annual Distribution of Publications Related to The AI Revolution in Literary Translation (2005–2025)

YEAR	NO. OF ARTICLE	PERCENTAGE	YEAR	NO. OF ARTICLE	PERCENTAGE
2025	39	15.4%	2015	6	2.4%
2024	44	17.3%	2014	7	2.8%
2023	35	13.8%	2013	7	2.8%
2022	32	12.6%	2012	4	1.6%
2021	21	8.3%	2011	1	0.4%
2020	19	7.5%	2010	1	0.4%
2019	11	4.3%	2009	2	0.8%
2018	7	2.8%	2008	1	0.4%

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2017	10	3.9%	2007	2	0.8%
2016	4	1.6%	2005	1	0.4%

Source: Data retrieved from Scopus Database (https://www.scopus.com), accessed on 27 June 2025

The distribution of articles over the years shows a clear upward trend in scholarly interest in the intersection of artificial intelligence and literary translation. Starting with minimal contributions between 2005 and 2015—each year accounting for less than 3%—the field experienced slow but steady growth. Remarkably, the number of publications began to rise significantly from 2019 onwards, with a sharp increase starting in 2021. This surge probably reflects the broader global expansion of AI applications in the humanities and the increasing academic recognition of AI's potential in literary and translation studies.

From 2022 to 2025, there is a noticeable concentration of research output, with these four years alone accounting for nearly **60% of the total publications** (150 articles). The peak occurred in 2024 with **44 articles (17.3%)**, followed closely by 2025 with **39 articles (15.4%)**. This ongoing increase highlights not only the relevance of the topic but also the research community's growing dedication to exploring how AI technologies are transforming literary translation. The pattern indicates that AI-driven literary translation has shifted from a niche interest into a rapidly expanding interdisciplinary research field, signalling strong potential for future exploration and innovation.

Which Subject Areas Have Contributed The Most To Research On AI In Literary Translation, And How Influential Are These Publications?

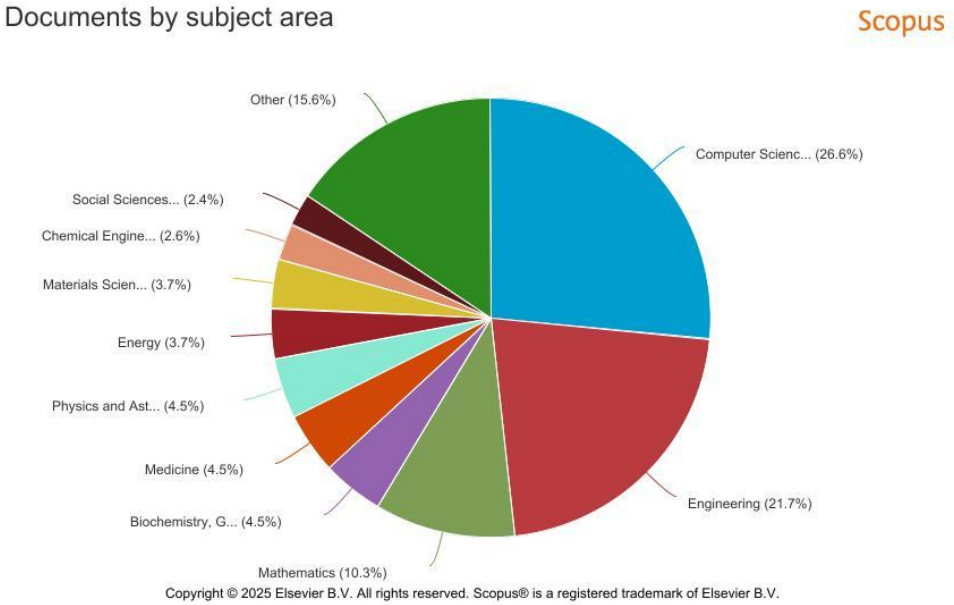

Figure 3: Subject Area Distribution of Publications on The AI Revolution in Literary Translation

Source: Adapted from Scopus Database, accessed on 27 June 2025 (https://www.scopus.com)

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Table 4: Subject Area Distribution of Publications on The AI Revolution in Literary Translation

SUBJECT AREA	NO. OF ARTICLE	PERCENTAGE
Computer Science	131	26.6%
Engineering	107	21.7%
Mathematics	51	10.3%
Biochemistry, Genetics and Molecular Biology	22	4.5%
Medicine	22	4.5%
Physics and Astronomy	22	4.5%
Energy	18	3.7%
Materials Science	18	3.7%
Chemical Engineering	13	2.6%
Social Sciences	12	2.4%
Environmental Science	11	2.2%
Neuroscience	11	2.2%
Chemistry	10	2.0%
Multidisciplinary	10	2.0%
Arts and Humanities	9	1.8%
Decision Sciences	7	1.4%
Earth and Planetary Sciences	5	1.0%
Agricultural and Biological Sciences	4	0.8%
Health Professions	3	0.6%
Economics, Econometrics and Finance	2	0.4%
Business, Management and Accounting	1	0.2%
Immunology and Microbiology	1	0.2%
Nursing	1	0.2%
Pharmacology, Toxicology and Pharmaceutics	1	0.2%
Psychology	1	0.2%

Source: Data retrieved from Scopus Database (https://www.scopus.com), accessed on 27 June 2025

The analysis of the subject area reveals a strong focus on the AI revolution in literary translation within technical and computational disciplines. **Computer Science** dominates, representing **26.6%** of the total publications, followed by **Engineering** (**21.7%**) and **Mathematics** (**10.3%**). These figures highlight the vital role of algorithm development, machine learning models, and computational frameworks in advancing AI applications in literary translation. The presence of **Physics**, **Biochemistry**, and **Medicine**—each accounting for 4.5%—indicates interdisciplinary overlaps where AI methods developed initially for scientific analysis are being adapted for linguistic and textual domains.

Interestingly, traditionally humanities-focused fields, such as **Arts and Humanities** and **Social Sciences,** account for only a small share of the output, at **1.8%** and **2.4%**, respectively. This indicates that although the subject—literary translation—belongs to the humanities, the methodological foundation of the research is mainly technological. The minimal representation

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of disciplines like **Business**, **Nursing**, and **Psychology** (each below 1%) further emphasises the niche and emerging nature of this interdisciplinary area. Overall, the data reflect a developing scholarly landscape where AI-driven literary translation is shaped more by computational innovation than by traditional literary theory.

What Are The Top 10 Most Cited Articles Related To AI Applications In Literary Translation?

Authors	Title	Year	Source title	Cited by
(Kabudi, Pappas, & Olsen, 2021)	AI-enabled adaptive learning systems: A systematic mapping of the literature	2021	Computers and Education: Artificial Intelligence	352
(Xu, Liu, Yan, & Yan, 2018)	A Novel Adaptive Neural Network Constrained Control for a Multi-Area Interconnected Power System with Hybrid Energy Storage	2018	IEEE Transactions on Industrial Electronics	190
(Kan et al., 2021)	A novel IoT network intrusion detection approach based on Adaptive Particle Swarm Optimization Convolutional Neural Network	2021	Information Sciences	167
(Tang, Zhu, & Yuan, 2022)	A novel adaptive convolutional neural network for fault diagnosis of hydraulic piston pump with acoustic images	2022	Advanced Engineering Informatics	131
(Niu et al., 2019)	A novel neural-network-based adaptive control scheme for output-constrained stochastic switched nonlinear systems	2019	IEEE Transactions on Systems, Man, and Cybernetics: Systems	128

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(Wang, Wu, & Guo, 2014)	Novel adaptive strategies for synchronization of linearly coupled neural networks with reaction-diffusion terms	2014	IEEE Transactions on Neural Networks and Learning Systems	125
(Taghavifar & Rakheja, 2019)	Path-tracking of autonomous vehicles using a novel adaptive robust exponential-like-sliding-mode fuzzy type-2 neural network controller	2019	Mechanical Systems and Signal Processing	121
(Jaramillo-Lopez, Kenne, & Lamnabhi-Lagarrigue, 2016)	A novel online training neural network-based algorithm for wind speed estimation and adaptive control of PMSG wind turbine system for maximum power extraction	2016	Renewable Energy	114
(Cao & Hovakimyan, 2007)	Novel L1 neural network adaptive control architecture with guaranteed transient performance	2007	IEEE Transactions on Neural Networks	84
(Essa, Celik, & Human-Hendricks, 2023)	Personalized Adaptive Learning Technologies Based on Machine Learning Techniques to Identify Learning Styles: A Systematic Literature Review	2023	IEEE Access	83

Source: Data retrieved from Scopus Database (https://www.scopus.com), accessed on 27 June 2025

The most cited articles in this bibliometric dataset highlight a strong focus on **adaptive neural networks**, **machine learning**, and **AI-based control systems**, reflecting the fundamental computational methods shaping AI-driven translation research. The leading contribution is from Kabudi et al. (2021), titled *"AI-enabled adaptive learning systems: A systematic mapping of the literature*," with **352 citations**, indicating significant academic influence and relevance. Other highly cited works, such as Xu et al. (2018), with **190 citations,** and Kan et al. (2021),

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with **167 citations**, concentrate on AI applications in power systems and network intrusion detection, respectively. This demonstrates how progress in adaptive intelligence has wide-ranging interdisciplinary effects, including on language-related technologies.

Although the paper's central focus is on literary translation, the citation patterns reveal that the **technological infrastructure of adaptive AI research**—stemming from engineering, education, and computer science—serves as the foundation for future developments in the field. Interestingly, recent works, such as those by Tang et al. (2022) and Essa et al. (2023), although newer, are already gaining popularity, indicating a rising scholarly interest in the human-centred applications of AI. The trend shows that, while literary translation as a field is still growing in terms of citation influence, it rests on a strong and well-cited methodological basis shaped by broader AI research.

Which Countries Are Leading In Terms Of Publication Output On AI In Literary Translation?

Figure 4: The Top 10 Countries Based on The Number of Publications

Source: Constructed By Using MapChart.Net based on Data from Scopus Database (https://www.scopus.com), Accessed on 27 June 2025

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Table 5: The Top 10 Countries Based on The Number of Publications

COUNTRY/TERRITORY	NO. OF ARTICLE	PERCENTAGE
China	105	41.3%
India	39	15.4%
United States	27	10.6%
Saudi Arabia	14	5.5%
Iran	12	4.7%
United Kingdom	11	4.3%
Australia	9	3.5%
South Korea	9	3.5%
Canada	8	3.1%
Taiwan	8	3.1%

Source: Data retrieved from Scopus Database (https://www.scopus.com), accessed on 27 June 2025.

The geographical distribution of publications indicates that China leads in scholarly output in AI and literary translation, with 105 articles, representing a significant 41.3% of the total. This dominant position reflects China's growing investment in AI research and its expanding global influence in computational linguistics and language technology. India comes second with 39 articles (15.4%), highlighting Asia's key role in advancing research at the intersection of artificial intelligence and language studies. The United States, which has historically been a leader in technological innovation, ranks third with 27 articles (10.6%), showing consistent involvement, although slightly overshadowed by emerging Asian contributors.

Other notable contributors include **Saudi Arabia (5.5%)**, **Iran (4.7%)**, and **the United Kingdom (4.3%)**, highlighting regional diversification in AI-related literary research. Countries such as **Australia**, **South Korea**, **Canada**, and **Taiwan**, each contributing around **3–3.5%**, further illustrate a global engagement with the topic, albeit on a smaller scale. The distribution emphasises that while AI and translation research are internationally collaborative, they are predominantly led by technologically progressive nations with strong governmental or institutional support for AI initiatives. This presents opportunities for broader international partnerships and knowledge exchange, especially as the field of AI-driven literary translation continues to develop and become more global.

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What Are The Most Frequently Used Keywords In The Literature On AI And Literary Translation?

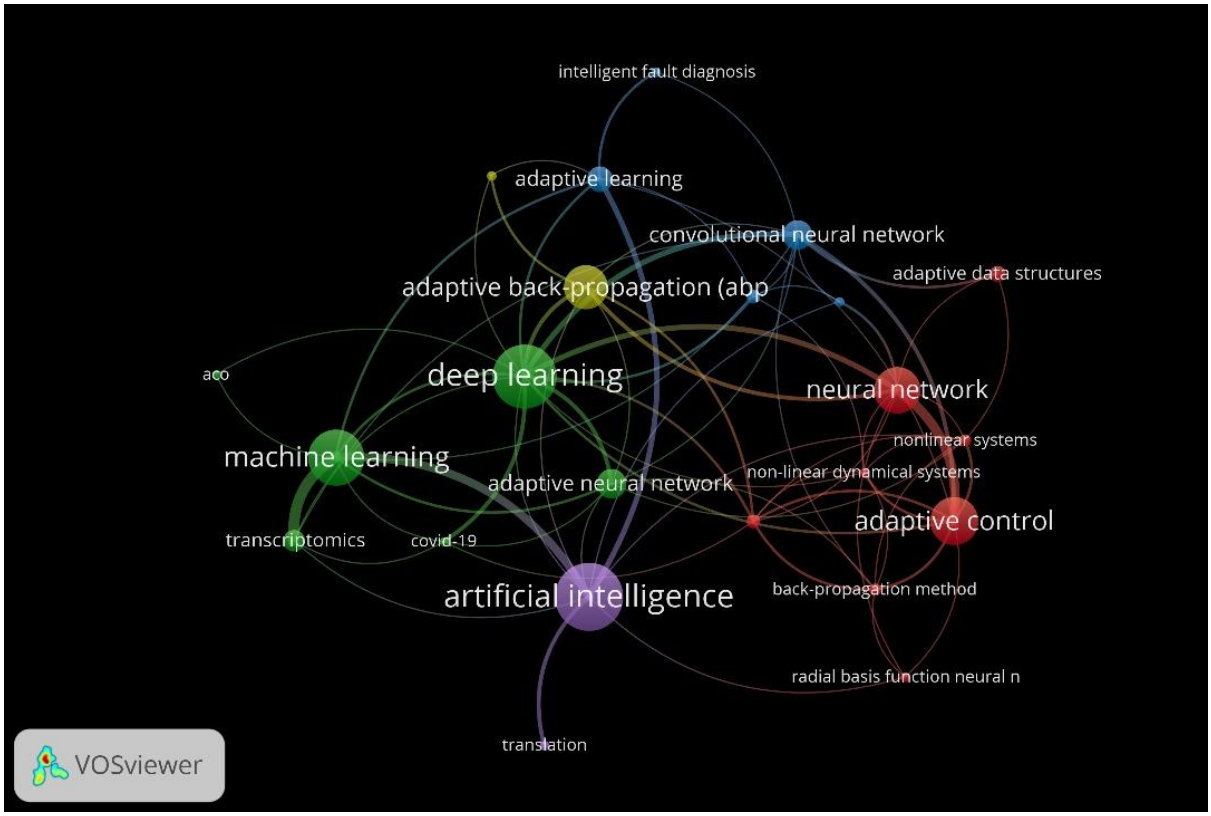

Figure 5: Most Frequently Used Keywords Related To The Literature On AI and Literary Translation

Source: Author's Analysis using VOSviewer based on data retrieved from Scopus Database (https://www.scopus.com), accessed on 27 June 2025

The co-occurrence analysis of author keywords using VOSviewer highlights significant trends in the thematic structure of research on the **AI revolution in literary translation**. The keyword **"artificial intelligence"** stands out notably with **34 occurrences**, emphasising its central role in scholarly discussions. Closely behind is **"deep learning"** with **32 occurrences and the highest total link strength (32)**, underscoring its significance as a technological foundation in recent studies. **"Machine learning"** also appears often (**28 occurrences, link strength: 23**), reflecting its widespread application across translation-related tasks such as natural language processing, pattern recognition, and automated text generation.

Further analysis emphasises the vital role of **neural networks**, which appear in various forms: **"adaptive neural network" (15 occurrences)**, **"convolutional neural network" (15 occurrences)**, and **"recurrent neural network" (7 occurrences)**. These models are essential for processing sequential data and are frequently utilised in machine translation systems. The recurrence of keywords like **"adaptive control" (24 occurrences)** and **"adaptive learning" (13 occurrences)** indicates a strong research interest in intelligent systems that can dynamically adjust based on input, reflecting the complexities of literary and linguistic nuances. Notably, although the keyword **"translation"** appears less often (**5 occurrences**), its co-occurrence with highly technical terms suggests it is being studied in combination with sophisticated AI architectures.

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The inclusion of specialised terms such as **"adaptive back-propagation algorithm," "radial basis function neural network (RBFNN),"** and even **"transcriptomics"** indicates a high level of interdisciplinarity within the dataset. These terms demonstrate that the field is not only rooted in computational linguistics and AI but also draws from bioinformatics, engineering, and systems theory. The relatively lower occurrence of the direct term "translation" may reflect a broader trend where **translation is explored more as an applied domain** rather than as a standalone subject. In conclusion, the keyword network highlights that research on AI in literary translation is deeply intertwined with **technological development**, with AI architectures serving as the backbone of methodological approaches in this emerging interdisciplinary field.

Conclusion

This study aimed to explore the bibliometric landscape of scholarly research on integrating artificial intelligence into literary translation. Specifically, it sought to identify key publication trends, dominant subject areas, highly cited works, geographical distribution of research, and commonly used keywords within the literature. Through bibliometric analysis, this paper offers a comprehensive overview of how AI-related technologies are shaping and transforming the field of literary translation.

The analysis revealed a sharp increase in publication output from 2020 onwards, with a peak in 2024, reflecting growing academic interest in this emerging field. Research is mainly rooted in technical disciplines such as computer science, engineering, and mathematics, indicating that literary translation is increasingly approached through computational methods. The most cited publications mainly focus on adaptive neural networks and AI control systems, highlighting their fundamental role in developing intelligent translation models. Geographically, research output is led by China, followed by India and the United States, demonstrating a strong presence from Asian countries in this area. The keyword analysis showed that, while "artificial intelligence", "deep learning", and "machine learning" dominate the thematic focus, terms directly related to "translation" remain less prominent, reflecting a methodological focus over a thematic one.

This study advances the understanding of AI in literary translation by mapping its intellectual framework, identifying knowledge gaps, and providing insights into future directions. It emphasises the interdisciplinary nature of this research, where literary challenges meet algorithmic precision. Practically, the findings underline the importance of collaboration between computational specialists and language professionals to produce culturally nuanced and contextually precise translations. However, the study is limited by its reliance on a single database and the exclusion of non-English sources. Future research could address these limitations by incorporating additional databases, analysing full-text content, and investigating user experience with AI-generated translations. Overall, the bibliometric approach has proven vital in outlining the development of this emerging field, laying a foundation for further exploration and innovation at the intersection of artificial intelligence and literary translation.

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