

AI-Enhanced Legal Translation: A Bibliometric Analysis of Global Research Trends

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DOI: 10.33705/1111-019-001-010

Received: 13/03/2026

Accepted: 03/06/2026

Published: 30/06/2026

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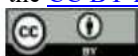
Citation :
AFIA,K. (2026).
AI-Enhanced Legal Translation:
A Bibliometric Analysis of Global
Research Trends
Maalim
I(1), 193-206

Abstract:

This study aims to explore the trajectory of scholarly trends concerning the topic of artificial intelligence in legal translation, in order to facilitate the understanding of future directions in academic interest on this subject. A bibliometric and content analysis was conducted based on the PRISMA framework, supported by the VOSviewer software. The study examined all research published from 1975 to 2025, analyzing a set of 400 publications, as documented in the Scopus database. The findings of this review identify the most significant topics addressed by the journals, as well as the leading countries, academic institutions, journals, and authors.

Keywords: Law; Legal Translation; AI; Language; Artificial Intelligence.

Maalim
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Résumé :

Cette étude vise à explorer la trajectoire des tendances scientifiques concernant le thème de l'intelligence artificielle dans la traduction juridique, afin de faciliter la compréhension des orientations futures de l'intérêt académique pour ce sujet. Une analyse bibliométrique et de contenu a été réalisée sur la base du cadre PRISMA, à l'appui du logiciel VOSviewer. L'étude a examiné toutes les recherches publiées entre 1975 et 2025, analysant un ensemble de 400 publications, telles que documentées dans la base de données Scopus. Les résultats de cette analyse permettent d'identifier les thèmes les plus importants abordés par les revues, ainsi que les principaux pays, institutions universitaires, revues et auteurs.

Mot clés : Droit; Traduction Juridique; IA; Langue; l'Intelligence Artificielle.

الترجمة القانونية المعززة بالذكاء الاصطناعي:**تحليل بيبيوميترى لاتجاهات البحث العالمية****أ. عافية قادة**

جامعة معسكر وحدة البحث: الدولة والمجتمع (جامعة وهران 2)

الملخص:

تهدف هذه الدراسة إلى استكشاف مسار الاتجاهات العلمية المتعلقة بموضوع تطور ترجمة النصوص القانونية في زمن الذكاء الاصطناعي، بغية فهم التوجهات المستقبلية للاهتمام الأكاديمي بهذا الموضوع، وقد تم إجراء تحليل بيبيوميترى وتحليل للمحتوى بالاعتماد على إطار (PRISMA) مدعوماً ببرنامج (VOSviewer). شملت الدراسة جميع الأبحاث المنشورة خلال الفترة الممتدة بين 1975 و 2025، حيث تم تحليل 400 منشور علمي مستخرج من قاعدة البيانات (scopus). وقد حددت نتائج هذه المراجعة أهم الموضوعات التي تناولتها المجالات العلمية، إضافة إلى الدول الرائدة والمؤسسات الأكاديمية والمجلات والباحثين الأكثر إسهاماً.

الكلمات المفتاحية: القانون؛ الترجمة القانونية؛ الذكاء الاصطناعي؛ اللغة.

1. Introduction: The importance of translation, as the only means that facilitate communication among peoples, has made it indispensable across various scientific fields despite the continuous change and development of translation tools. Translation methods have evolved from traditional manual human practices to digital tools. In recent years, artificial intelligence has emerged as one of the most prominent of these tools, given the accuracy it demonstrates and the speed with which

tasks are completed. However, the high efficiency displayed by artificial intelligence in recent years has also created numerous challenges related to reliability, ethics, and other concerns. Many tools have become widely used and have formed a practical alternative to human translators, such as DeepL and Google Translate, as well as conversational tools like ChatGPT, DeepSeek, Gemini, and others.

Among the scientific fields most influenced by AI-enhanced translation is the field of legal studies. This domain is characterized by the precision of its terminology. The transition from human translation to AI-based translation represents a highly sensitive step due to the potential risk of inaccurate rendering of legal terms. This requires artificial intelligence systems to rely on vast datasets that enable them to handle legal texts with flexibility and accuracy. This concern regarding the difficulty of AI in dealing with legal texts in translation, compared with other scientific disciplines, has led us to adopt a bibliometric analysis approach in order to assess the extent to which scientific publications have contributed to enriching this field and to explore possible future trends. Accordingly, the following questions are raised:

RQ1: What is the distribution of AI and legal translation Publications by year between 1975 and 2025?

RQ2: What are the most relevant journals and authors in the field of AI and legal translation?

RQ3: What are the most productive countries in the research area of legal translation in the age of AI?

RQ4: What are the primary research keywords concerning AI and legal translation between 1975 and 2025?

2. Literature Review:

2.1 From Human Translation to Technological Translation: Innovation has contributed to the transformation of many traditional issues into technological ones, where, alongside research and development (R&D), knowledge, and other factors, it has led to a shift away from the prevailing view of reliance on physical assets. Companies have begun to turn their attention to intangible

capital, which focuses on the components of human capital, structural capital, and relational capital (AFIA K, 2025).

The history of linguistic transfer technology reflects humanity's ongoing quest to overcome language barriers through innovation. From manual linguistic transfer practices based on cultural and contextual understanding to the emergence of (MT) systems, this evolution has profoundly shaped the way people communicate across languages. The integration of artificial intelligence into linguistic transfer is the latest chapter in this journey, offering significant transformative potential while also posing complex challenges (Roya S, 2025).

For centuries, linguistic transfer relied entirely on human expertise, combining linguistic skill and cultural insight to convey meaning effectively. Translators played a key role in important historical moments, such as the Linguistic transfer of Greek philosophy into Arabic during the Islamic Golden Age, or the dissemination of Renaissance knowledge through Latin texts. These efforts emphasized accuracy, creativity, and a deep understanding of cultural differences, making human translators indispensable in spreading knowledge and promoting cultural exchange between civilizations. The 1950s saw a radical shift with the emergence of rule-based machine translation (Amjad M.B et al., 2026; Roya, 2025).

In the 1990s, a new paradigm emerged (SMT), a data-driven approach that relies on large corpora of parallel translated texts to discover patterns and probabilities. Unlike rule-based Linguistic transfer, statistical Conversion eliminated the need to create comprehensive linguistic rules, which contributed to improved Conversion quality, especially in handling ambiguity. However, challenges remained in dealing with idiomatic expressions, cultural differences, and long texts, highlighting the need for more sophisticated solutions (Amudha P, 2021).

2.2 Legal Translation at the Core of Artificial Intelligence: During the first wave of AI development in laboratories, many setbacks and mistakes occurred. One of the most notable errors in the field of conversion took place during the Cold War between the United States and the former Soviet Union. At that time, an artificial intelligence system was developed to translate Russian communications, but the results were disappointing. For instance, the phrase *"the spirit is willing,*

but the flesh is weak” was translated as *“the vodka is good but the meat is rotten.”* This failure led the United States to reduce funding for artificial intelligence research on several occasions. However, those who follow the evolution of AI in conversion can observe that such errors have gradually diminished over time, and translation systems have become increasingly accurate, in some cases even surpassing human performance (H. Sheikh et al, 2023).

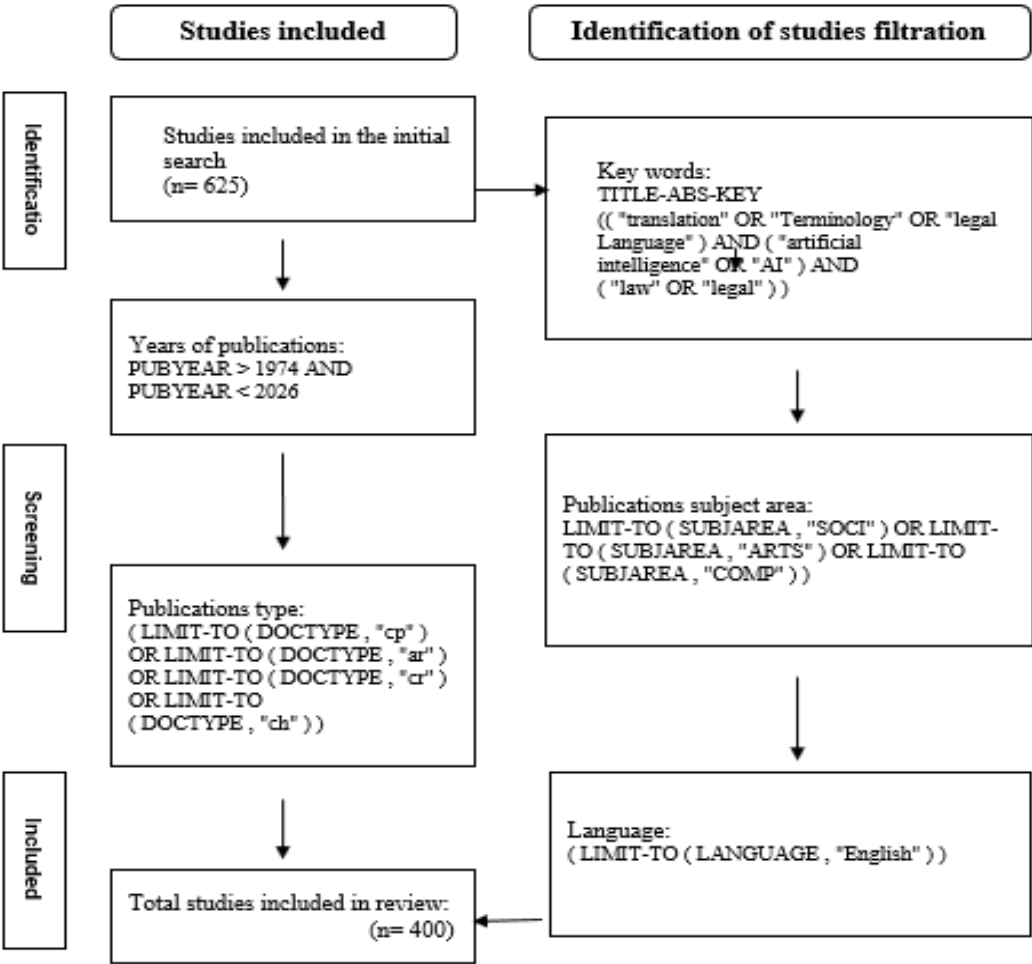
legal documents require the highest levels of precision. Although artificial intelligence tools are faster and more efficient, their ability to comprehend the subtle legal complexities that a human translator can master remains limited. While AI excels at handling technical terminology and maintaining the structural coherence of a text, it often struggles with translating highly nuanced technical expressions. In contrast, the human translator—despite occasionally making terminological errors—demonstrates a better understanding of these elements. This situation highlights the necessity of collaboration between human expertise and artificial intelligence (Amjad Mohammad Badah et al, 2026).

3. Materials and methods: This review aims to reveal the profile of the studies carried out on Artificial Intelligence in legal conversion for the last few decades. To achieve this, a bibliometric analysis review was conducted in this study to identify research foci and anticipate future research directions in an academic field. This research was conducted on 03-03-2026, the Scopus data bases was used in this search. The initial search revealed 625 articles in Historical Evolution of "AI in the legal conversion, the keywords that were used: TITLE-ABS-KEY ; (("translation" OR "Terminology" OR "legal Language") AND ("artificial intelligence" OR "AI") AND ("law" OR "legal")) AND PUBYEAR > 1974 AND PUBYEAR < 2026 AND (LIMIT-TO (SUBJAREA , "SOCI") OR LIMIT-TO (SUBJAREA , "ARTS") OR LIMIT-TO (SUBJAREA , "COMP")) AND (LIMIT-TO (DOCTYPE , "cp") OR LIMIT-TO (DOCTYPE , "ar") OR LIMIT-TO (DOCTYPE , "cr") OR LIMIT-TO (DOCTYPE , "ch")) AND (LIMIT-TO (LANGUAGE , "English"))).

This research covered the last years from 1974 to 2025. Finally, the research language used articles, chapters, conferences published in English language excluded any other languages, Moreover, the final articles used in this review were 400 articles. This research Prabandhan: Indian

Journal of Management • July 2025 59 utilizes VOSviewer, a tool designed for generating bibliometric maps and equipped with an advanced clustering algorithm. Additionally, being an open-source application, it is widely prevalent among academicians.

Fig.1. PRISMA Framework



Source: PRISMA Framework

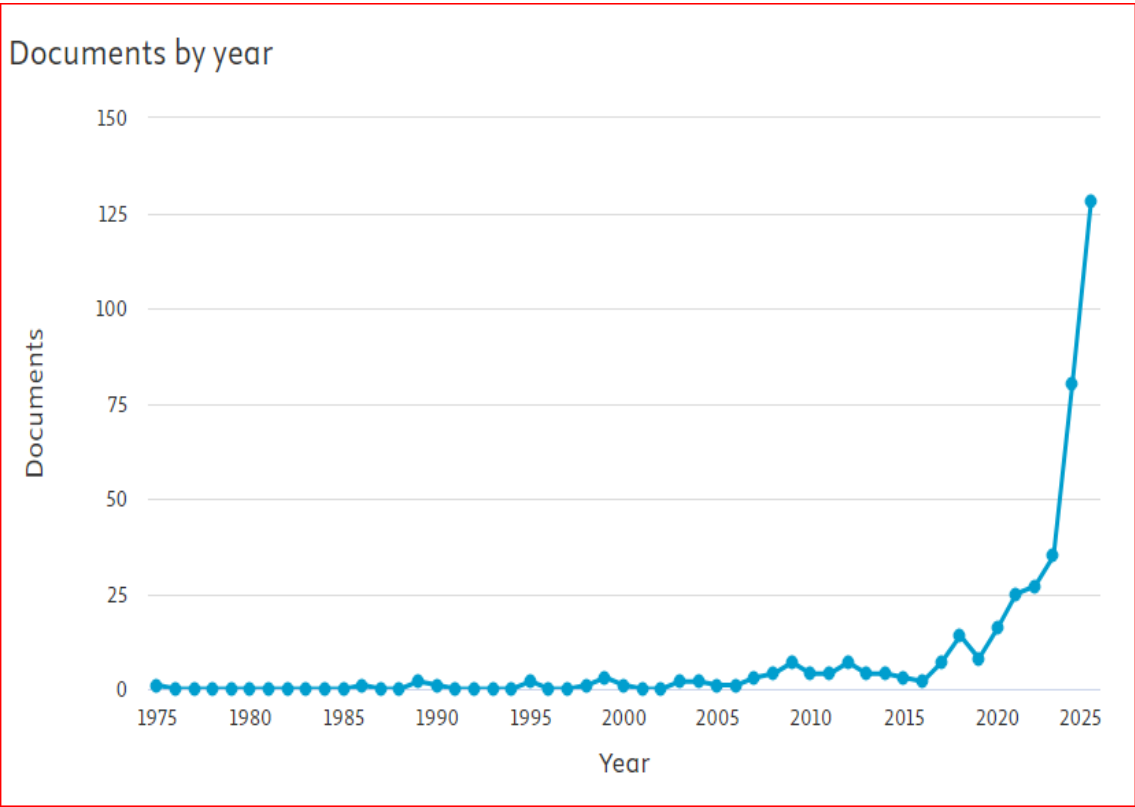
4. RESULTS AND DISCUSSION: This review reveals the research profile of studies on AI and judicial translation (1975–2025). The findings of this review were discussed based on the research questions.

4.1 The distribution of publications between 1975 and 2025: To address the first finding, an analysis was conducted of the publication years of the articles from 1975 to 2025. It was noticed that the papers were primarily published in the previous couple of years; in the year 2025, a total number of 126 publications was published concerning judicial conversion. Since 2019, scientific publications related to judicial conversion using artificial intelligence have witnessed a significant

increase. The number of publications rose from 22 scientific papers in 2019 to 48 papers in 2023, followed by rapid growth during 2024 and 2025, reaching 76 and 126 publications, respectively (See Fig. 2).

This development appears quite logical given the remarkable progress experienced by artificial intelligence, particularly through its expanding use in academic research, such as the use of tools like ChatGPT, DeepSeek, and other similar technologies. This development confirms that scientific publications on judicial conversion will experience wider dissemination in the coming years. However, conversion is likely to increasingly rely on machines rather than humans, as artificial intelligence continues to demonstrate greater accuracy and efficiency year after year, outperforming humans in many areas of conversion.

Fig.2. distribution of documents by Year



Source: Scopus database

4.2 The most relevant journals and authors about legal translation and A I: In the content analysis made for the most cited journals, "Total Publication, "Total Citation", Cite Score of the journal, "The most cited article, "Times cited, and "Publisher" was chosen as the analysis criteria as presented in Table 1. This table shows that the most productive journal concerning AI in the judicial Interpretation was "CEUR Workshop Proceedings", with a total general publications number of 20638 and a total citation of 18707. Secondly, Frontiers in Artificial Intelligence and Applications with a total publications number of 3878, a total citation of 2632, Thirdly, International Journal for the Semiotics of law with a total publications number of 379 and a total citation of 954.

It can be observed from Table 1 below that most of the scientific journals have a high number of citations. For example, even the journal ranked tenth, International Journal of Advanced Computer Science and Applications, has 5,428 publications and 14,628 citations. It is also noticeable that the publisher Springer Nature is the most present in the subject of our study, appearing five times among the top ten journals extracted from the Scopus database.

Table 1. The Top 10 Highly Productive Journals (1975-2025)

	Journal	TP	TC	Cite score	The most cited articles	Times cited	Author (year)	publisher
01	CEUR Workshop Proceedings	20638	18707	0.9	Overview of the "Voight-Kampff" Generative A-I Authorship Verification Task at PAN and ELOQUENT 2025	23	Karlgren, J. et al (2025)	CEUR-WS
2	Frontiers in AAI and Applications	3878	2632	0.7	Exploiting GenAI for Plan Generation in BDI Agents	12	Battistini, R. et al (2025)	IOS Press
3	International Journal for the Semiotics of law	379	954	2.5	Russian Aggression against Ukraine in the Media Discourse of Asian Countries (Using the Example of China and Japan): Literature Review	6	Pereloma, T. et al (2025)	Springer Nature

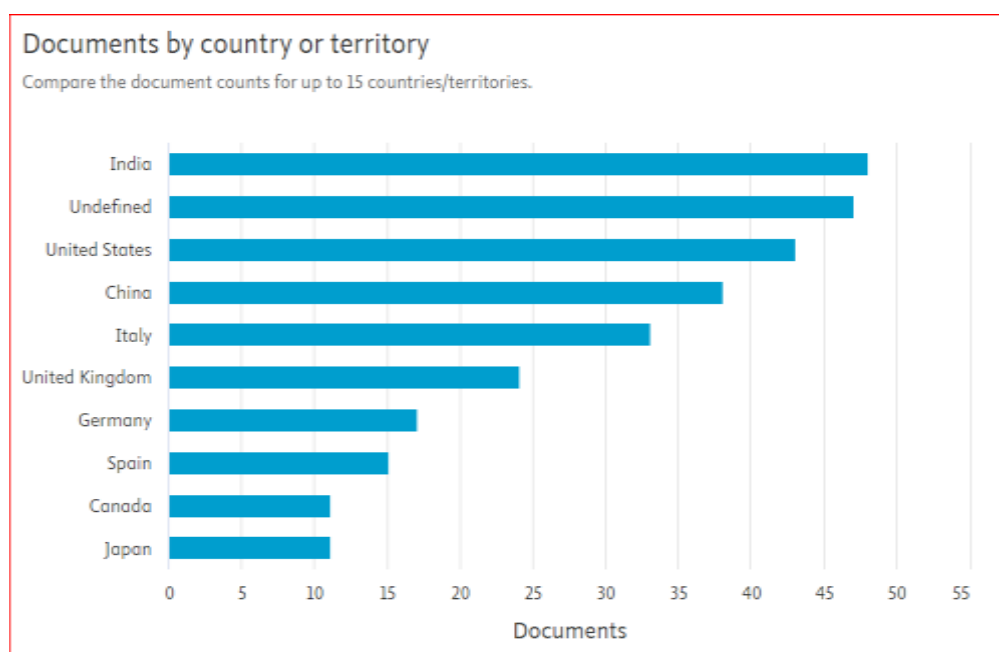
4	International Journal of Language and laww	30	27	0.9	A Comparative Study of Accuracy in Human vs. Ali Translatoonn of Legaal Documents into Arabic	6	Alghathian, G.A. (2025)	Language and laaw Editorial Office
	AAI and laaw	102	1087	10.7	Code is llaw: how COMPAS affects the way the judiciary handles the risk of recidivism	5	Schubert, M. (2025)	Springer Nature
5	Lecture Notes in Networks and Systems	53194	55560	1.0	Energy-Aware Reliable Routing with Blockchain Security for Heterogeneous Wireless Sensor Networks	4	Karthikeyan, R. et al (2025)	Springer Nature
6	Access to Justice in Eastern Europe	263	415	1.6	CRIMINAL LIABILITY FOR PAID DISINFORMATION IN THE DIGITAL WORLD: A COMPARATIVE STUDY BETWEEN UAE llaw AND THE EUROPEAN DIGITAL SERVICES ACT (DSA)	3	Alkrisheh, M.A. (2025)	Access to Justice in Eastern Europe
7	Advances in Intelligent Systems and Computing	29624	26852	0.9	Deep learning techniques: an overview		Amudha, P. (2021)	Springer Nature
8	Indian Journal of Information Sources and Services	148	660	4.5	Educational Disparities in the Digital Era and the Impact of Information Access on Learning Achievements	3	Shamsudinova, I. et al (2025)	The Research Publication
9	Intelligent Systems Reference Library	912	2261	2.5	AI-Based Games as Novel Holistic Educational Environments to Teach 21st Century Skills	3	Papadimitriou, S. (2025)	Springer Nature
10	International Journal of Advanced Computer Science and Applications	5428	14628	2.7	AI-Powered Learning Pathways: Personalized Learning and Dynamic Assessments		Aboraya, W. et al (2025)	Science and Information Organization

Source: Scopus Database

4.3 The Most Productive Countries, Academic Institutions, and Research Areas: In order to address the question regarding the distribution of countries' interest in the topic of AI and judicial Interpretation over time, the ten countries with the highest scientific output on our topic were selected. Among these, India led with 48 scientific publications, with the School of Computer Science and Engineering, Vellore Institute of Technology, Chennai Campus, Chennai, as shown in Table 02 below. USA comes second in terms of scientific output on the same topic, with 43 publications, and through the Computer Sciences Division, Department of Electrical Engineering and Computer Sciences, Electronics Research Laboratory, Berkeley, CA 94720, this subject has received a substantial amount of publication attention.

It appears that developed countries are the most active in publishing on the topic of our study. These include the United States, Italy, the United Kingdom, Germany, Spain, Canada, and Japan, which together form the Group of Seven. Furthermore, India appears as a leading country on the global scene, followed by China in third place. These countries are emerging economies that belong to the BRICS group. Meanwhile, developing countries and African countries are almost entirely absent from the scientific production related to this field.

Fig.3. distribution of documents by Country



Source: Scopus database

Table 2. The Top 10 Countries and Institutions

country	Educational institution	Authors (Years)	tp
India	School of Computer Science and Engineering, Vellore Institute of Technology, Chennai Campus, Chennai	Sukanya G.; Priyadarshini J. (2021)	48
USA	Computer Sciences Division, Department of Electrical Engineering and Computer Sciences, Electronics Research Laboratory, Berkely, CA 94720	Zadeh L.A. (1975)	43
China	Basic Teaching Department, Wanjiang University of Technology, Ma'anshan, Anhui, 243031	• Bi, ShengqinSend mail to Bi S. (2020)	38
UK	• Oxford Internet Institute, University of Oxford, 1 St Giles', Oxford, OX1 3JS, United Kingdom	Mökander, Jakob (2022)	33
Germany	• European New School of Digital Studies, European University Viadrina, Germany	Hacker, Philipp (2023)	17

Source: Scopus Data Base

4.4 Index Keyword Co-occurrence Analysis:

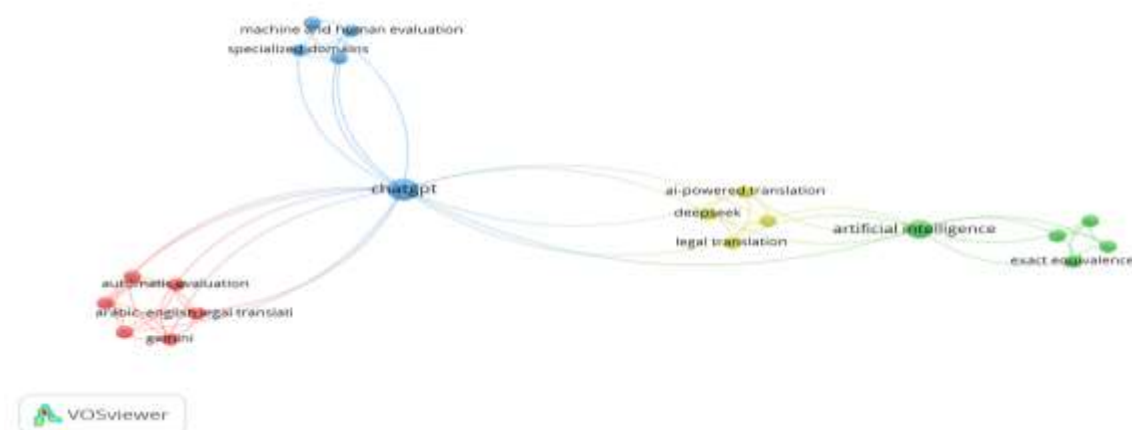
The Index Keyword Co-occurrence Analysis generated using VOSviewer illustrates the conceptual structure of research on AI-enhanced judicial Interpretation by mapping the relationships among frequently occurring keywords in the dataset. The visualization reveals several thematic clusters that represent the main research directions in this field. At the center of the network appears ChatGPT, which functions as a highly connected node linking multiple thematic clusters. Its central position indicates its growing importance as a tool used in recent studies on AI-assisted Interpretation and evaluation processes. The blue cluster surrounding ChatGPT includes terms such as *machine and human evaluation* and *specialized domains*, suggesting that a significant portion of the literature focuses on assessing the performance of AI systems in specialized Interpretation contexts, including judicial texts.

Another important cluster, shown in yellow, connects AI-powered Interpretation, DeepSeek, and legal Interpretation. This cluster reflects the technological dimension of the field, highlighting the emergence of advanced AI models designed to support or automate translation tasks within legal contexts. The proximity of these keywords indicates a strong research interest in integrating modern

AI models into legal translation workflows. The green cluster is organized around the broader concept of artificial intelligence, which is linked to terms such as *exact equivalence*. This cluster emphasizes theoretical and linguistic concerns, particularly the challenge of achieving semantic precision and terminological accuracy in legal translation through AI technologies.

Meanwhile, the red cluster focuses on evaluation and language-specific applications, including Arabic-English legal Interpretation, automatic evaluation, and Gemini. This suggests that part of the research community is examining the performance of AI tools in specific language pairs and exploring automated methods for evaluating translation quality. Overall, the network structure demonstrates that research on AI-enhanced legal translation is developing around three main dimensions: technological development of AI translation systems, evaluation of AI translation quality, and linguistic challenges related to legal equivalence. The central role of ChatGPT further indicates the rapid integration of large language models into legal translation research, reflecting a shift toward more advanced AI-driven translation solutions.

Fig. 4 keywords co-occurrence



Source: VOSviewer

Conclusion: The intersection of law and AI-powered translation has seen rapid growth in recent years, with legal translation expanding from legal disciplines to technical disciplines, primarily computer science. Scientific contributions have been concentrated mainly in developed countries, particularly the G7 countries, and to a lesser extent in emerging countries, particularly the BRICS countries such as India, which has been a global leader, followed by China, with a clear

absence of developing countries, particularly African countries. Based on this, it is expected that research related to AI-enhanced legal rendering will increasingly focus on computer-related sciences in the coming years, as a result of the superiority of AI and the frequent reliance on it. The results of developing countries lagging behind can be explained by their delay in paying attention to intangible capital, of which artificial intelligence is one of the main elements. Our study finds that progress in scientific research on AI-enhanced rendering is contingent on countries being among the knowledge-based economies that focus primarily on knowledge, innovation, artificial intelligence, and other factors.

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