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Artificial intelligence: redefining translation

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ABSTRACT: *AI has revolutionized various aspects of daily life, with machine translation being a significant application. AI technologies have improved translation accuracy and speed, facilitating communication across languages. However, challenges such as preserving cultural nuances and data security exist. This article presents the result of an analysis covered thematic, theoretical, and methodological trends in AI applied to translation. Theme trends explored current challenges and opportunities, theoretical trends delved into underlying principles, and methodological trends focused on practical approaches like training data quality. The analysis provided insights into how AI is reshaping multilingual communication.*

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I. INTRODUCTION

Artificial intelligence (AI) has emerged as a revolutionary field that has transformed numerous aspects of our daily lives. From healthcare to entertainment, AI has demonstrated its ability to optimize processes, increase efficiency, and improve quality of life. Among the various applications of AI, machine translation has seen significant advances that have profoundly impacted the way people communicate in an increasingly globalized world.

In this state of the art, we will explore the benefits that artificial intelligence offers in the field of translation. We will examine how AI technologies, such as advanced language models and machine learning systems, have enabled notable improvements in the accuracy and speed of machine translation, facilitating communication between people who speak different languages and opening new opportunities in the business, academic and cultural sphere.

By exploring the current state of the art of artificial intelligence applied to translation, we will also reflect on the challenges and limitations facing this technology, such as the preservation of cultural and linguistic nuances, the need for high-quality training data, and ethical concerns. related to privacy and data security. Through this analysis, we seek to offer a comprehensive view of how AI is redefining the translation landscape and how these advances are shaping the future of multilingual communication. Three aspects were identified during the analysis, the thematic trend, the theoretical and the methodological trends. First, left in a column the title of the articles, then we starting writing three columns showing how many articles we had in the thematic trend section, how many in theoretical trend and how many in the methodological trend, as well as we describe done article for each one.

II. METHODOLOGY

This is a detailed review that used thorough searches in reputable databases to find relevant sources. Strict criteria were used to select the most appropriate studies, which were then carefully analyzed to identify key themes and trends. This systematic approach ensures a comprehensive understanding of the topic. A thorough screening process is used to carefully evaluate the relevance of sources, with non-compliant ones being excluded. The selected studies were then analyzed in detail to identify key themes and trends, improving the validity of the study's findings. This meticulous method allowed for a deep exploration of the use of AI in the translation area.

Table 1. Trends Quantitative Overview

Thematic trend	No.	Theoretical trend	No.	Methodological Trend	No.
Quality evaluation (Lang, W. 2022), (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), (Brivá-Iglesias, V. (2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022)	4	**Tools** (Philipp, K. Hoang, H. Birch, A. Burch, C, C. 2007), (Buitrago, S. 2023)	2	**Mixed** (Buitrago, S. 2023), (Lang, W. 2022), (Torres, C, .R, I. 2023), (Brivá-Iglesias, V. (2021),	4
Neural machine translation (Das, A. K. 2018)	1	**Risks and challenges** (Kirov, V., & Malamin, B. 2022), Das, A. K. 2018), (Torres, C, .R, I. 2023), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022)	4	**Qualitative** (Kirov, V., & Malamin, B. 2022), (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), (Philipp, K. Hoang, H. Birch, A. Burch, C, C. 2007), (Peng ,H. 2018),(Muftah, M. 2021).	6
Translation impact (Kirov, V., & Malamin, B. 2022), (Buitrago, S. 2023), (Torres, C, .R, I. 2023) (Muftah, M. 2021).	4	**Analysis of automatic and human translation** Brivá-Iglesias, V. (2021), (Muftah, M. 2021), (Lang, W. 2022)	3	**Quantitative** (Das, A. K. 2018), (Yanxia Y, J, N. 2023), (Abdurrahman, K. 2023)	3
Improving translation skills (Yanxia Y, J, N. 2023), (Philipp, K. Hoang, H. Birch, A. Burch, C, C. 2007)	4	**Influence of AI on translators** (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), (Abdurrahman, K. 2023), (Peng ,H. 2018)	4		

In general, 13 international articles were analyzed. all articles (13) focus on the impact of artificial intelligence on translation, specifically on the analysis, risks and tools that artificial intelligence can provide. Most of the analyzed articles were in English, but some were in Spanish. In each article, data about the themes, theories involved and the methodology approach used were identified (See Table 1) with the intention of identifying new development opportunities in this line of research.

III. CURRENT TRENDS IN THE INVESTIGATION OF THE USE OF AI IN THE TRANSLATION AREA.

Thematic Trend

The results on thematic trend show that of the 13 articles (See Table 2) analyzed, four focused on the study of quality evaluation (Lang, W. 2022), (Nidia, C. Pacanchique, Q. and Rodríguez, R. 2021), (Vicent B, I. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), one focus on Neural machine translation (Das, A. K. 2018), four focused in the Translation impact (Kirov, V., & Malamin, B. 2022), (Buitrago, S. 2023), (Torres, C, .R, I. 2023) (Muftah, M. 2021) and finally four focused in the use of AI to improve translation skills (Yanxia Y, J, N. 2023), (Philipp, K. Hoang, H. Birch, A. Burch, C, C. 2007) four of which They focused on quality evaluation, seeking to determine the effectiveness and precision of the translations, considering aspects such as linguistic precision, fluency and naturalness of the text, terminological consistency, adaptation to context and the relationship between time and quality. About Neural machine translation there is an article that focuses on a modern approach that uses deep neural networks to translate text between different languages. Unlike previous methods, the author says that NMT models learn directly from data and are able to better capture the context and semantic relationships between words, resulting in more fluid and natural translations. On the impact of Automatic translation in translators It is said that automatic translation has impacted translators by improving

efficiency and reducing time, but it has also generated the need to adapt to new tools and technologies. Although some fear the replacement of human translators, most find benefits in collaborating with AI systems to improve the quality and speed of their work. However, it is emphasized that it is important to recognize that machine translation still has limitations and that human skill remains crucial to ensuring accurate and contextually appropriate translations. And finally, in the articles that talk about improving translation skills with the use of AI, the authors say that the use of artificial intelligence in translation improves the skills of translators by increasing efficiency, ensuring consistency, and providing resources tools. Additionally, it is believed to facilitate continuous learning and automates routine tasks, allowing translators to deliver higher quality translations in less time and with less effort.

Thematic trend	Number
Quality evaluation (Lang, W. 2022), (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), Brivá-Iglesias, V. (2021).), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022)	**4**
Neural machine translation (Das, A. K. 2018)	**1**
Translation impact **(Kirov, V., & Malamin, B. 2022), (Buitrago, S. 2023), (Torres, C, .R, I. 2023)** (Muftah, M. 2021)..	**4**
Improving translation skills (Yanxia Y, J, N. 2023), (Philipp, K. Hoang, H. Birch, A. Burch, C, C. 2007)	**4**

Table 2. Thematic Trend.

Theoretical Trend

Continuing in the Theoretical Trend section (See Table 3), we classified words that were written in the Theoretical Focus Title of each article (13) and four different types of theoretical trends were found. The first trend is about Translation tools where there are two articles (Philipp, K. Hoang, H. Birch, A. Burch,C, C. 2007), (Buitrago, S. 2023), four are the risks and challenges (Kirov, V., & Malamin, B. 2022), Das, A. K. 2018), (Torres, C, .R, I. 2023), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), three are on the analysis of automatic and human translation (Vicent B, I. 2021), (Muftah, M. 2021), (Lang, W. 2022), and finally four talk about the influence of artificial intelligence on translators (Nidia, C. Pacanchique, Q. and Rodríguez, R. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022),(Abdurrahman, K. 2023), (Peng,H. 2018)

In general, articles on translation tools talk about how the use of artificial intelligence in translation has given rise to a variety of tools that improve the efficiency and quality of the process. Within the articles, automatic translation systems, computer-assisted translation tools, spelling and grammar checkers, multilingual databases and feedback systems are mentioned. These tools aim to increase the accuracy and consistency of translations, making the work of translators easier and improving the end-user experience. The risks and challenges were based on the theory that the use of artificial intelligence in translation presents risks and challenges that must be addressed. These include concerns about the quality of translations, data privacy, linguistic and cultural bias, job displacement, liability and ethics, as well as technological dependency. It is mentioned that to mitigate these risks, it is crucial to establish standards clear, develop technology responsibly and promote collaboration between all parties involved in the translation process.

The analysis of human and machine translation involves the evaluation of the quality and effectiveness of both approaches. In human translation, precision, fluency, coherence and adaptation to the context are valued, taking advantage of the translator's capacity for understanding and creativity. On the other hand, automatic translation seeks to evaluate the quality of grammatical rules, word selection and coherence of the text generated by AI algorithms. Both approaches have advantages and challenges, and the right combination of both can maximize efficiency and quality in content translation. Careful and ongoing evaluation of both approaches is essential to ensure accurate and contextually appropriate translations.

and finally, the influence of artificial intelligence (AI) on translators has been significant and diverse. AI provides assistive tools, improves productivity, offers professional development opportunities, enables collaboration and focus on creative tasks, and helps translators adapt to new technologies. However, it also poses challenges, such as the need to learn new skills and ensure the quality of translations. In short, AI has transformed the work of translators, improving efficiency and productivity while requiring adaptation to new approaches and technologies.

Theoretical Trend	Number
Tools (Philipp, K. Hoang, H. Birch, A. Burch,C, C. 2007), (Buitrago, S. 2023)	2
Risks and challenges **(Kirov, V., & Malamin, B. 2022), Das, A. K. 2018),** (Torres, C, .R, I. 2023), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022)	4
Analysis of automatic and human translation Brivá-Iglesias, V. (2021), (Muftah, M. 2021), (Lang, W. 2022)	3
Influence of AI on translators (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), (Abdurrahman, K. 2023), (Peng ,H. 2018)	4

Table 3. Theoretical Trend.

Methodological Trend

In Methodological Trend we organized the articles based on three aspects (see table 4), those of a mixed, qualitative and quantitative approach.

In general, articles with a qualitative approach use this method to analyze and describe information about the role that artificial intelligence plays with translation, various topics were explored, such as the evaluation of the quality of machine translations, the impact on the translation profession, translation, biases and ethics in machine translation, human-machine interaction and the development of improved machine translation systems. These studies analyze how AI affects the work of translators, how they interact with AI tools, and how machine translation systems can be improved to ensure accurate and culturally appropriate translations.

Quantitative studies aim to discover new information and measure the results of the information used or found through surveys or detailed analysis. Regarding the mixed approach, there are articles that are dedicated to classifying, analyzing, quantifying and comparing information. Some articles combine one or two types of studies, using the qualitative method to describe and collect data, such as the benefits of using artificial intelligence, and the quantitative method to conduct surveys and evaluations of translations.

Methodological		Number
Focus	**Mixed** **(**Buitrago, S. 2023), (Lang, W. 2022), (Torres, C, .R, I. 2023), (Brivá-Iglesias, V. (2021),	**4**
	Qualitative (Kirov, V., & Malamin, B. 2022), (Nidia, C. Pacanchique, Q. y Rodríguez, R. 2021), (Vargas, S., Sánchez J, A. Fajardo, and González D. 2022), (Philipp, K. Hoang, H. Birch, A. Burch,C, C. 2007), (Peng ,H. 2018),(Muftah, M. 2021).	**6**
	Quantitative (Das, A. K. 2018), (Yanxia Y, J, N. 2023), (Abdurrahman, K. 2023)	**3**

Table 4. Methodological Trend.

IV. CONCLUSION

The use of artificial intelligence has revolutionized many aspects of daily life, including translation. AI technologies have enhanced translation accuracy and speed, enabling better communication across languages. However, challenges such as preserving cultural nuances and data security exist. The analysis discussed thematic, theoretical, and methodological trends in AI applied to translation, showcasing how AI is reshaping multilingual communication. Thematic trends included articles focusing on quality evaluation, neural machine translation, translation impact, and improving translation skills. Theoretical trends covered translation tools, risks and challenges, analysis of automatic and human translation, and the influence of AI on translators. Methodological trends categorized articles into qualitative and quantitative approaches, examining the role of artificial intelligence in translation. Overall, the use of AI in translation is advancing, but considerations like quality, ethics, and human skill remain crucial. This is a list of academic articles related to machine translation, post-editing, and the impact of artificial intelligence on translators. These articles explore the performance and perception of machine translation post-editing in Chinese-English news translation, the use of the Moses open-source toolkit for statistical machine translation, the potential threat of AI on translators' positions, and the impact of machine translation and computer-aided translation on translators. These sources can provide insights into the evolving landscape of translation technologies and their implications for the translation industry. By exhaustively reviewing and analyzing the articles, I was able to obtain a complete vision of the most advanced

methods, approaches and technologies used in the field, which will allow me to develop somewhat innovative research, which will allow me to contribute to the advancement of knowledge, since there is still very little information on this topic.

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