
| RESEARCH ARTICLE

Translation Studies in the Era of AI: Characteristics, Fields and Significance

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| ABSTRACT

With the development of artificial intelligence in translation research, it is possible to form a new perspective on translation studies, which is translation studies from the perspective of artificial intelligence. Translation studies from the perspective of artificial intelligence are fundamentally based on artificial intelligence and are characterized by intelligence, situationality, and integration. The research fields of translation studies from the perspective of artificial intelligence mainly include the study of translation product quality and effectiveness, the study of translation processes, and the study of translation teaching. The emergence of translation studies from the perspective of artificial intelligence not only promotes a rethinking of theoretical models in translation research but also advances the transformation of research methods, expanding and deepening the contents of translation teaching. The emergence of translation studies from the perspective of artificial intelligence not only promotes a rethinking of theoretical models in translation research but also advances the transformation of research methods, expanding and deepening the contents of translation research.

| KEYWORDS

Artificial Intelligence; Translation Studies; Neural Networks

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1. Introduction

Artificial intelligence refers to the use of manual operation to achieve intelligent evolution in machines and strengthen their automatic ability. Since the twenty-first century, human society has gradually stepped into the era of artificial intelligence, and new technologies such as machine learning, natural language processing, visual perception, pattern recognition, etc., have increasingly penetrated into various fields of education and research. The increasing artificial intelligence technology has greatly promoted the development of the translation field, giving rise to a large number of new technologies such as terminology management, translation memory, neural network machine translation, etc., and triggering epochal changes in translation research. The academic community has incorporated artificial intelligence technologies represented by deep learning, machine learning and neural networks into translation research, which is expected to form a brand new perspective of translation research, i.e., translation research under the perspective of artificial intelligence. However, so far, the connotation and significance of translation research from the perspective of artificial intelligence are not clear. For this reason, this paper will sort out the origins of translation research from the perspective of artificial intelligence and analyze its nature, characteristics, main research areas and significance with the following specific research questions: (1) What are the backgrounds of the times that form translation research under the perspective of artificial intelligence? (2) What are the attributes and characteristics of translation research in the field of artificial intelligence? (3) What are the research fields of translation research in the field of artificial intelligence? (4) What is the significance of translation research in the field of artificial intelligence?

1.1 Researching the background of translation research from the perspective of artificial intelligence

1.1.1 Artificial intelligence

Artificial intelligence uses anthropomorphic technology and logic systems to construct an intelligent operation system to ensure the orderly development of intelligence, which is a cross-cutting frontier discipline research field integrating computer technology and intelligent systems and is also an important part of computer science or intelligence science. Specifically, artificial intelligence can be interpreted from two aspects. On the one hand, artificial intelligence is a kind of machine learning ability, which is a machine simulating the behavior of human production and life, and then realizing intelligent thinking and activities, etc., which is the main reason for the birth of the Turing test; on the other hand, artificial intelligence has a complete theoretical foundation system, and it is an emerging discipline, and the Ministry of Education, in 2018, has made the content of the artificial intelligence system is recognized, which promotes the improvement of the content of the discipline in the field of artificial intelligence.

1.2 The origin of translation research from the perspective of artificial intelligence

Translation research, in the perspective of artificial intelligence, is essentially a fusion of artificial intelligence and translation research, formed in the development of artificial intelligence research and the rise of empirical translation research.

1.2.1 Development of Artificial Intelligence Research

The rapid development of Artificial Intelligence has led to a sudden and rapid change in translation technology, which is widely used in translation practice. As a result, the academic community has paid extensive attention to the phenomenon of machine translation and other translation technologies. Early research on machine translation mainly focused on computer-aided translation (CAT), and later, it gradually expanded to machine translation post-translation editing (MTPE) and interactive machine translation (IMT). Interactive machine translation is also known as interactive machine prediction or target text-mediated interactive machine translation. Church and Hovy (1993) first proposed the concept of interactive machine translation, whose core idea is to effectively integrate human translation accuracy and machine translation efficiency through the interaction between the user and the machine translation engine (Church & Hovy, 1993).

1.2.2 The emergence of empirical translation studies

Translation studies have always adopted a discursive approach, summarizing the common features or essence of translation phenomena and translation facts through logical deduction and inference of concepts and subjective judgments. Since the 1980s, empirical translation research has begun to appear and has triggered more and more extensive attention from the translation academy. Empirical translation research refers to observing and investigating the translation products or processes of translation corpus, obtaining data and evidence about translation products or translation processes by virtue of experimental means, and proposing a theoretical hypothesis or verifying a theoretical hypothesis on the basis of this (HU, 2020). On the one hand, its research uses experimental psychological data obtained by the audible thinking method, behavioral data obtained by keyboard logging and eye tracking, and neuroscientific data obtained by ERP and fMRI to explain the cognitive psychological process of translation practice. On the other hand, its research explores the common features of translation products and functions by observing and counting corpus data.

In view of the above, there is a fit between artificial intelligence and empirical translation research. Both are based on the observation and analysis of big data to summarize or generalize common features about specific facts or phenomena. Moreover, both emphasize the importance of specific or factual data in translation practice, with the difference that the latter adopts techniques and methods that include not only AI techniques but also experimental psychology methods, situational behavioral observation methods, and neuroscience methods. Therefore, there is an opportunity for mutual integration between AI research and empirical translation research, which can form a brand new research field of translation research under the perspective of AI.

2. The nature and characteristics of translation research in the view of artificial intelligence

The possibility of translation research from the perspective of artificial intelligence comes from the reality of the organic unity of artificial intelligence research and empirical translation research, which is essentially interdisciplinary research with the characteristics of both artificial intelligence and empirical translation research.

2.1 The nature of translation research from the perspective of artificial intelligence

Translation research under the perspective of artificial intelligence is based on the application of artificial intelligence technology, based on the theories of translation, linguistics, literature, socio-culture, psychology and cognitive science, etc., which depicts the essence of translation and the common characteristics of translation phenomena, explains the causes of specific translation

phenomena and predicts the possibilities of translation phenomena. Therefore, translation research from the perspective of artificial intelligence is interdisciplinary research. On the one hand, translation research itself is related to linguistics, literature and cultural studies and involves sociology, psychology, neuroscience, cognitive science and computer science, which belongs to interdisciplinary research; on the other hand, AI research focuses on the use of big data and involves the role of autonomous learning, deep learning and cognitive intelligence in the study of the translation phenomenon, and thus is closely related to statistics and mathematics, computer science, information science and other disciplines. To sum up, translation research in the field of artificial intelligence is oriented to translation research problems, exploring, explaining and predicting translation phenomena in the context of artificial intelligence, breaking down the barriers between multiple disciplines, and realizing interdisciplinary, multidimensional and synergistic cooperation.

In addition, translation research under the perspective of artificial intelligence provides a brand new research perspective. Translation research under the perspective of artificial intelligence can adopt theoretical models different from traditional translation research, such as the theoretical model that integrates connectionism based on linguistic big data and symbolism based on linguistic rules and common sense, unique research methods, such as intelligent means, artificial intelligence technology and data statistics methods, its own research field and research content, such as cognitive laws of neural network machine translation, and so on. The research in this field observes, analyzes and mines translation facts and translation data under the scenario of artificial intelligence, explores the translation trends and characteristics hidden in the data, and reveals the laws of occurrence and development of the translation phenomenon and its research conclusions not only need thinking, observation and induction, but also need the data enchantment and intelligent presentation, and thus have a strong objectivity and scientific nature. Therefore, translation research under the perspective of artificial intelligence is a brand new perspective of translation research.

There are four research perspectives in translation research, namely, philological perspective, linguistic perspective, socio-cultural perspective, psychological, cognitive perspective and artificial intelligence perspective. The philological perspective focuses on the study of translation strategies and techniques, emphasizing that translation should faithfully reproduce the content of the original text. Its representative scholars are Cicero, Jerome, Schleiermacher, and Tytler. The linguistic perspective advocates that translation research should be based on linguistic theories such as Chomsky's transformational generative grammar, Saussure's structuralist linguistics, Halliday's systemic functional grammar, pragmatics and cognitive linguistics, to "describe how to realize the translation text and the source text at the levels of vocabulary, syntax, discourse and pragmatics, syntactic, discourse and pragmatic levels of the translated text and the source language text, so as to scientifically explain the nature of translation and the translation process", represented by Nida and Catford (HU, 2012). The socio-cultural research perspective emphasizes that translation research should focus on the production and reception of translated texts in specific social, historical and cultural contexts, exploring how translation is manipulated by socio-cultural factors and how it affects the target language culture in a reverse way, as represented by Bassnet, Lefevere, Snell-Hornby, Even-Zohar and Nida. Even-Zohar and Toury. The psycho-cognitive perspective focuses on the cognitive process of bilingual processing from the perspectives of mental representations, cognitive units, and information processing paradigms, focusing on exploring the psychological mechanisms and cognitive modes, patterns, and characteristics of translators in the translation process represented by Sandra Halverson and Maxim Stamenov.

Among the above research perspectives, the philological, linguistic and socio-cultural perspectives focus on translation products and effects, while the cognitive-psychological perspective focuses on translation process research. The former focuses on the product and function of translation and pays attention to translation strategies and techniques, linguistic features of translated texts, cultural, political and historical influences on translation, etc., and mainly adopts qualitative research methods. The latter focuses on the psychological, cognitive and emotional factors of translators, mainly using experimental or observational methods. However, they lack the consideration of situational factors, and their conclusions are often one-sided.

Translation research under the perspective of artificial intelligence not only pays attention to translation products and effects and translation process research studies but also pays attention to scenario-related factors in translation facts, emphasizes the technological influencing factors of translation practice in the context of artificial intelligence, and explores the impact of artificial intelligence on translation facts based on human-computer interaction in the translation process as a scenario. This perspective argues that translation products and processes are not only influenced by the translator's idiosyncratic factors but also constrained by AI technology and inversely affect the interaction between the translator and the AI technology. In addition, this research perspective advocates the importance of AI scenarios, emphasizes the role of external AI scenarios in translation facts and practices, and focuses on the study of linguistic, cultural, social, psycho-cognitive, or technological issues related to translation in AI scenarios. Translation research from the perspective of artificial intelligence has three advantages. First, the research is based on the human-computer interaction conditions under artificial intelligence technology and a large number of translation facts and data in the age of artificial intelligence to summarize the common features of translation products and translation processes, which can effectively overcome the subjectivity and one-sidedness of previous translation research and make the research conclusions more objective and scientific. Secondly, the research attaches importance to holistic and regular features or principles such as translation

commonalities and translation norms, verifies or amends existing theoretical models, integrates commonality and individuality research, explores the differences in translators' individuality such as creativity, working memory, individuality, emotion, translation specialization, immersion time in the second language environment, and modes of accepting and outputting information, etc., and the differences in interaction with external resources of translation, using observational experiments, using observational experiments. Further research and inference based on individual translator data (Chiarello, Welcome & Leonard, 2012) are needed to overcome the neglect of personality difference factors in traditional translation research. Thirdly, the study integrates the static and dynamic influencing factors of translation, examines the linguistic, socio-cultural and psycho-cognitive factors of translation under the conditions of artificial intelligence, and breaks through the barrier of the established static influencing factors of traditional translation research. The perspective re-replaces translation products and translation processes in AI scenarios, analyzes relevant AI influencing factors, and reveals and generalizes the common features of translation based on external AI scenarios.

2.2 Characteristics of translation research from the perspective of artificial intelligence

Translation research under the perspective of artificial intelligence is a research perspective based on artificial intelligence technology scenarios, integrating artificial intelligence technology scenarios and translation research, which is characterized specifically by intelligence, scenario and integration.

2.2.1 Intelligence

The intelligence of translation research in the field of artificial intelligence means that the research object of translation research in the field of artificial intelligence has intelligent characteristics. Its research objects include intelligent translation products, including machine translation and translation product forms, including sound, which are far beyond the scope of traditional translation research. In addition, the intelligence of translation research in the field of artificial intelligence refers to the intelligence of the research means in this field, i.e., based on the translation facts of the artificial intelligence products such as machine translation based on pattern recognition technology, the characteristics of the translation essence or the translation facts are found from the neural network machine translation or intelligent translation.

2.2.2 Situationality

The in-depth combination of artificial intelligence technology and translation research expands and enriches the theory, research method and research content of translation research, prompts structural changes and innovations in translation research, and forms a new ecology of situationalized artificial intelligence translation research. At present, domestic and foreign translation research has shifted from micro-neurocognition to macro-situational cognition in the direction of (Muñoz, 2017), and the combination of micro-brain neural network level and socio-cultural level research expands the situational factors of translation research, enhances the ecological validity of translation research, and strengthens the fineness and scientificity of translation research. Currently, neurocognitive research on translation and interpreting is actually a "known field to be explored" (García, 2019), and some scholars have used experimental methods to explore the role of translator-environment interaction in the translation process (Cui & Zheng, 2021). To understand the nature of the whole process of translation under the condition of artificial intelligence, it is necessary to combine a variety of research methods to examine the role of artificial intelligence technology and environment on the emotional and cognitive state of the translator and to deepen the research on artificial intelligence in translation from the perspective of the needs of the translator's emotional and cognitive state. With the further development of AI research and the wider application of AI technology, the various perspectives of translation research will be further integrated to promote the study of situational models of AI translation.

2.2.3 Intergradability

The interactivity of translation research in the field of artificial intelligence refers to the interactive situation state of AI translation research that deeply integrates a series of AI technologies under the AI scenario, which is mainly divided into two aspects: theoretical research and application research.

Theoretically, computational psycholinguistics can construct computational models of language representation and cognitive mechanisms of language processing in the brain and models explaining human language processing mechanisms (Crocker, 2010), which provides important insights for the study of translation cognitive process. Translation research can construct a neurocognitive computational model of translation cognitive processing through interdisciplinary cooperation to characterize, interpret and predict translation cognitive behaviors, and at the same time, it can examine the influence of macro factors such as culture and history and micro factors such as personal experience, emotion, personality, etc., in order to construct a model of translation cognitive processing with stronger explanatory and predictive capabilities (LANG & HOU, 2022).

In terms of application, the intergradability of AI and translation research is mainly reflected in machine translation. Machine translation originated from Alan Turing's idea of using computers to imitate human intelligent behavior. The purpose of machine translation is to use machines to imitate human translation ability, which is an important part of artificial intelligence (FENG, 2018). With the development of artificial intelligence technologies such as big data and deep learning, machine translation has entered

the stage of “machine learning”. Academics have conducted more research on the integration of human-machine interaction, exploring the mechanism of composite intelligence, that is, the interaction between human translators and computer-assisted translation tools or machine translation results and post-translation editing, in order to ensure the quality of translation and reduce the cognitive burden on the translator (Carl & Schaeffer, 2017). According to O'Brien, the current machine translation technology can't fully present the cognitive operation of translators, but we can explore the way of interaction between translators and machine translation, examine the interaction process between translators' real working environment and translation aids or machine translation results, and even include the interaction process between translators and cloud resources, as well as the cognitive process of translators who complete the translation tasks with the help of cloud resources under the crowdsourcing project (O'Brien, 2017).

3. The main fields of translation research from the view of artificial intelligence.

Generally speaking, translation research in the view of artificial intelligence covers such research fields as translation computational model construction, translation product and effect research, translation process research and artificial intelligence or intelligent translation teaching research.

3.1 Translation calculation modeling

The construction of a computational model of translation under the perspective of artificial intelligence refers to a cognitive model that predicts the translation process by combining the digital representation of linguistics, computational psycholinguistics, socio-cultural, behavioral cognition and translation products. Since the theoretical framework of computational psycholinguistics generally focuses on a certain aspect of language processing and mainly focuses on the macro-level processing, and cannot focus on the specific implementation of algorithms at the neural level [Crocker 2010], however, Marr argues that it is important to start from the “computational layer”, “representation layer” and “physical layer” to “the “computational layer”. However, Marr believes that the cognitive process should be described in terms of “computational layer”, “representation layer” and “physical layer” (Marr, 1982), so the research on the cognitive process of translation should focus on the above three levels. The Noise Channel Model of the Translation Process proposed by Carl&Schaeffer (2017) and Lu Sheng et al. (2020) based on the Hidden Markov Model and machine learning method to predict the cognitive process of translation are the mathematical characterization of the translation process, which combines the linguistic model, cognitive-behavioral model and socio-cultural model, the translator's process of translation and his/her observable behavioral pattern with the final translation product, etc. to predict the cognitive process of translation. They combine linguistic and cognitive behavioral models with socio-cultural models, the translator's translation process and its observable behavioral patterns with his/her final translation product to predict the cognitive processing of translation and to validate its accuracy by using eye-movement and keystroke recording data. These studies are mainly limited to the “computational layer” and “representation layer” and have not yet penetrated into the “physical layer” of computational models. With the emergence of computational neuroscience, academics have begun to explore how parallel interactions between neurons fulfill specific functions in the brain's computational process, which opens up the exploration of the “physical layer” of translation cognitive processing.

3.2 Research on human-machine translation products and effects

The research on human-machine translation products and effects under the perspective of artificial intelligence refers to the discovery of product quality and effect differences between machine translation products and human translation products through observation, statistics and generalization of a large number of machine translation and human translation products, specifically including the exploration of language and text features of machine translation and human translation products at the levels of phonology, vocabulary, syntax, semantics and collocation, as well as the research on style and cultural acceptance. The former focuses on analyzing the overall linguistic features of translation products, such as the number of morphemes, the number of class symbols, the ratio of morphemes/class symbols, lexical density, lexical richness, the average sentence length and high-frequency words, etc., the frequency or tendency of the application of typical lexical or syntactic structures, as well as the clusters of words, collocations, class connectivity, and semantic rhymes of the translated texts; the latter focuses on discovering the socio-cultural features of translation products. For example, Li Fengqi studied the English-Chinese translation quality of English professional translation learners and neural network machine translation system from the comparison of fidelity, fluency, terminology translation, style and cultural acceptance (Li, 2022); Wang Zhijun (2022) found that machine translation is insufficient in word collocation, which needs manual literacy and reconstruction, so it is necessary to cultivate the translator's ability of lexical meaning reconstruction, and according to the relevant theories of cognitive semantics and the practical experience of translation, the translator's According to the relevant theory of cognitive semantics and translation practice experience, the cognitive process of meaning reconstruction of translators includes two interacting parts: the assumption and verification of relevant lexical meanings,

which provides guidance for translation practice; Lu (2023) compares the cognitive process, ability and quality of simultaneous interpreting between human and machine, and finds that there are significant differences between human and machine in terms of the processing object, hierarchy, paths and mechanisms, and the use of strategies, and that the two differ significantly in terms of a number of competence elements, and also in terms of product quality and causes of problems. It has also been found that there are significant differences between humans and machines in terms of processing objects, levels, paths, mechanisms, strategies, etc. There are also obvious differences between the two in terms of many competence elements and in terms of product quality and causes of the problems, and it is proposed that we can explore the specific mechanisms and modes of collaborative work between the two and develop the relevant, interactive machine simultaneous interpreting applications, and innovate the way of simultaneous interpreting [LU 2023].

3.3 Research on the translation process

The study of translation process under the perspective of artificial intelligence aims to investigate human-computer interactive translation under the conditions of artificial intelligence, the study of translation micro-neurocognition and macro-situational cognitive process, as well as the combination of micro-brain neural network level research with macro-socio-cultural level research.

The interactive learning approach to artificial intelligence supports the collection of user feedback for further model performance enhancement as the user works with the translation tool. Interactive learning protocols are easy to integrate into machine translation models and combine with a variety of advanced techniques to achieve very good performance of machine translation models. Therefore, interactive machine translation integrates the translation process during the training of the translation model and combines part of the human interaction to achieve more satisfactory translation results. For example, Zuo (2021) elucidated the technical basis for the application of AI technology to English translation, which can provide an intelligent and interactive working environment for translators by virtue of the advantages of AI technology in terms of its high degree of integration and data processing. Wang et al. (2023) proposed that in the context of human-computer interactive translation, it is necessary to establish a harmonious symbiosis ecosystem between humans and machines, promote technological innovation centered on the humanistic concept, emphasize the security of translation data and technological ethics, and improve translators' technological capabilities and humanistic qualities. Geng and Hu (2023) propose that AI-assisted post-translation compilation is a new direction of human-computer interactive translation mode under the perspective of artificial intelligence and believe that AI-assisted post-translation compilation can provide Chinese-to-English language-to-Chinese translation proofreading, touch-ups, evaluation, feedback and suggestions, and at the same time, it can assist in the teaching of translation from the aspects of translation correction^[21].

Since entering the 21st century, interpreting and translation research has begun to be widely aligned with neurocognitive research, and García (2019) suggests that neurocognitive research in interpreting and translation is a known area to be explored. Zhao (2018) explained the auxiliary role of information translation technology combined with cognition on translation practice; Qian et al. (2022) explored the effect of neural network machine translation error types on the allocation of translators' attentional resources. In addition, many studies have begun to pay attention to the cognitive state of translators in real work situations and accordingly adopted ethnographic fieldwork research methods such as observation method, in-depth qualitative interviews (Risku, 2017), and even experimental methods (Cui & Zheng, 2021), to explore the effects of the interaction between translators and the environment on the translation process. More and more scholars have begun to use neuroscientific methods to explore the translator's translation process in social environments, integrating social factors into the experimental design of the study and developing social neuroscience (Ibáñez, Sedeño & García, 2017). These studies recognize that human cognition is situational, context-dependent, and embodied and is influenced by emotional, behavioral, social, and cultural factors, which promotes the study of the interaction between the physiological basis of an individual's processing and interpersonal socio-cultural phenomena (Ibáñez, Sedeño & García, 2017) Some scholars have also explained the necessity of integrating the experimental and situational paradigms in the study of the translation process (Lu & Zheng, 2022).

So far, there are also some social neurocognitive studies combined with language research (Hansen, McMahon & de Zubicaray, 2019); the development of social neuroscience provides the possibility of "translation context neurocognitive research.". O'Brien (2017) argues that although current machine translation technology is far from being able to present the cognitive level of how translators operate, it is possible to explore the ways in which translators interact with machine translation through the study of the cognitive processes of translation. Translators are able to readjust their own translation processes in the context of computer-assisted tools, automate parts of their work, and adapt their translation decision-making processes to new work environments (Carl, 2020).

3.4 Teaching Intelligent Translation

Research on intelligent translation teaching in the age of artificial intelligence includes research on the theory of intelligent translation teaching, research on translation ability, and research on translation education technology.

Intelligent translation education is a new type of translation education paradigm formed by organically integrating translation education with intelligent technology and scientific education concepts. By creating an intelligent translation teaching environment based on the situation and development trend of human-computer interaction, human-computer cooperation and human-computer symbiosis and applying data-driven evaluation and analysis methods, it can help teachers and learners to flexibly and efficiently carry out teaching and learning activities so as to realize both the efficiency and quality of translation teaching. The data-driven evaluation and analysis methods are used to help teachers and learners carry out teaching and learning activities flexibly and efficiently so as to realize the double improvement of the efficiency and quality of translation teaching (WANG & Liu, 2023). In the implementation stage of translation teaching, intelligent learning analysis technology and ChatGPT-like technology can help the independent training of translation, serve as the learning companion of learners, and provide learners with Q&A services around the clock to solve general problems in the process of translation practice. In interpreting teaching and practice, the integration of voice recognition, machine interpreting and other intelligent technologies and tools will help the role of interpreting practice in a wide range of fields such as community, court, international medical care, international rescue and so on (WANG & LI, 2019), and revolutionize the mode of interpreting training and practice. For the evaluation of translation teaching, ChatGPT can also be used to initially assess the quality of learners' translations based on existing translation quality assessment models or indicators (such as DQF, MQM, BLEU, etc.), and the teacher, combined with the feedback results of AI, conducts manual analysis and professional evaluation to summarize the common problems and provide targeted guidance suggestions for learners.

Translation competence is the sum of a series of knowledge, skills and strategies needed to accomplish translation (Miao, 2007; Qian, 2011). The study of translation competence in the era of artificial intelligence can more accurately grasp the new demand and new orientation of the translator's translation competence cultivation in the new era. The concept of translation competence originates from the linguistic framework of "bilingual competence". The theory of "natural translation" advocates that translation can be accomplished by possessing the conversion ability at the language level (Harris B & Sherwood, 1978). However, with the deepening of translation research, the perspective of translation competence research emphasizes the consideration of social and cultural factors (XU, 2002; Toury, 2012), and intercultural communication ability also plays an important role in translation activities (Colina, 2003). Since then, with the arrival of the era of artificial intelligence, the ability of translators to complete translation tasks with the help of tools and technologies has been further emphasized (Pym, 2004); Liang and Liu (2023) found that the advantages of translation ability of human intelligence are mainly reflected in three aspects: the advantage of bilingual conversion ability, the advantage of communicative ability, and the advantage of linguistic ability so that the ability of translators to complete high-quality human translations and collaborative translation between humans and machines can be improved through more targeted translation teaching. The ability of translators to accomplish high-quality human translation and human-machine cooperative translation can be improved through more targeted translation teaching (Liang & Liu, 2023).

The study of translation education technology in the era of artificial intelligence refers to the theory and practice of designing, developing, using, managing and evaluating the process of teaching and learning translation and related resources, covering all the technological means and methods adopted in translation education activities, aiming at optimizing the teaching of translation education (ZHANG & LYU, 2023). Academics should draw on the interdisciplinary frontier achievements of AI, big data, the Internet of Things, brain-computer interface, etc., to fully release the great potential of digitalized and ubiquitous teaching mode and promote the transformation and upgrading of translation education informatization (WANG, 2021). Li et al. (LI et al., 2019) proposed to strengthen the research on key technologies such as data fusion and realize the integration and sharing of multi-source, multi-modal, semantically heterogeneous education big data such as behavioral data, physiological data, psychological data, cognitive data, emotional data, and so on. According to Wang (2021), it is necessary to strengthen the research and development of translation education technology products, integrate big data technologies such as learner analysis, education data mining, education data visualization, teaching-learning interaction analysis and learning prediction, and build a multimodal, interactive and intelligent translation teaching and learning platform; through deep learning, mine and analyze the intrinsic correlation between students' translator portraits and behaviors, and provide personalized learning content and tests by the learning system to achieve effective learning interventions. The learning system automatically provides personalized learning content and tests to realize effective learning interventions.

4. Significance of translation research in the view of artificial intelligence

Translation research under the perspective of artificial intelligence is essentially the fusion of artificial intelligence technology and translation research. This integration not only expands the perspective of translation research but also revolutionizes the method of translation research and enriches the connotation of translation research.

4.1 Expanding the perspective of translation studies

With the introduction of artificial intelligence's text deep mining technology, intelligent analysis, deep learning, neural network machine translation and other technologies into translation research, translation research observes and analyzes the phenomenon of translation based on artificial intelligence technology, realizing the shift from a linguistic perspective to an interdisciplinary perspective integrating the philological perspective, linguistic perspective, socio-cultural perspective, and cognitive psychological perspective. The phenomenon of the integration of neurocognition and situational cognition and the intermingling of cognitive research and artificial intelligence has appeared in translation research. For a long time, translation research has been dominated by linguistic feature research. So far, the academic community has not yet formed an objective and comprehensive understanding of the linguistic features of translation, especially the study of translation commonality. However, translation research under the perspective of artificial intelligence has made the multi-level depiction of translation language features possible, and the philological perspective, socio-cultural perspective, and psychological-cognitive perspective of translation research have also gained the technological support of artificial intelligence, so translation research has seen the combination of process-oriented and product-oriented depiction and interpretation of translation facts.

4.2 Renewing the methodology of translation studies

For a long time, translation research has been dominated by qualitative research, and in recent years, quantitative research on translation has also appeared. The translation research under the perspective of artificial intelligence, on the other hand, in terms of theory, can rely on the method of computational neuroscience to construct a model of linguistic information processing in the brain and a model of the human language processing mechanism, and then use interdisciplinary research methods to construct a neurocognitive computational model of the translation cognitive processing process in order to characterize, interpret and predict the translation cognitive behaviors, and at the same time, it can incorporate the examination of macroscopic factors, such as culture and history, as well as personal experience, At the same time, it can incorporate the examination of macro factors such as culture and history and micro factors such as emotion and personality to construct a more explanatory and predictive model of translation cognitive processing. Translation research under the perspective of artificial intelligence can also increase the empirical basis of translation research so that the description of translation products or translation facts and the explanation of the nature of translation or the law of bilingual conversion can be based on the observation and statistics of a large number of bilingual corpus under the background of a large number of artificial intelligence technologies. More crucially, the application of AI technology makes the presentation of data and their interrelationships of translation products or translation processes more vivid and intuitive. The application of neural network machine translation technology and text data mining technology can also help researchers discover translation phenomena or translation facts that cannot be observed in manual translation products and translation processes.

5. Conclusion

This paper comprehensively describes the origin of translation research from the perspective of artificial intelligence and analyzes its essence, characteristics, main research areas and significance. Our study synthesises translation research from the perspective of artificial intelligence, which begins with the fusion of artificial intelligence research and translation research and is characterized by intelligence, situationality and integration. However, we don't take into consideration cultural and emotional factors in translation studies. Future research can enrich the study from a social-cultural perspective. This study summarizes, in a general sense, a new research perspective concerning translation studies. Further studies are needed to investigate how new technologies could enforce translation research.

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