

THE ADVANTAGES AND DISADVANTAGES OF MACHINE TRANSLATION

Karimova Madinaxon

Student of USWLU.

Supervisor Inamova Dilfuza

Annotation: *This article examines the role of artificial intelligence (AI) in translation and analyzes the challenges associated with machine translation. It describes the evolution of translation technologies, the current state of AI, and its advantages, including accessibility and speed. It also emphasizes significant challenges, including context errors, difficulties in translating idioms and cultural expressions, and the need for human supervision. Finally, it analyzes the future prospects of AI and its role in supporting professional translators.*

This article provides an overview of the current state of the art and future possibilities of AI in translation, emphasizing the importance of striking a balance between technology and human intervention in order to achieve optimal results.

Keywords: *Artificial intelligence (AI), machine translation, neural networks, automated translation, translation accuracy, idiom translation, cultural differences, human quality control, ethical issues, algorithm bias, AI perspectives, translator support, translation technologies, translation accessibility.*

Significant changes have occurred in translation technologies since the beginning of the 20th century. In the early stages of development, translations were conducted manually, which necessitated a considerable investment of time and effort. In the 1950s, the inaugural experiments with machine translation commenced, yet the outcomes were deemed inadequate due to the constraints of the algorithms and dictionaries employed. The advancement of computers and software has led to the development of increasingly sophisticated machine translation systems.

The concept of artificial intelligence (AI) and its impact on the field of modern translation.

The advent of artificial intelligence (AI) has brought about a revolutionary transformation in the domain of machine translation. Contemporary translation systems, including Google Translate and DeepL, employ neural networks to enhance the precision and quality of their output. The incorporation of AI enables the consideration of contextual and syntactic elements, thereby enhancing the naturalness and accuracy of the resulting translations. In recent years, there has been a notable advancement in the field of spoken language translation, with the advent of systems such as the ATR project in Japan. These systems are being developed for use in international conferences and hotel reservations. Dialog systems have also witnessed significant progress, with the integration of human and machine collaboration in the generation of translated text. An area of particular interest is the incorporation of AI into workstations for translators, which has the potential to enhance the efficiency and quality of translations.

Historical overview of machine translation:

- The advancement of translation technologies

In the early 20th century, translations were conducted manually, which was a labor-intensive and time-consuming process. The concept of machine translation of natural languages was first proposed in the 20th century, with the filing of patents for the first such systems by Georges Artsruni and Peter Smirnov-Trojansky in 1933. The first public demonstration of a machine translation system was held in 1954 at Georgetown University, where a sample of 49 Russian sentences was translated into English.

The evolution of translation technologies has progressed from the initial "direct" machine translation systems to more sophisticated approaches. The initial type of MT system was "direct translation," whereby the system was developed for a specific pair of languages and the translation was conducted directly from the source language (SL) to the target language (TL). The second approach, interlingua, entailed converting source texts into interlingual representations that would generate translations into other languages. The third, less ambitious transfer approach employed three steps: converting source texts into abstract representations, converting these representations into the target language, and generating final texts.

With the advent of computers and AI, more sophisticated machine translation systems have emerged, including Google Translate and Deepl, which employ neural networks to enhance the precision of their translations. These systems analyze vast quantities of text and consider contextual factors, enabling them to produce more accurate and natural translations.

- The period between 1967 and 1976 is referred to as the "Quiet Decade."

In the United States, the majority of machine translation activity was focused on the translation of Russian scientific and technical materials into English. Conversely, in Canada and Europe, the requirements were distinct, resulting in a notable surge in interest in machine translation. In Montreal, research commenced in 1970 on a syntactic translation system for English-to-French translation. This was part of the TAUM project.

- New areas of research in the 1990s

In the 1990s, machine translation research expanded significantly to encompass new areas, including the production of high-quality texts in target languages and spoken language translation. The advent of example-based methods has prompted greater focus on the generation of high-quality texts. Since 1990, numerous research groups have explored the use of "dialog MT systems," which involve the collaborative generation of translated text between human and machine.

One of the most significant developments in recent years has been the increased interest in spoken language translation. The Japanese ATR Interpreting Telecommunications Research Laboratories project is developing a system for telephone registration at international conferences and hotel reservations.

The role of artificial intelligence (AI) in contemporary translation practices:

The advent of modern AI technologies has markedly transformed the methodology employed in the field of translation. The most well-known and popular tools in-

clude Google Translate and DeepL. Google Translate employs neural networks to facilitate translations between multiple language pairs, offering highly accurate and expedient results. DeepL is renowned for its capacity to generate translations that closely resemble those of a human translator through the utilization of deep learning. Additionally, Microsoft Translator, which provides access to a vast array of language pairs and integration with numerous Microsoft applications, and Amazon Translate, which prioritizes business applications, are noteworthy.

Artificial intelligence (AI) enhances the precision and velocity of translations through a number of pivotal elements. The use of neural networks and deep learning algorithms enables systems to consider context, thereby facilitating more accurate translations, particularly in the case of complex sentences. AI systems are trained on vast quantities of data, allowing them to enhance their algorithms and produce translations that are more natural in style. AI also permits real-time translations, which makes the process much faster and available for use in a variety of fields, including business and communications. AI algorithms are continually being updated and improved, ensuring high-quality translations over time.

- The business sector

eBay: The company is employing AI to translate product descriptions, thereby facilitating communication between sellers and buyers in their native languages and consequently boosting international sales.

General Motors: The company utilizes Systran to translate technical documentation and service manuals, thus enabling faster and more accurate delivery of information to dealers and service centers around the globe.

- Medicine

The use of artificial intelligence (AI) has become increasingly prevalent. AI is employed in the translation of medical reports and case histories, facilitating access to crucial medical information for medical professionals and patients who speak different languages. The Mayo Clinic employs artificial intelligence (AI) to translate medical reports and case histories, facilitating access to crucial medical data for physicians and patients who speak disparate languages. Similarly, ClinicalTrials.gov utilizes AI to translate clinical trial descriptions, ensuring that international participants and researchers can access pertinent information.

AI is being employed to facilitate cross-cultural communication and enhance accessibility to educational resources. Coursera, an online education platform, employs AI to translate learning materials, thereby making its courses accessible to students across the globe. Similarly, EdX utilizes AI to translate video lectures and course materials, enabling students from disparate countries to enroll in the same course irrespective of their native language.

The field of tourism has also benefited from the advent of AI. For example, Google Translate has been used to translate menus, road signs, and other important inscriptions in real time using a smartphone camera, thereby assisting travelers in navigating foreign countries.

TripAdvisor employs AI to translate reviews and recommendations, thereby assisting travelers in planning their trips and navigating foreign countries. Google

Translate is a mobile application that enables travelers to translate menus, road signs, and other important inscriptions in real time using their smartphone's camera.

AI is employed in a variety of ways, including the translation of legal documents and the analysis of court decisions. This allows lawyers and attorneys to access and analyze relevant information more efficiently.

Thomson Reuters employs AI to facilitate the translation of legal documents and court decisions, enabling lawyers and attorneys to identify and analyze pertinent information in a more expedient manner. TransPerfect offers AI-powered legal text translation services that expedite the process and enhance the accuracy of translations required for court cases.

The advantages of AI-based machine translation:

The use of AI in machine translation has the potential to make translations accessible to a much wider audience than was previously possible. Tools such as Google Translate and DeepL allow users to instantly translate texts into different languages, which can be particularly beneficial for students and travelers who may otherwise struggle to understand foreign texts or road signs. By simply pointing their phone's camera at the relevant text or sign, users can obtain an instant translation, which greatly simplifies everyday communications and improves access to information.

- The acceleration of the translation process

The use of AI has significantly accelerated the translation process. In the past, it was necessary to dedicate days or weeks to the translation of documents; however, modern AI systems can now complete this task in minutes. For instance, General Motors employs Systran to translate technical documentation and service manuals, thereby enabling the company to disseminate information more rapidly to its dealers and service centers across the globe. In the field of information technology, companies such as Microsoft are leveraging AI to translate software and documentation, which has resulted in the expedited launch of products in international markets.

- The capacity for real-time automated translation

A notable advancement is the capacity to automate real-time translation, which is particularly advantageous in international negotiations and conferences. For instance, the ATR Interpreting Telecommunications Research Laboratories project in Japan is developing a system for telephone registrations for international conferences and hotel reservations. Systems such as Google Translate and Microsoft Translator also offer real-time translation functions, enabling individuals to communicate freely in different languages without delay.

Context and Language Nuance Errors:

One of the most significant challenges in machine translation is the inability of AI to accurately interpret context, particularly in complex sentences or texts that contain polysemous words.

•To illustrate the practical application of this concept, we may consider the following examples:

The word "crane":

Context: "The crane lifted the heavy container."

Possible translations into Russian: *"Кран поднял тяжелый контейнер."* or *"Журавль поднял тяжелый контейнер."*

Error: In this context, "crane" refers to a construction crane, but a machine translation system might interpret it as "журавль" (a bird), leading to confusion.

The phrase "set the table":

Context: "Please set the table for dinner."

Possible translations into Russian: *"Пожалуйста, накройте на стол для ужина."* or *"Пожалуйста, установите стол для ужина."*

Error: The phrase "set the table" in English means "накрыть на стол" in Russian (to prepare the table for a meal), but a machine translation might literally translate it as "установите стол" (to place or set up the table), which changes the intended meaning and causes confusion.

- Problems with translating idiomatic expressions and cultural references

Translating idiomatic expressions and references from one language to another poses a significant challenge for AI systems. Idiomatic expressions often contain hidden or figurative meanings that can be difficult to capture without a comprehensive understanding of the cultural context.

For instance, the English expression "kick the bucket," which means "to die," cannot be directly translated into another language without losing its figurative significance. Instead, it must be rendered in a way that conveys the same meaning, such as "to pass away".

Another example is the Japanese saying "猿も木かかる (sarukakaru)." This phrase translates literally as "even monkeys fall from trees." It is used to indicate that even experienced people can make mistakes, but the literal translation does not fully convey this meaning. In order to properly understand the saying in its cultural context, an explanation is required.

- The importance of human review

Given the limitations of machine translation as discussed above, it is essential to have human review of translations. Professional translators are able to correct errors and ensure accuracy. For instance, eBay utilizes AI to translate product descriptions but also relies on human reviewers to review and edit translations prior to publication.

Artificial intelligence (AI) has had a significant impact on the translation industry, enhancing the precision and speed of translation processes and making translated content more accessible to a wider audience. Advanced AI technologies, including neural networks and deep learning algorithms, enable systems to better understand context and account for cultural differences, resulting in more accurate and natural-sounding translations.

Despite these advances, AI still encounters challenges when translating idiomatic expressions, cultural references, and words with multiple meanings, underscoring the need for human oversight and intervention to maintain translation quality.

Considering the future of artificial intelligence (AI) in the field of translation, it is likely that there will be further advancements and integrations with various technologies. The integration of AI into educational platforms and augmented reality

(AR) devices has the potential to make learning and communication processes more accessible and efficient.

AI will continue to support professional translators by assisting them with tasks such as checking for errors, providing suggestions for synonyms, and translating complex phrases. This will allow translators to focus on nuanced and detailed aspects of the text, enhancing the quality of their work.

The future of AI-assisted translation holds great promise, with the potential to significantly improve the accuracy and quality of translations, thereby facilitating communication between individuals from different linguistic and cultural backgrounds. This, in turn, can contribute to a better understanding and appreciation of diverse cultures, leading to increased global cooperation and collaboration.

References:

1. <https://aymara.org/biblio/mtranslation.pdf>
2. <https://muegge.cc.cutestat.com/>
3. <file:///C:/Users/user/Downloads/EquivalenceChallengesinMachineTranslationAnAnalysisofGoogleTranslateOutputthroughMonaBakersTheory2011andPost-EditingStrategies.pdf>
4. <https://simplelocalize.io/blog/posts/ai-translations/>
5. <https://murf.ai/resources/ai-translation/>
6. <https://www.digitalocean.com/resources/articles/ai-translation-tools>
7. <https://lingvanex.com/blog/translation-and-artificial-intelligence/>