LINGUISTIC CHALLENGES OF ARTIFICIAL INTELLIGENCE-BASED TRANSLATION

Narzullayeva Feruza Husniddinovna
University of Science and technology
2nd year student

Abstract. This article analyzes linguistic problems encountered in the process of translation based on artificial intelligence, including semantic ambiguity, phraseological units, context awareness, and cultural features. It also highlights the capabilities of translation systems based on neural networks and their effectiveness in processing language units. The article also discusses the importance of the human factor in the process of automatic translation and the prospects for the development of modern translation technologies. The results of the study show that linguistic analysis is important for improving the quality of translation using artificial intelligence.

Keywords: Artificial intelligence, automatic translation, linguistic problem, semantics, context, neural translation, phraseology, language technology, machine translation, communication.

In today's globalization process, the volume 15of information exchange and communication between different nations is expanding. Translation activity is one of the important tools in this process. In recent years, as a result of the rapid development of information technologies, automatic translation systems based on artificial intelligence have become widely used. Google Translate, DeepL and other neural translation platforms create the possibility of translating large volumes of texts in a short time. This creates convenience in science, education, business and international relations.

Nevertheless, translation systems based on artificial intelligence cannot perfectly reflect all the linguistic features of the language. In particular, various problems arise in the process of translating semantic ambiguity, incomplete

understanding of the context, phraseological units, metaphors and national-cultural units. Language consists not only of grammatical rules, but also embodies the culture, thinking and mentality of the people. Therefore, the correct interpretation of some phrases or word combinations by automatic systems is difficult[1].

Modern translation programs based on neural networks analyze language units using a large database and develop possible translation options. However, such systems in some cases cannot adequately express the stylistic features, emotional coloring or hidden meanings of the text. As a result, the quality of the translation decreases or the content is misinterpreted. The human factor is especially important when translating literary texts, scientific terminology and multi-meaning units. This article analyzes the main linguistic problems encountered in the process of translation based on artificial intelligence. It also discusses the capabilities of automatic translation systems, their advantages and disadvantages, and ways to improve the quality of translation. The study sheds light on the relationship between linguistics and modern technologies from a scientific perspective.

Artificial intelligence-based translation technologies are one of the most important innovative directions of the 21st century. In a modern society where information exchange is accelerating, the need for effective organization of communication between different languages is increasing. Therefore, machine translation systems have become the focus of scientific research. In particular, translation systems based on neural networks significantly improve the quality of translation. However, due to the complex nature of language, many linguistic problems arise in the process of translation using artificial intelligence. These problems are closely related to semantic, syntactic, pragmatic and cultural factors[4].

Language is a product of human thought, reflecting the history, culture and worldview of the people. Artificial intelligence systems process language units mainly on the basis of mathematical models and statistical probabilities. As a result, in some cases, the content of the text may be misinterpreted or the meaning may be

lost in translation. In particular, words with multiple meanings are a difficult problem for automatic translation systems. For example, the English word “bank” can be used to mean a financial institution or a riverbank. If artificial intelligence does not fully understand the context, it is likely to choose the wrong translation option.

Semantic problems are one of the main difficulties in machine translation. The meaning of words often depends on the context. A human translator selects the appropriate option based on a general understanding of the content of the text, while artificial intelligence performs a probable translation based on a large database. This sometimes leads to grammatically correct but semantically incorrect translations. In particular, artificial intelligence is limited in translating metaphors, irony, and symbolic expressions in fiction.

Phraseological units are also one of the complex issues for automatic translation systems. Each vernacular has its own idioms and proverbs, and translating them word for word would distort the meaning. For example, the English phrase “break the ice” does not mean “to break the ice”, but rather “to start a conversation”. If an artificial intelligence system cannot determine the literal meaning of this phrase, the quality of the translation will decrease. Therefore, contextual and cultural analysis is important for the correct translation of phraseological units[1].

Syntactic issues also play an important role in machine translation. Sentence structure and grammatical order differ in different languages. For example, while word order in English is strict, in Uzbek the arrangement of words is relatively free. Although artificial intelligence systems can sometimes translate according to grammatical rules, they cannot preserve the natural tone of the sentence. As a result, the translation will look artificial or incomprehensible.

In addition, the translation of tenses and grammatical categories is also a complex issue. Grammatical units that exist in some languages do not exist in other languages. For example, the Perfect tense in English does not have a complete

equivalent in Uzbek. Since artificial intelligence systems cannot fully understand such grammatical differences, ambiguity of meaning arises. Pragmatic problems are also important in the translation process. Pragmatics studies the use of language units in speech situations. The same sentence can have different meanings in different situations. A human translator translates, understanding the communicative purpose of the text, while artificial intelligence does not always fully understand such subtleties. This problem is especially noticeable when translating humor, sarcasm, or emotional expressions.

The issue of translating cultural units is also relevant. The national values, customs and historical concepts of each nation are expressed through language. For example, it is difficult to find an alternative option when translating some national dishes, clothes or traditions into another language. Artificial intelligence systems often translate such units through transliteration or incorrect interpretation. This negatively affects the cultural content of the text.

Neural translation systems are considered to be more advanced than previous statistical translation systems. They analyze the text using artificial neural networks and determine the relationship between language units. Such systems are trained on the basis of large corpus data. As a result, the quality of translation increases significantly. However, neural translation systems also make mistakes in some cases. Especially for rarely used languages, if the database is insufficient, the quality of translation decreases[2].

There are also problems with machine translation in Uzbek. The agglutinative nature of the Uzbek language, that is, the abundance of suffixes, complicates the automatic analysis process. One word can express several grammatical meanings. This makes morphological analysis difficult for artificial intelligence systems. In addition, synonyms and stylistic differences in the Uzbek language also affect the quality of translation.

Machine translation systems give relatively effective results in translating scientific and technical texts. Because in such texts the terminology is used in a

clear and standard form. In literary texts, the capabilities of artificial intelligence are limited due to the large number of emotional-expressive means. For example, preserving rhyme, rhythm and imagery in the translation of poetic texts is a very difficult task.

Linguistic research must be strengthened to develop translation systems based on artificial intelligence. Enriching language corpora, creating phraseological dictionaries and improving semantic analysis algorithms will serve to increase the quality of translation. Hybrid translation systems operating on the basis of human and artificial intelligence cooperation can also give effective results. In such systems, the initial translation is performed by a machine, and then edited by a human translator[3].

Nowadays, translation technologies based on artificial intelligence are becoming an important tool in the development of international communication. They make it possible to learn foreign languages, use scientific data, and facilitate global information exchange. At the same time, in-depth study of linguistic problems and their elimination further increases the efficiency of modern translation technologies.

Thus, despite the great potential of the translation process based on artificial intelligence, it is associated with various linguistic problems due to the complex and multi-layered nature of language. To solve these problems, it is important to develop integration between the fields of linguistics, computational linguistics, and artificial intelligence.

The process of translation based on artificial intelligence is one of the most discussed areas in the field of linguistics and computational linguistics today. Although these technologies, in particular neural machine translation systems, have significantly improved the quality of translation, they still pose a number of problems from a linguistic point of view. These problems are mainly related to uncertainties at the semantic, pragmatic and stylistic levels.

is the problem of full understanding of the context. Although artificial intelligence systems are highly effective in identifying statistical relationships between words and sentences, they cannot always correctly interpret hidden meanings, irony or cultural references in real speech. This reduces the naturalness of the translation result and in some cases leads to a change in the content.

There are also significant difficulties in the translation of idiomatic units and phraseologisms. For example, a stable expression in one language can produce a completely incorrect or incomprehensible meaning when translated word for word into another language. This situation indicates the need to further enrich the linguistic knowledge base of artificial intelligence systems.

The role of the human factor in the translation process. Experienced translators analyze the text not only from a linguistic point of view, but also on the basis of the cultural and communicative context. Artificial intelligence, however, cannot fully implement this level of deep interpretation. Therefore, post-editing, that is, the process of editing by a person, remains an important stage in ensuring the quality of translation.

It should be noted that cooperation between artificial intelligence and a human translator is considered the most optimal solution. This approach not only increases the speed, but also the linguistic accuracy of the translation. In the future, it is expected that some of these problems will be eliminated with the emergence of more advanced models.

Artificial intelligence-based translation is becoming one of the most important areas of global communication today. Translation systems based on digital technologies and neural networks are creating great opportunities for reducing language barriers, accelerating information exchange, and facilitating international communication. However, along with this process, a number of linguistic problems are also emerging. These problems directly affect the quality of translation, the accuracy of content, and the naturalness of the text.

Research shows that artificial intelligence systems, in particular neural machine translation (NMT), can produce grammatically correct but not completely semantically accurate results. This is often evident in the translation of polysemy, idiomatic units, phraseologisms, and units related to cultural context. For example, the fact that a word has multiple meanings or changes depending on the context creates difficulties for artificial intelligence.

Also, the pragmatic meaning, that is, the hidden purpose and emotional coloring of the speech, may not be fully preserved during the translation process. This leads to the fact that the text does not sound as natural as if it were written by a person. This problem is especially noticeable in literary texts, advertising materials and social discourse. Since artificial intelligence is based on a more statistical and algorithmic approach, it cannot fully capture the subtle layers of meaning in human thinking.

In addition, the richness and quality of the database also have a great impact on the quality of the translation. If the system is not trained sufficiently, it can produce incorrect or inaccurate translations. Therefore, the expansion of linguistic resources and the enrichment of corpora between different languages is an urgent task.

At the same time, translation systems based on artificial intelligence cannot completely replace the human translator, but rather serve as an auxiliary tool for him. The most effective result is achieved in the cooperation of man and machine, that is, through the post-editing process. This approach is important in improving translation quality and reducing linguistic errors. In conclusion, although artificial intelligence has significantly improved the translation process, its linguistic problems have not yet been completely eliminated. In the future, it will be possible to create more accurate and natural translation systems by conducting in-depth scientific research in this area, further improving artificial intelligence algorithms, and integrating linguistic theories.

References

1. Tursunov U., Rahimov S. Zamonaviy tilshunoslik asoslari. Toshkent: O‘zbekiston Milliy Universiteti nashriyoti, 2018.
2. Sodiqov A. Tilshunoslik va tarjima nazariyasi. Toshkent: Fan, 2015. b.
3. Nida E. A. Toward a Science of Translating. Leiden: Brill, 2004. 4.Makhmudov K. O‘zbek tilida tarjima muammolari. Toshkent: Sharq, 2019.