



Evolution of Machine Translation and Simultaneous Interpretation

¹Reem Rostom, ²Mekhala Venkatesh

¹ PhD Research Scholar, Postgraduate Department of English, School of Humanities and Social Sciences, Jain Deemed-to-be-University, Bengaluru

² Associate Professor & Research Guide, Department of English, Jain (Deemed-to-be) University, Bengaluru
Email – ¹ reem.rostom@gmail.com , ² mekhalavenkat@gmail.com

Abstract: *The world of language services is going through a tremendous transition in the quickly evolving technology environment of today. This study examines the growing debate among linguists and researchers who contend that machine translation (MT) and machine simultaneous interpretation (MSI) could soon pose a serious threat to human interpreters. Programmers and linguists are leading the way in redefining the interpretation environment, which is being driven by a focused effort to investigate the subtle linguistic components of languages. The primary causes promoting machine translation and simultaneous interpretation towards potential competition with human translation and simultaneous interpretation are examined in this study as the distinctions separating human and machine competencies become increasingly blurred. This study explores the critical role that linguistic analysis, computational methods, and artificial intelligence play in equipping machines to successfully negotiate linguistic difficulties. By examining the emerging technologies and methodologies underpinning the rise of machine translation and interpretation, we gain insights into the opportunities and constraints shaping the future of translation services. This paper offers a comprehensive exploration of the evolving relationship between humans and machines in the domain of translation, providing a deeper understanding of the dynamic intersection between human expertise and technological innovation in the realm of language translation and interpretation.*

Key Words: *human translation and simultaneous interpretation, machine translation and interpretation, technological innovation, language.*

1. INTRODUCTION:

International and interethnic communication can be accomplished on a basic level through translation, both written and spoken. Even for experienced translators, oral translation—especially simultaneous interpretation—presents a significant difficulty because it calls for training, experience, as well as linguistic and extralinguistic knowledge of both the source language (SL) and the target language (TL). It also calls for the ability to provide accurate translation quickly and synchronously by listening, understanding, retrieving, reformulating, and reproducing the source text. The simultaneous interpreter's job is extremely challenging because of these mental and physical processes, as well as the intense time constraints placed on them. A few decades ago, human translation was the only means of communication. However, machine translation emerged and is continuously improving. In the realm of translation and interpretation, there is a lot of curiosity these days concerning the prospect of replacing humans with machines. Machine translation technology providers include companies with names like Interactio, Interprefy, Kudo, Olyusei, Wordly, and others. Because they enable participants and attendees to receive translations in nearly any language they desire, these systems are employed as remote simultaneous interpretation systems. Another kind of computer translation has surfaced, posing a threat to human interpretation. This sort of language access is referred to as machine simultaneous interpretation (hereafter MSI) and offers real-time on-demand language access.



2. TRANSLATION:

Over time, the idea of translation has evolved. Word-to-word correspondence, form and content were its primary concerns before it shifted from scrutinising the text to concentrating on the extra-textual components. As a result, it has been defined differently over time.

The process of translating written texts from one language to another was initially described as a "craft" by Newmark (1981). According to Youssuf (2006, p.23), translation is "the attempt to replace a textual material in the Source Language (SL) by an equivalent textual material in the Target Language (TL)".

Nida (1991) asserts that a variety of variables, including language components, the author's intent, cultural distinctions, communication problems, content variations, and the context in which the translation is employed, may influence translation and give rise to various ideas and views. The philological perspective, linguistic perspective, communicative perspective, and sociosemiotic perspective are the fundamental four views of translations that he underlines. According to him, people typically interpret utterances based on these four perspectives. He prefers not to refer to these perspectives "theories of translation" because, in his opinion, all that has been accomplished thus far is an important series of insightful perspectives on this complex undertaking (p.20).

3. SIMULTANEOUS INTERPRETATION:

The earliest instance of simultaneous interpreting was telephonic interpreting in the 1920s. In 1945, it started to be televised. Later, it began to be utilised in conferences, though primarily consecutively rather than simultaneously. Simultaneous interpretation, particularly in meetings with more than two languages, emerged fifty years after that. Some interpreters initially opposed simultaneous interpreting because they thought it was of lower quality than consecutive interpreting (Seeber, 2015).

Numerous linguistic and non-linguistic elements influence interpreting. Simultaneous conference interpreting is regarded as an interlingual communication process since it establishes an interaction between the speaker and the listener through the interpreter. As attention has shifted to emphasise the sociological, ethical, and political dimensions of interpreting in various contexts, research in this subject used to focus on the linguistic characteristics of speech among simultaneous interpreters. Today's research focuses on topics including identity, ethics, remote interpreting advancements, and technology. (Baker & Diriker, 2020).

SI demands a diverse set of skills. It is a challenging and complex task in which the interpreter must concurrently listen, understand, reformulate, translate, and produce language, or do numerous activities. As mentioned earlier, the source text creator speaks as the interpreter in SI improvises the oral translation. According to Riccardi (2005), due to the concurrent activation of numerous cognitive processes, SI is a skill, implicit competence, and procedural knowledge whose components and processes are interconnected. Every term the interpreter uses is the result of knowledge that has been reorganised to fit SI situations and circumstances, he continues.

4. MACHINE TRANSLATION:

Every day, new technologies and applications are introduced that facilitate collaboration at all levels. One of these communication technologies is machine translation, which is frequently utilised in industries like social media, travel, language learning, businesses, and conferences. Every branch of technology is advancing quickly, making it far simpler to execute any task than it was when it was mostly done by humans. Since its introduction in the 1950s, MT has developed to the point where it resembles human translation in certain ways.

On the list of technology providers in the machine translation industry are companies with names like Interactio, Interprefy, Kudo, Olyusei, and others. Because they enable users to receive translations in almost any language, these systems are often known as remote simultaneous interpreting systems. Machine simultaneous interpreting (MSI), a new type of machine translation that threatens human interpretation, has lately come into existence.

5. THE DEVELOPMENT OF MACHINE TRANSLATION:

In the 1930s, the idea of MT was originally established, but society did not favour it. It was first used for military functions. In the 1950s, conferences and research on machine translation were held. MTs were inaccurate, risky, and expensive word-for-word translations. In the 1980s, MT was cheaper and was largely human-aided to support human translation. Later in the 1990s, online MT services started to appear, and many software programmes included applications for MT. Even yet, it needed post-editing and had low quality, which made it less reliable. (Sreelekha S. et al., 2016 & Akbari A., 2014).



The human translator should serve as a post-editor while machine translation serves as a translation helper. This means that a machine-translated text is double-checked, proofread, and revised by the translator rather than being translated from scratch. Such collaboration has the important advantage of increasing the translator's output. Undoubtedly, this type of "machine and human" combination cannot be used with all text kinds, but it excels with more formal, structured, and regular documents, such as contracts, yearly financial statements, software records, and product instruction manuals, and the like.

Therefore, it seems that concerns about human translators becoming replaced by machines in a few years are unfounded. However, it seems that the role of the translator will definitely change in the future. As machine translations get more sophisticated, human translators may no longer be genuine translators instead serving as "editors," revising texts that machines have already translated. (Puchala-Ladzinska, 2016).

Hutchins (2003) claims that the interest in using computers in the translation industry has increased for several reasons, including the sheer volume of materials that require to be translated, the challenge of dealing with technical terms, and the requirement to maintain equivalent translations of the same terms. Computers are thought to be better at performing this than people, who prefer to adjust their translations, which is bad for technical translations. Another reason is that businesses desire to have their translations completed as quickly as achievable, and the adoption of computer-based translation tools can speed up and increase the volume of translation throughout. When a high-quality translation is not necessary, computers can produce adequate translations. The cost of machine translation is also lower than that of human translation. MT is occasionally preferable over human translation or interpretation for the reasons mentioned above.

Peng (2018) discusses the benefits and drawbacks of MT, claiming that it is the fastest type of translation currently available and can be completed in most cases in only a matter of seconds. This is because it is a literal translation that does not consider any additional time-consuming details. The best aspect for businesses with minimal resources is that machine translation is free. The most well-known of the many free machine translation programmes offered online is Google Translate. Even though machine translation is still not quite perfect, it is always becoming better. Neural machine translation is one of these innovations, which uses a sizable neural network to enhance translation quality. According to Peng, MT is effective with items that merely need to convey the main idea and are focused on quantity rather than quality.

Machines, on the other hand, are unable to differentiate between words that are significant and those that are not. The final translation may resemble a mechanical passage of text that appears to have been written by a person who is unfamiliar with the subject yet really makes sense in some way. Compared to professional human translation, which takes longer to complete, it saves time. Accuracy is another major problem, even particularly challenging because of the way sentences are put together and the various possible meanings of the terms. Machines fail to comprehend tones or situations.

Machine translation is frequently inaccurate when it comes to idioms, proverbs, tone, humour, culture, and other elements of speech because machine translation is typically literal. Collocations, idioms, and jargon expressions are being translated into machine dictionaries by linguists and computer scientists in the hope of making it better.

Online legal files and instructional guides, for instance, must be 100% accurate, and machine translation might be pricey. Here, errors could result in significant financial loss and long-term reputational damage for any business. As was previously mentioned, as technology develops, machine translations get better and better. What functions well in one language might not in another, though, as these are not fundamental advancements. As a result of using words from dictionaries and adhering to the conditional restrictions of the creator, machine translations are usually wrong.

According to Peng (2018), there are still plenty of obstacles for translators, and the human-machine interaction requires to be properly addressed. Human translators cannot entirely be replaced by automated or machine tools. They can now merely utilise MT and CAT (Computer Assisted Tools) as a reference, a rough drafting that needs to be polished.

Moreover, Akbari (2014) claims that MT has a variety of problems that occasionally make it unreliable.

a) Syntactical issues

It is challenging for machines to give accurate translations since each language has a distinct grammatical structure and uses pronouns differently. Translations occasionally may seem awkward since machines are unable to discriminate between and modify pronouns according to each language. Contextual ambiguity is another problem that MT faces.

b) Intertranslatability of Natural Language



“It should be noted that Machine Translation cannot render senses of the text in different situations. Machine Translation will not be able to contain indexical expression. Indexical expressions are expressions whose forms have characteristics which are only associated in nature with its meaning.” (p.6).

c) Slangs, linguistic ambiguity, and idioms

Every language contains some idioms that are challenging to understand or translate because of their hidden or embedded meanings and tones. Some of these are only understandable to native speakers.

d) Issues with Paralinguistics

The intended purpose of utterances is greatly influenced by paralinguistic features of speech, including voice tone, word stress, intensification, body language, and face gestures. Machines produce output that is unrelated to the intended meaning because they are unable to perceive and handle some characteristics (Akbari, 2014).

Alqudsi, Omar & Shaker (2012) claim that it is challenging to find a machine translation that corresponds to human needs. Machine translation could or might not be able to satisfy people's requirements when it comes to retrieval speed and accuracy of translation.

6. MACHINE SIMULTANEOUS INTERPRETATION:

Machine translation cannot easily take the place of human translation particularly when it involves context, intonation, homophones, polysemy, emotions, and other aspects. On the other hand, when it comes to simultaneous interpretation, machines create a challenge for people. "Simultaneous interpretation can be viewed as a set of three Efforts, namely the Listening and Analysis Effort, the Production Effort, and the Short-term Memory Effort," writes Gile (1995, p. 190). He continues by saying that comprehension becomes challenging while the interpreter is working since the source and target languages are competing for the interpreter's attention and interfering with each other.

According to Sefhoclé (2017), spoken words rather than written ones count in machine interpretation. Among the many factors that need to be taken into account in this task are accent, tone of voice, volume, and voice inflection. By considering into account these variables, the danger of errors or incorrect interpretations in machine interpretation that uses the statistical method could increase tremendously. Experts would also need to build on an ever-growing corpus of writings and talks, as well as previous translation and interpretation work, in order to attain the same degree of reliability as a human experienced translator or interpreter.

When analysing computer-produced interpreting and contrasting it with human interpreting, she continues, numerous factors must be considered, including register, cultural element, intonation, nonverbal expression, and context. In terms of human interpreting, preparation is essential. The translator can better navigate the project's context, culture, vocabulary, terminologies, register, and additional specifications with some preparation. Inasmuch as human simultaneous interpreters can translate a speaker's words as they are being said, substituting machine interpreters for human ones does not seem to save any time.

In his article, Fantinuoli (2018a) outlines two developments in SI technology. Simultaneous interpretation first became popular with the introduction of wired gadgets for speech communication. Early in the 1920s, the first attempts in this direction were noted. The second technological development that has affected interpretation is the Internet. The World Wide Web's emergence in the 1990s drastically altered how interpreters perceived and obtained knowledge.

Fantinuoli (2018b) predicts a third improvement as well as a new technological approach. He asserts that three essential areas—computer-assisted interpreting (CAI), remote interpreting (RI), and machine interpreting (MI)—will be crucial in this technological shift.

- In order to increase quality and - to a lesser extent - productivity, CAI is a sort of oral interpretation in which a human interpreter employs computer software to assist and facilitate certain areas of the interpreting task. By incorporating a variety of terminology resources, CAI tools are made to assist interpreters in the creation of glossaries.
- The term "Remote Interpreting" (RI) refers to a wide range of interpreter-mediated communication techniques. In addition to conference interpreting, searching up phrases or entities, and collecting crucial information from prepared papers, it has mostly been used to give remote consecutive interpreting products and services, such as in the medical or legal sectors. Testing on remote simultaneous interpreting, however, has found issues with audio/video signal quality, a partial absence of contextual information brought on by distance, and psychological factors like fatigue, higher stress levels, a decrease in motivation and attention, turn-taking, and tension, all of which have been shown to be crucial during the process of simultaneous interpretation.
- MI is a form of technology that enables a computer to interpret spoken words between different languages. Because it is intended to replace people, MI differs from the other major interpreting-related tools, CAI and RI,



in that they are intended to support human interpreters or alter the way in which their services are provided. The creation of MI systems is difficult for a few technological and communication reasons. The causes of inaccuracies and mistakes grow due to technological issues with automated translation quality, voice recognition delay, background noise tolerance, and presenter independence.

Horváth (2014) draws the conclusion that machine interpretation has less of an impact on the interpretation career than machine translation does on the translation profession because there are no independent subtasks for translation, such as post-editing or text preparation for translation. They are unlikely to continue functioning since spontaneous conversation is meant to be used immediately; if machines ever completely displace humans, there will probably no need for post-edited speeches.

Both technological development and efforts to create completely automatic machine interpretation systems will go on. We can predict that the interpretation market will be split into two segments depending on the influence of machine translation on the translation market: a lower-quality market where digital interpretation will be adequate and will be offered for a lower price or even free of charge; and a higher-quality market where competent human interpreters will be employed. While it might not be able to completely stop the spread of machine interpretation instruments it might be possible to guarantee that their market share is as small as it can be.

For a range of language pairings, Google and Microsoft have published various apps that provide automated interpretation with relatively real-time auditory and written output (Braun, 2019). Seligman et al. (2017) note various programmes are trying to build industry-specific technologies, such as some for military and social purposes as well as healthcare, even if these technologies have already entered the market. Many of these items were created using computerised phrase dictionaries that offered pre-translated phrases for particular fields. The ways these apps offer to solve well-known accuracy difficulties, including back-translations to let the user assess the accuracy of the translation, participative classification, or remedial feedback, represent a substantial breakthrough.

7. CONCLUSION :

To wrap up, machine simultaneous interpretation may soon be competitive with human simultaneous interpretation, according to certain researchers and linguists. To enable machines to offer correct translations in particular settings, programmers are focusing more on various aspects of languages, pragmatically, semantically, morphologically, syntactically, and phonologically speaking.

REFERENCES:

1. Akbari, A. (2014). An Overall Perspective of Machine Translation with Its Shortcomings. *International Journal of Education and Literacy Studies*, 2(1), 1- 10.
2. Alqudsi, A., Omar, N., & Shaker, K. (2014). Arabic machine translation: a survey. *Artificial Intelligence Review*, 42, 549-572.
3. Baker, M., & Diriker, E. (2019). Conference and simultaneous interpreting. In *Routledge encyclopedia of translation studies* (pp. 95-101). Routledge.
4. Braun, S. (2019). Technology and interpreting. In *The Routledge handbook of translation and technology* (pp. 271-288). Routledge.
5. Fantinuoli, C. (2018a). Computer-assisted interpreting: Challenges and future perspectives. *Trends in E-tools and resources for translators and interpreters*, 153-174.
6. Fantinuoli, C. (2018b). Interpreting and technology: The upcoming technological turn. In Claudio Fantinuoli (Ed.), *Interpreting and technology* (pp.1-12). Berlin: Language Science Press. DOI:10.5281/zenodo.1493289.
7. Gile, D. (2009). Basic concepts and models for interpreter and translator training. *Basic Concepts and Models for Interpreter and Translator Training*. John Benjamins.
8. Hutchins, J. (2003). Machine translation and computer-based translation tools: What's available and how it's used. *A new spectrum of translation studies*, 13-48.
9. Horváth, I. (2014). Machine interpretation. *Revue Internationale d'Études en Langues Modernes Appliquées*, 7(Suppl.), 19-26.
10. Newmark, P. (1981). *Approaches to translation (Language Teaching methodology series)* (p. 213). Pergamon Press.
11. Nida, E. A. (1991). Theories of translation. *TTR: traduction, terminologie, rédaction*, 4(1), 19-32.
12. Peng, H. (2018, March). The impact of machine translation and computer-aided translation on translators. In *IOP Conference Series: Materials Science and Engineering* (Vol. 322, No. 5, p. 052024). IOP Publishing.



13. Puchala-Ladzinska, K. (2016). Machine translation: A threat or an opportunity for human translators? *Studia anglica resoviensia.*, 13, 89–98.
14. Riccardi, A. (2005). On the evolution of interpreting strategies in simultaneous interpreting. *Meta*, 50(2), 753-767.
15. Seeber, K. G. (2015). Simultaneous interpreting. In H. Mikkelsen & R. Jourdenais (Eds.), *Routledge handbook of interpreting* (pp. 79–95). Routledge.
16. Seligman, M., Waibel, A., & Joscelyne, A. (2017). Taus speech-to-speech translation technology report. *De Rijp: TAUS BV*.
17. Sefhocl, M. (2017). The evolution of simultaneous interpretation. *6th annual international conference on language, literature and linguistics (L3 2017)*. DOI: 10.5176/2251-3566_L317.126.
18. Sreelekha, S., Bhattacharyya, P., Jha, S. K., & Malathi, D. (2016). A survey report on evolution of machine translation. *Int. J. Control Theory Appl*, 9(33), 233-240.
19. Youssuf, M. H. (2006). كيف تترجم [How to translate]. Cairo: Egyptian Books Library.