



ISSUES OF IMPLEMENTING MACHINE INTERPRETING INTO THE SPHERE OF MEDICINE

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ToshDO‘TAU tayanch doktoranti

Annotatsiya. Ushbu maqolada tibbiyot sohasiga hozirda rivojlanib borayotgan mashina tarjimasini tatbiq etishda yuzaga keluvchi muammolar ko‘rib chiqiladi va ularga muvofiq yechimlar ilgari suriladi. Shuningdek, mashina tarjimasining yutuqli jihatlari va kamchiliklari tadqiq etilib, inson tomonidan amalga oshirilgan tarjima hamda mashina tarjimasini natijalari qiyosiy o‘rganilib, tegishli xulosalar chiqariladi. Mashina tarjimasining tibbiyot sohasida sinxron tarjimini amalga oshirishdagi o‘rni borasida tadqiq etiladi.

Abstract. This article reflects the problems in the implementation of currently developed method - machine interpreting to the sphere of medicine and provides effective solutions to the issue. Furthermore, benefits and disadvantages of machine interpreting are investigated and comparative study about the productivity of machine interpreting and interpreting process by specialists is carried out. Discussing the role of machine interpreting and translation in the training of medical interpreting experts, the article reflects precise conclusion in the field.

Аннотация. В данной статье отражены проблемы внедрения разрабатываемого в настоящее время метода машинного перевода в сферу медицины и предложены эффективные решения данного вопроса. Кроме того, исследуются преимущества и недостатки машинного перевода и проводится сравнительное исследование производительности машинного перевода и процесса устного перевода специалистами. Обсуждая роль машинного устного и письменного перевода в подготовке специалистов по медицинскому устному переводу, статья отражает четкие выводы в этой области.

Kalit so‘zlar: *Mashina tarjimasini, Lexifone, ovozni aniqlash.*

Today, computer science is being developed in an accelerating pace. In many spheres of life, people began to use this advantage instead of using human work power. One of these disciplines is called medical interpreting domain. When there is a language barrier between medical specialists and the patient, the healthcare setting tries to solve this problem by hiring professional medical interpreters in order to render accurate information about patients and treat sick people in a quality manner. The basic issue about the case is that healthcare setting cannot always find professional experts in this field. Because medical interpreting is such a complicated sphere that not all interpreters involve in this discipline. Medical interpreting requires deep medical knowledge as well as foreign language acquisition. So the burden of the career is more than other branches of interpreting. So, in rare cases

people choose to become medical interpreting expert. The lack of specialists in the field has become a trigger to investigate computer science to solve the problem in an effective way.

Machine interpreting (Automated interpreting) is a new term which can prove a fairly new technology. Machine interpreting can be used to convert spoken words into different languages. In the domain of computer science, *Speech – to –Speech translation* specifically refers to the translation of spoken content from one language into spoken content in a different language. Another explanation of the term is that “Machine interpreting is the transmission of a spoken message in one language into a spoken message in a different language using artificial intelligence (AI), without the input of a human interpreter”. It is worthy to mention that the first attempt to build a speech – to- speech translation system was carried out in 2016 by a group of French researchers. Using only a small corpus, the team tried to obtain effective results from their MI engine. Their conclusion was that in order to implement smooth interpreting process they should train future MI engines on more varied datasets. Actually, machine interpreting combines two forms of technology: **voice recognition software** and **machine translation**. To identify source language, translation technology uses Automatic Speech Recognition (ASR) and to speak the message in the target language, they use a synthetic voice. This process consists of three basic stages:

- *Voice recognition software picks up a speaker's voice and renders it into text;*
- *The text is run through a machine translation program;*
- *The translated text is automated into speech in the target language.*

Since medical interpreting experts are not always available for interpreting services in healthcare settings, medical specialists tend to use machine translation technology for interpreting medical content. They consider this method as an effective way to supplement their communication. Initially, machine translation was developed to facilitate simple text-to-text translations. However in recent years it produces more complex translations by incorporating more sophisticated algorithmic approaches. As a result, machine interpreting has begun to be considered as one of the modes of interpreting sphere.

Nowadays, there are a number of programs which can render medical content from one language to another. In healthcare settings, specialists may use a number of translation programs including: *Google translate, Microsoft Bing Translator, DeepL Translator, SYSTRAN Translate, Amazon Translate and etc.* There is also machine interpreting service such as *Lexifone* which has been established by Israeli startup company [Sanita, 2022: 76]. They can be used as an interpreting aid during the process but they cannot provide complete interpreting output due to number of reasons.

Despite having several beneficial sides (e.g. Speech - to – Speech translation can also function live, or in real – time or streaming mode, to use more technical

terminology) machine interpreting cannot always provide promising results in the sphere of medicine due to some reasonable issues. The core problem with machine interpreting is its basis in machine and automated translation. Mostly machine translation can provide the gist of the statement but it is not acceptable in situations which require high accuracy. Sometimes, voice recognition software cannot provide perfect product. In terms of medical cases, accurate interpreting output is so crucial that it has a high influence on the patient's health. As well as having numerous beneficial sides, machine interpreting cannot provide confidential results all the time. In the sphere of simultaneous interpreting there are a lot of interpreting strategies and techniques which can be used effectively only by medical interpreting experts. Considering the particular case, experts choose effective interpreting techniques and solve problems related to the language. The following issues should be considered in machine interpreting:

- Adapting the mouth movements of the speaker to the translation (or vice – versa) and create almost perfect synchronicity.
- Considering context when interpreting tricky language units like homonyms. Medical interpreting involves a thorough grasp of medical terms in both source and target languages.
- There is no possibility to edit the result: the users will consume the raw translation.
- The system must construct a logical and articulate flow of text in the target language, starting from partial segments of speech.
- One of the most effective techniques of interpreting - Anticipation cannot be used in machine interpreting.
- In automated interpreting, there is a risk of using medically offensive terms. (Checking any term with knowledge of the clinical field is essential) [Amrita, 2021; 91].

Google translate in medical communication. Google translate uses statistical matching to translate rather than depending on a dictionary or grammar rules approach. Unfortunately, the method “just Google it” cannot be used in life saving communications between doctors and patients. According to recent statistics, Google Translate has only 57.7 % accuracy when used for medical phrase translation. It means that medical interpreting process cannot be carried out based on translation tools. This also proves that implementing machine interpreting in the sphere of medicine is a very critical issue [Douglas, 2022: 101]. In the investigation, the following errors have been identified and analyzed:

Example 1:

*The **bundle of His** is a group of fibers that carry electrical impulses through the center of the heart. If these signals are blocked, you will have problems with your heartbeat.*

Google translate: *Uning to'plami* yurakning markazi orqali elektr impulslarini o'tkazadigan tolalar guruhidir. Agar bu signallar bloklangan bo'lsa, siz yurak urishi bilan bog'liq muammolarga duch kelasiz.

Correct version : *Gis to'plami* yurakning markazi orqali elektr impulslarini o'tkazadigan tolalar guruhidir. Agar bu signallar bloklangan bo'lsa, siz yurak urishi bilan bog'liq muammolarga duch kelasiz.

When using google translate tool, the term “His bundle” was translated as “Uning to'plami”. But when we checked the medical context in the Uzbek language, we discovered that this kind of term is not used in the Uzbek medical language.

Solution: Discussing with the professional medical expert. When we discussed with the specialist firstly he confirmed that they use this term in the sphere and defined the above mentioned term: His bundle or the bundle of His is a group of fibers that carry electrical impulses through the center of the heart (Gis tutami - yurakning markazi orqali elektr impulslarini o'tkazadigan tolalar guruhidir).

Example 2

*In addition to active ingredients, most **tablets** contain additives that hold the pill together and improve the taste, texture, or appearance.*

Google translate: *Faol moddalarga qo'shimcha ravishda, **planshetlarning** ko'pchiligi tabletkani bir-biriga bog'lab turadigan va ta'mi, tuzilishi yoki ko'rinishini yaxshilaydigan qo'shimchalarni o'z ichiga oladi.*

Correct version: *Faol moddalarga qo'shimcha ravishda, **tabletkalarning** ko'pchiligi ularni bir-biriga bog'lab turadigan hamda ta'mi, tuzilishi yoki ko'rinishini yaxshilaydigan qo'shimchalarni o'z ichiga oladi.*

Rendering homonyms in machine interpreting. One of the most problematic issues of machine interpreting is rendering homonyms in the process. Medical interpreting experts have a chance to identify the term by considering the context or asking explanation from the speaker while the process is going on. But in machine interpreting, if the term is not mentioned in the database there is a high risk to render it in a wrong way. The term “**BS**” has three meanings:

- *Blood sugar, Russian. уровень сахара в крови. Uzbek. qondagi shakar;*
- *Bowel sounds, Russian. звуки кишечника, Uzbek. ichak tovushlari;*
- *Breath sounds, Russian. звуки дыхания, Uzbek. nafas tovushlari.*

The solution for this problem can be including all meanings of homonyms when forming database for machine interpreting. They should be mentioned in both Uzbek and English languages.

In November 2016, Google informed that it changed its way of working manner. It began to use neural machine translation which is a deep learning tool that regularly compares whole sentences at a time from many linguistic sources to translate language units. Despite this advancement, Patil and Davies found serious errors in translations of common medical terms [Flores, 2005: 2010]. This means that Google Translate does not always reflect accurate rendering of medical content.

Cultural awareness. In the healthcare and medical fields, professional interpreters are required to be aware of cultural nuances, which might range from standard medical procedures to idiomatic expressions that may be misunderstood. In machine interpreting, this may be a problematic issue. Machine translation technology may not be aware of medically offensive terminology. For example, “harelip” is a term used to describe an individual with a congenital split in their lip or palate. “Cleft lip” and “cleft palate” are accepted in modern usage instead of “Harelip”. When using Google Translate, it has rendered the terms as “harelip”. Through ages, harelip was associated with negative connotations. Young people with *cleft lip* have several functional and aesthetic problems including trouble clothing their mouth, feeding difficulties, hearing difficulties and speech difficulties. Using the offensive term for them due to the misinterpreting may cause dangerous consequences such as anxiety, depression and even suicide [Hsieh, 2006: 55]. In a word, machine interpreting is to be highly developed to the level of differentiating special linguistic units before its introduction to the medical field.

Using medical interpreting expert during the medical interpreting process enhances the possibility that the interpreter would interpret literally and objectively with high-quality language skills. Effective medical communication between these two languages requires investigation in the translation techniques which are expected to use to make medical interpreting process safe and high quality. In order to improve the quality of machine interpreting, the following changes should be implemented: To have a large database of Uzbek and English medical terminology; to reflect specific features of medical language; to be aware of medical terms' structure; to be aware of confusing medical terms; to analyze medical terms in these two languages. To conclude, machine interpreting should be developed as a perfect interpreting tool since any single minor mistake may cost patient's valuable life and this mistake can never be forgiven.

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