Al-Noor Journal for Humanities, Issue (2) , June 2024
DOI: https://doi.org/10.69513/jnfh.v1.i.2.en4

IRAQI Academic Scientific Journals

ISSN: 3005-5091
AL-NOOR JOURNAL FOR HUMANITIES
Available online at : *http://www.jnfh.alnoor.edu.iq*

JNFH
Al-Noor Journal for Humanities

Artificial Intelligence in Arabic-English Translation: Comparative Linguistic and Stylistic Analysis for Selected Qur'anic Verses

Asst. Prof. Ayad Enad Khalaf (PhD)
Sunni Endowment
dr.ayadenad@gmail.com

Iman A. Abdulrahman (MA)
Madenat Alelem University College
iman.abd@mauc.edu.iq

Abstract
Artificial intelligence (AI), in recent years, has become a very real tool that can aid society in addressing many issues, including the challenges faced in the translation. In recent years, Arabic-English or English-Arabic translations have been generally influenced by the technologically driven approaches, like Google translation machine, in handling meaning between the two languages during the translation. The ubiquity of computing has become apparent and has demonstrated that the Arabic-English or English-Arabic translations can be achieved using AI-driven tools. Data collection of the current study included translating some texts in the Holy Quran from Arabic into English to show how translation by AI differs from human translation in many aspects. By analysing these data, this study discusses adopting AI in Arabic-English Translation based on the subfields of AI; machine learning and natural language processing (NLP). The findings reveal that AI subfields can be developed further in Arabic-English Translation, especially machine learning and Natural Language Processing (NLP).

AI projects on Arabic-English translations need adequate funding to establish sound connection between AI and Arabic translations into other languages or vice versa. Absence of the funding would limit AI's potential and its applicability to all forms of Arabic-English i.e., literary and techno-scientific text. The research concludes by providing examples of how these subfields are being developed in Arabic-English translations for future research.

Keywords: Artificial intelligence, Arabic natural language processing Machine learning · Qur'anic NLP · Religious texts · Classical Arabic.

الذكاء الاصطناعي في الترجمة من العربية الى الإنجليزية: تحليل لغوي وأسلوبي مقارن لآيات قرآنية مختارة

أ.م.د. اياد عناد خلف
دائرة التعليم الديني والدراسات الاسلامية/ ديوان الوقف السني

م.م. ايمان عبد القدوس عبد الرحمن
كلية مدينة العلم الجامعة/ بغداد

الملخص: أصبح الذكاء الاصطناعي (AI) في السنوات الأخيرة أداة حقيقية للغاية يمكنها مساعدة المجتمع في معالجة العديد من القضايا، بما في ذلك التحديات التي تواجه الترجمة. تأثرت الترجمات العربية-الإنجليزية أو الإنجليزية-العربية في السنوات الأخيرة بشكل عام بالأساليب التكنولوجية مثل آلة الترجمة جوجل، في التعامل مع المعنى بين اللغتين أثناء الترجمة. لقد أصبح انتشار الحوسبة في كل مكان واضحًا وأثبت أنه يمكن تحقيق الترجمات من العربية الى الإنجليزية أو من الإنجليزية الى العربية باستخدام أدوات تعتمد على الذكاء الاصطناعي. وتأتي بيانات هذا البحث من ترجمة بعض نصوص القرآن الكريم من العربية إلى الإنجليزية لتوضيح مدى اختلاف الترجمة بواسطة الذكاء الاصطناعي عن ترجمة الإنسان في جوانب عديدة. وعبر تحليل هذه البيانات، تقدم هذه الورقة مناقشة حول اعتماد الذكاء الاصطناعي في الترجمة من العربية إلى الإنجليزية بناءً على المجالات الفرعية للذكاء الاصطناعي؛ التعلم الآلي ومعالجة اللغات الطبيعية (NLP). وتشير النتائج إلى أنه يمكن تطوير الحقول الفرعية للذكاء الاصطناعي بشكل أكبر في الترجمة من العربية الى الإنجليزية ولا سيما التعلم الآلي، ومعالجة اللغات الطبيعية (NLP). تحتاج مشاريع الذكاء الاصطناعي المتعلقة بالترجمات من العربية إلى الإنجليزية إلى تمويل كافٍ لإنشاء اتصال سليم بين الذكاء الاصطناعي والترجمات العربية إلى لغات أُخر أو العكس. ومن

شأن غياب التمويل أن يحدَّ من إمكانات الذكاء الاصطناعي وإمكانية تطبيقه على أشكال النصوص المترجمة من العربية الى الإنجليزية جميعها، أي النصوص الأدبية والتقنية العلمية. ويختتم البحث بتقديم أمثلة لكيفية تطوير هذه الحقول الفرعية في الترجمات العربية الى الإنجليزية للبحث المستقبلي.

الكلمات الافتتاحية: الذكاء الاصطناعي، معالجة اللغة العربية الطبيعية • التعلم الآلي، معالجة اللغة الطبيعية للقرآن • النصوص الدينية • اللغة العربية الفصحى.

1. Introduction

Technology and data become essential factors that guide large clusters of decisions in the life of people in present time. This drives many scholars to expand their knowledge and experiences and to study the artificial intelligence (AI) capabilities in different field of life and their development every year. According to Broussard et al. (2019: 673), the concept of AI refers more narrowly "to a branch of computer science focused on simulating human intelligence".

Artificial Intelligence (AI) and its implications such as NLP in the Holy texts which are written by languages that don't have Latin letters like Arabic, makes the process of machine translation more complicated and may face some obstacles for two reasons. First, Arabic has a special system that differs from English in the shape of letters and words, has its own sentence structure, has its own orthography, has the diacritics system, and its script doesn't have capitalization. Second, dealing with holy texts, such as the Qur'an as a divine book, requires precaution so that its semantics or information retrieved remains intact (Salloum et al. 2018). Understanding the meaning of the words in the Holy Qur'an" is one of the AI challenges as this requires other tasks such as reasoning, knowledge representation, and knowledge extraction.

This study reviews the researches that applied in the Qur'anic NLP including the techniques and tools that are used in the process of translating the Holy Qur'an. It also focuses on the challenges in the field of Qur'anic NLP to help the researchers to work ahead.

In this context, this study aims to make a theoretical contribution by drawing upon literature on artificial intelligence

to sketch an outline of the field of translation and to understand where this field is positioning itself. Thus, this study poses the following questions:

1- How is translation positioning itself in the subfields of artificial intelligence?
2- To what extent is translation dealt and processed by AI?
3- What are the obstacles that face AI in the process of translation?
4- What are the limitations and pitfalls of Qur'anic NLP works?

By answering these questions through the lines of the analysis, this study is to contribute by explaining and it describing the types of obstacles that face AI to help translators to understand the possibilities, implications, and responsibilities that may face from adoption and use of AI. Moreover, it provides a comprehensive analysis of some religious text from the Holy Qur'an to encourage scholars and professionals to consider further steps for utilizing AI in translation.

1.1 Literature Review

There are some recent research studies (Huang, 2015; Meftouh et al., 2015) that discuss the issues and challenges of machine translation of the Arabic language. One of them is Huang's, who suggests several solutions to handle challenges being faced in bringing the quality of machine translation. He suggests using the dialect classifier output to build a compatible, dialect-specific Arabic-English MT system. The dialect classifier identifies the type of dialect before translating and sending it to the corresponding MT system of English-to-Arabic (MSA) translation system. The researcher feels that since the in-domain data of the Arabic language contains lots of dialects, an issue taken up later in this study, it will be a good idea to maintain a cleaner LM with the assistance of an effective dialect classifier to filter out all DA elements and only retain the MSA elements.

In another study, Meftouh et al. (2015) devise a Parallel Arabic DIalect Corpus (PADIC) that focuses on the statistical MT experiments from MSA to DA and vice versa and conducts experiments on cross dialect Arabic machine translation. Meftouh et al. (2015) claim that PADIC comprises major dialects of the Arab region and a special attention has been paid to align each dialect with MSA. This study uses at least eight dialects (two dialects from Algeria, three from Maghreb, two from the Middle-East (Syria and Palestine) and one from Tunisia). Meftouh et al. (2015) also have found some constraints in devising this corpus namely a lack of dialectal Arabic parallel corpora, colloquial nature of Arabic dialects as most of them are used only for conversations and not for writing, and above all, the small size of the available corpora.

However, for this purpose of analyzing the effect of LM on MT process, they vary the smoothing techniques and interpolate it with PADIC, which they claim to be the largest corpus working on dialects.

Zbib et al. (2012), too, mention Levantine- English and Egyptian-English parallel corpora. In their study, the authors perform a few machine translation experiments in order to show a variety of attributes like a limited MSA data, the utility of inter-dialect learning, the impact of both morphological analysis and translating from a particular dialect to MSA and then to English. Zbib et al. (2012) claim to have discovered a process of developing a Dialectal-Arabic-English parallel corpus, for which they need to select passages containing non-MSA words from any available corpus on the Arabic web text, and use crowd sourcing method for classifying the text dialect wise and segmenting them into individual sentences before translating into English. This study seems to be a canonical one because several other works in this domain have proposed a similar experimentation of processing Arabic dialects and recommending the part-of-speech (POS) tagging, diacritization, building of lexicon and analyzing text morphology (Zbib et al., 2012).

A study on Arabic machine translation was conducted to investigate the methods that utilize machine interpretation accessible in writing and to energize analysts to think about these methods. This overview centred on the summarization of major procedures utilized in machine interpretation from Arabic into English, and talks about their qualities and shortcomings (Alqudsi 2014). Other various surveys (Alqudsi 2014, Elsherif 2017, and Ameur 2020) were conducted in which the topic of Arabic machine translation to other language and concluded that it is difficult to design a good MT system that satisfies human criteria (Alqudsi 2014).

2. Artificial Intelligence and its Current Manifestation

Artificial intelligence is not new as it dates back to 1955 when Stanford University's Professor John McCarthy used the term to describe the science and engineering of making intelligent machines (McCarthy 1998). The pervasive nature of information and communications technology (ICT) and have expanded their applicability in a variety of fields, such as translation.

AI is concerned with understanding and building intelligent entities that can compute "how to act effectively and safely in a wide variety of novel situations" (Russell and Norvig 2021, p. 19). Therefore, intelligence involves performing human tasks such as recognizing images or performing repetitive tasks (Broussard et al. 2019). In this sense, some authors understand intelligence in AI as rationality, which can be loosely understood as making correct decisions (Russell and Norvig 2021).

It is known that normal machines work according to the input information and don't have the ability to go further than these inputs, but nowadays technology tries to create machines that work with AI that imitate human beings in thinking and decision. Thus, Castro and New 2016 have defined AI as the process of "creating computing machines and systems that perform operations analogous to human learning and decision-making" (Castro and New 2016, p. 2). Machine Learning and

decision-making are two abilities that AI tries to add to these machines.

The most popular of these subfields is machine learning, which is a "subfield of AI that studies the ability to improve performance based on previous experience" (Russell and Norvig 2021, p. 19). This kind of learning imitates human learning which also depends on previous experience and scheduled information. But it differs from human learning in that human beings have the ability of thinking and developing ideas more than what they have learned, and that what machine learning tries to achieve through developing the quality of learning.

This kind of development relates with deep learning and predictive analytics. These two abilities can be developed through number of statistical techniques that are used to solve problems with little human intervention, because solving problems relays on large and complex datasets to replicate the human brain's learning capabilities (Chan-Olmsted 2019; Hassaballah and Awad 2020). Predictive analytics, on the other hand, is a branch of machine learning that is dedicated to making predictions about future outcomes using historical data (Russell and Norvig 2021).

Natural language processing (NLP) refers to the automatic computational processing of human language (Castro and New 2016). In other words, NLP refers to the ability of computer program in dealing with language texts and words like humans do by understanding and responding to text or voice data, extracting meaning from sentences, or generating readable texts (Deloitte 2014). NLP and its applications in translation have their own advantages and disadvantages. Relying on translating various texts using artificial intelligence brings many benefits and advantages. Among the most prominent features of this method of translation are the following:

1- The ability to translate huge amounts of words in any language in the fastest time and with the least effort.

2- The ability to translate into any language, including rare languages in which it is difficult to find specialized human translators.
3- It is characterized by providing translation operations at a very cheap cost compared to human translation.
4- Translate various types of multimedia easily, such as video clips and audio clips, with high accuracy.

In addition to the advantages available in translation using artificial intelligence tools, there are a group of disadvantages and problems facing people who rely on this method of translation heavily during their work, and the most prominent of these disadvantages are as follows:

1- Sometimes literal translation without understanding the general context of the translated text.
2- Translating phrases sometimes inaccurately, especially when translating complex words.
3- Translation in a rigid manner without a creative element or adding a human character to the text in a way that expresses feelings and emotions, especially in literary texts.
4- Doubts about the extent to which the privacy of the texts being translated is preserved and the possibility of using them for purposes other than translation.
5- Difficulty in accurately understanding accents when translating audio clips.
6- Sometimes the translation of phrases in rare languages is highly inaccurate.
7- Inability to translate complex and specialized terms accurately in many cases.

3. Machine Learning and Arabic NLP in translating the Holy Quran

Machine learning, as it is explained earlier, helps computers to improve their performance based on previous experiences to understand the human language i.e., words,

sentences, and paragraphs, for the analysis and synthesis of text, but the different written grammar and syntax between the two languages Arabic and English makes the NLP inadequate to accommodate these issues in AI space especially, when these words have their meanings in cultural context.

The Qur'an is the religious book of Islam that includes various texts revealed in the Arabic language. Thus, knowing the Arabic language helps in understanding the true message of the Qur'an. Though the Qur'an, as a text, is short, there is a huge volume of supporting work filling tens of thousands of volumes, e.g., commentaries, exegesis, etc. These huge of commentaries come as a result from the rhetorical language of the Qur'an which required interpretation for the Arabic readers as well as a translation for the non-Arabic readers. Moreover, most of the Qur'anic verses are related to definite contexts that make understanding these verses difficult task or result ambiguous meaning without knowing these contexts or the reasons of the revelation. By the developing of AI and the need of translating the Qur'an by common people, non-specialised researchers, and scholars, many of these religious texts were fuelled by the recent advances in computational and natural language processing (NLP) techniques. These techniques, from the first hand, will facilitate and help people to gain knowledge easily and from the second hand will encourage scientific scholars and research to study the language of the Q and Arabic language as an international language. Thus, the advances in computational techniques, especially in the field of natural language processing (NLP), NLP is leveraged for facilitating Qur'anic research and studies and opens up avenues for developing new applications that can help those interested in learning and understanding the Qur'an.

4. Arabic NLP and some of its challenges

Arabic is a Semitic language that first emerged in the first to fourth centuries CE. This is testified by the various Arabic inscriptions found in the region from that era (Al-Azami 2020, pp.

126–129). The Arabic language alphabet consists of 25 consonants and three long vowels. One may ask how a language such as Arabic has only three vowels. The answer is that Arabic has a special system that differs from English which is the diacritical markings. According to this system, each consonant sound is attached with diacritical markings that are similar to the short vowels (a, i, u), and these are placed either above or below the character. This nature makes the pronunciation of consonant easy task even when there were three or more consecutive consonants in the same word. Moreover, this system enables the readers to recognise the words that have the same letter in writing with different pronunciation. Another difference between Arabic and English is the direction of the writing as it is written from right-to-left in a complex cursive script that permits a variable degree of stretching or compressing (Azmi and Alsaiari 2014).
Arabic also has remarkable feature that is its expressiveness. This means that a single word such as {فأسقيناكموه}[1] , *fAsqynAkmwh*[2] which appears in the Qur'an, is equivalent in translation to the complete sentence "*and We have given it to you to drink*".

In the case of NLP, Arabic may be considered as a difficult process for reasons such as; the rich nature of the Arabic language, its complex grammatical and syntactic structures, and its morphology system. Farghaly and Shaalan (2009) detailed some challenges and problems that have to be tackled while performing NLP tasks related to MSA. Most of the work on Arabic NLP involves MSA, the most widespread and literary form of Arabic. Some of the challenges involved in doing Arabic NLP research are:

1- There is no capitalization in the Arabic script. This makes it hard to identify proper names and further complicates the process of Named Entity Recognition (NER), a basic NLP task.

[1] Hud (11:22)
[2] We transliterate Arabic words using the Buckwalter Transliteration system.

2- The other problem is that Arabic language has the diacritics which add sense and meaning to a word, and the lack of it creates ambiguity. For example, the Arabic word سري according to its diacritics may have more than one meaning. If the word سري is pronounced as *sari*, it means as a *rivulet* but if it is pronounced as *sirry*, it means *secret*, although the two words have the same three letters in their shape of Arabic writing. Thus, the word سَرِيًّا *sariya* in the sentence (قَدْ جَعَلَ رَبُّكِ تَحْتَكِ سَرِيًّا)[3] has been translated wrongly by GT as *secret* because it couldn't recognize between the two Arabic words according to their diacritics. However, if the word has been properly diacritized, there would not have been any confusion. Unfortunately, the writing custom in MSA is devoid of any diacritical marking. It assumes the reader can disambiguate the meaning through context. This makes translating Arabic more complex process.

3- Habash (2010) described the problem that is faced during the translation from Arabic as its sentence structure is totally different from English and the translated sentence has then to be structured properly to make some sense. Arabic has a sentence structure that differs from English in many faces, and one of these faces is the sentence structure. While sentence structure in English is SVO, Arabic sentence structure is VSO and VOS. Because the subject and the object are nouns and can replace their places easily in Arabic, it is difficult for translation machine to define who the subject is and who the object is.

4- In doing basic Arabic NLP, one of the challenges arises is that the text of the Qur'an has its own orthography (spelling convention) which differs even from Classical Arabic. The drawing of the Qur'an differs from the spelling line in some of its phenomena, not in all. The rules of spelling are a drawing of analogy, in which the letter comes in

[3] Maryam: Mary (19:24)

accordance with the word, unlike the Qur'an drawing, which is not measured by anyone else, and the matter of drawing was limited to six rules, namely omission, addition, replacement, the hamza, the split, and the link. For example, in the sentence سَلَٰمٌ عَلَىٰٓ إِلۡ يَاسِينَ *salamun ala ilyasin* there are two ambiguities that are faced by machine translation. the first one is the omission of the second letter (أ) *a* in the word سَلَٰمٌ *salamun* which make recognizing of the word as a noun (*salam*) or as a verb (*selm*) more complex. The second one is the split of the word إِلۡ يَاسِين *il yasin* in to two parts which also may produce an ambiguity in defining the intended meaning.

5- Another big challenge in dealing with Qur'an is that it is considered a divine scripture, which demands extra precaution so that its semantics or information retrieved remains intact (Salloum et al. 2018). Performing NLP tasks in a language with all these problems is not an easy task and requires technical as well as linguistic support. This need to translate religious texts stems from the fact that they are references and guides to many peoples in various cultural settings. Religious texts are essentially divine texts with the miraculous composition that cannot be imitated or reproduced by other languages, as in the case of the Holy Quran (Ayad Enad Khalaf & Othman M. Mahmood 2019). In the data analysis section, the analysis will show how performing NLP hasn't given any precaution when it deals with divine text such as the Holy Qur'an.

6- Atwell et al. 2010 point out that "Understanding the Qur'an" can be considered as a grand AI challenge for various tasks such as reasoning, knowledge representation, and knowledge extraction based on Qur'anic text among other challenges that have to be solved by leveraging the power of the latest NLP techniques (Atwell et al. 2010). It can be said that understanding the Quran properly requires understanding the interpretation of the verses and the reasons of their revelation. Though the Qur'an, as a text, is

short, there is a huge volume of supporting work filling tens of thousands of volumes, e.g., commentaries, exegesis, etc.

All these challenges will be the start point for diagnosing the background of problems that face the AI in translating Arabic text through analysing some verse from the Holy Quran.

5. Procedures and Data Analysis

The data of this study is first thirty-five verse of Marriam (Mary) that include the story of the birth of the prophet Jesus (peace be upon him). After that the researcher makes a comparison between machine translation, such as Google Translation, and human translation such as Pickthal to find the difficulties that may face machine translation and the means of overcoming them. These difficulties and the reasons behind them become the base theory for this study.

It can be said that machine translations such as Google Translation (GT) can give proficient literal translation for various texts, but in the case of the texts that need going through the background of the texts, such as religious texts, it may ignore some factors that are necessary in giving the most accurate translation such as; the context of the speech or discourse, the position or the rank of the speaker, the situation in which the speech is presented, and thus it may not reach the required translation. This section has divided these factors into five parts: word sense disambiguation, metaphorical expressions, selecting more literary words, rhetorical expressions, and context-based texts. Each part will be given an adequate explanation with examples from the verses of the Holy Quran.

1- Word Sense Disambiguation

One of the most problematic cases is word sense disambiguation, as in the following examples:

1- The Arabic word ذكر *Zikr* can be understood as either as a noun as *remembrance and mention* or as verb as *remember*,

remind, and *mention* and this depends on the intended meaning of the speaker, and this will create ambiguity, as in the following example:
{ذِكْرُ رَحْمَةِ رَبِّكَ عَبْدَهُ زَكَرِيَّا}[4] *zikru rahmat rabik abdahu Zachariah* Google Translate gave a wrong translation as *remembrance* instead of *mention* for the Arabic word ذكر *Zikru*. This comes from being Arabic has the diacritics which adds sense and meaning to a word, and the lack of it creates ambiguity.

2- Similarly with the translation of the sentence { وَاجْعَلْهُ رَبِّ رَضِيًّا}[5] *waj'alhu rabi radhiya* there are two ambiguities that are faced by GT, the first one is knowing the subject of the verb وَاجْعَلْهُ *waj'alhu* whether it was (I) as the speaker of a declarative sentence, or it was (you) as a subject for an imperative sentence. Thus, GT give the translation (*and I will make him*) instead of (*And (you) make him*). The other ambiguity in the same sentence is whether is the word رَضِيًّا *radiya* is a description for God as represented by the word رَبِّ *rab* or for the son who was asked by the prophet Zachariah as represented by the pronoun that attached with the verb وَاجْعَلْهُ *wajalhu*. Thus, GT give the translation (*a well-pleased Lord*) instead of *(acceptable (unto Thee*)).

3- Another word that has two meanings is the verb فَحَمَلَتْهُ *fahamelethu* in the sentence {فَحَمَلَتْهُ فَانْتَبَذَتْ بِهِ مَكَانًا قَصِيًّا}[6] which can be understood as to carry by hand or to carry him as a fetus in her womb which means as (conceived). Word sense disambiguation in this case required knowing the story itself in which the virgin Marry carry Jesus as a fetus in her womb. Thus, GT has given a wrong translation for this word as (So she carried him) instead of (And she conceived him).

[4] Maryam: Mary (19:2)
[5] Maryam: Mary (19:6)
[6] Maryam: Mary (19:22)

2- Metaphorical expressions:

1- In the example {وَاشْتَعَلَ الرَّأْسُ شَيْبًا}[7] *washta'al alrasu shayba*, GT couldn't recognize the metaphorical meaning of the metaphorical verb وَاشْتَعَلَ *washta'al* and thus it gives literal translation as (*my head has burned with gray hair*,) instead of (*my head is shining with grey hair*) as a reference to his old age.

2- The metaphorical phrase {وَقَرِّي عَيْنًا}[8] *wakari ayna* also required metaphorical translation such as (be consoled), but not a literal one such as (and soothe your eyes) as it is given by GT.

3- The verb وَهَنَ *wahana* in the sentence {إِنِّي وَهَنَ الْعَظْمُ}[9] *ini wahana aladhmu* is used metaphorically to describe the weakness of his old age. So it is translated by GT as "*my bones have weakened*" instead of "*the bones of me wax feeble*".

3- Precaution in Terms' Selection

The holy texts require more careful translation than other texts because these are speeches that related either to God (Glory be to Him) or to the His prophets and angles. The following examples will show how GT gives literal translation for some words to describe the God (Allah) or to the prophets.

1- GT translates the word شَقِيًّا *shakiya* in the sentence { وَلَمْ يَجْعَلْنِي جَبَّارًا شَقِيًّا}[10] *walam yaj'alni jabar shakiya* as *wretched,* and using such word to describe the prophet Zachariah may be considered as unliterary expression. It is known that there are synonyms words, and also there are two kinds of opposites; one with the use of prefixes such us un- in, im, ...etc. and the other is the opposite meaning of the adjective without using a prefix. , such as, the opposite

[7] Maryam: Mary (19:4)
[8] Maryam: Mary (19:26)
[9] Maryam: Mary (19: 4)
[10] Maryam: Mary (19:32)

of the adjective *happy*, can be *unhappy* or *sad* for example, the synonym of the word *sad* can be *miserable* or *unhappy*. Similarly, with the selection of the suitable synonyms requires knowing the suitable context that could be use in. Thus, the selection of the suitable word depends on some principles such as the context, the situation in which the action is happened, and the position or the rank of the person or the thing it relates to. So, in the case of translating the word (شَقِيًّا) *shakiya*, there are two selections, one is the literal which is *wretched* and the other is its synonym *unblest*. Using the later in describing the prophets is more literary and thus, it is more acceptable.

2- Similarly, with the word بَغِيًّا *Bagiya* in the phrase { وَلَمْ أَكُ بَغِيًّا}[11] *walem aku bagiya* which describes Marry, has been translated into (prostitute) by GT. More eloquent terms such as (unchaste) is more literary selection with the virgin Marry.

4- Rhetorical Expressions

1- One of the rhetorical styles in Arabic is the repetition of the same meaning using two different words as a kind of confirmation. In the case of translating the sentence { بَلَغْتُ مِنَ الْكِبَرِ عِتِيًّا}[12] *Balagt min alkibar itiya*, the adjective (عِتِيًّا) *itiya* refers to the extreme type of old age and it comes after (بَلَغْتُ مِنَ الْكِبَرِ) which have the same external meaning. Thus, GT translates it as (I have reached the age of old age) instead of giving the more precise translation which is (I have reached infirm old age).

2- The word (مُّسْتَقِيم) *mutakim* in the sentence {هَٰذَا صِرَٰط مُّسْتَقِيمٌ}[13] *hatha sirat mustakim* is translated by GT as (straight) which refers to the straightness of the bath or the way that Jesus asks his people to follow. The straightness which has

[11] Maryam: Mary (19:20)
[12] Maryam: Mary (19:8)
[13] Maryam: Mary (19:36)

the meaning of the steadiness may not give any reference whether the straight bath was right or wrong.

5- Context-based Texts

There are many words that could have more than one meaning and the selection of the right one depends on the context, as in the following examples:

1- The word (**الْمَوَالِيَ**) *Almawali* has various meaning in Arabic according to its context. In the sentence {وَإِنِّي خِفْتُ **الْمَوَالِيَ**}[14] *waini kiftu almawali* which is said by the prophet Zachariah, the word (**الْمَوَالِيَ**) *almawali* means my kinsfolk because, from the context, it is understood that the prophet Zachariah was speaking about his *kinsfolk*, but not his followers, and thus the right translation should be *kinsfolk*, unlike, GT which gave literal translation as *followers*.

3- The phrase (أَلَّا تُكَلِّمَ) *alla tukellim* in {قَالَ آيَتُكَ أَلَّا تُكَلِّمَ النَّاسَ}[15] has more additional meaning related to the story of the Zachariah when he asked Allah to show him a sign. God told him that his sign will be his inability to speak with the people for three days and nights. The intended meaning which refers to the inability of Zachariah for speaking is not written clearly in the text itself, but knowing the context and the story helps the translator in finding the right meaning. Thus, GT has translated this sentence literally as "*Your sign is that you will not speak to people for three nights." Together*." Here, GT didn't mention any thing about the inability of the body to speak without any bodily defect. But, when the translator takes the context in consideration, the translation will be as: "*Thy token is that thou, with no bodily defect, shalt not speak unto mankind three nights*." Adding this information to the translation text is very important because it is part of the miracle that god make with His prophet Zachariah.

[14] Maryam: Mary (19:5)
[15] Maryam: Mary (19:10)

4- The word غُلَامٍ *Gulam* in Arabic can be translated into a *boy, a son, a child,* or *a servant*, according to its context. In the sentence {إِنَّا نُبَشِّرُكَ بِغُلَامٍ}[16] *ina nubashiruk biGulam* the word غُلَامٍ *Gulam* means a *son* because the angles told the prophet Zachariah that he will have a son from his wife. Thus, GT didn't take the context in consideration and give general meaning such as *a boy*.

5- The word (فَأَوْحَى) *fa'awha* in the sentence { فَأَوْحَى إِلَيْهِمْ أَنْ سَبِّحُوا بُكْرَةً وَعَشِيًّا}[17] can be translated into an *inspired* or a *signified* according to its context. In other verses in the Holy Quran, when it used between the angles and human, it means the inspiration, but when it used between human beings themselves, it means *signified*. In the case of this verse, the prophet Zachariah *signified* to the people that he cannot speak to them, but not *inspired* to them, as GT did.

6- The word (حِجَابًا) *Hijaba* in the sentence { فَاتَّخَذَتْ مِنْ دُونِهِمْ حِجَابًا}[18] also has been translated literally by GT as *a veil* while it was seclusion because in the case of Marry, she had chosen seclusion by placing a screen (to screen herself) from; them but not wearing a veil.

7- The verb قَالَ *kala* (in Arabic) in the sentence { قَالَ إِنِّي عَبْدُ اللَّهِ}[19] has been translated literally by GT as (said). This translation is not wrong but it didn't carry any miracle because using the verb (say) with a baby doesn't carry any additional meaning related to the miracle of the speaking of the prophet Jesus. But using the verb (speak) has an implied meaning and additional meaning that is Jesus spoke when he was in the cradle.

8- The word (وَالِدَتِي) *walideti* which means (who bore me) in the sentence {وَبَرًّا بِوَالِدَتِي}[20] *wabaran biwalideti* that has been pronounced by Jesus, has more referential meanings than using the word (امي) *aumi* which means literally (my

[16] Maryam: Mary (19:7)
[17] Maryam: Mary (19:11)
[18] Maryam: Mary (19:17)
[19] Maryam: Mary (19:30)
[20] Maryam: Mary (19:32)

mother). This referential meaning assure that Jesus is the son of Marry who born him like any other human being, and thus, he is only a human being and prophet to his people and this is a message to his nation that he is not a god but a human being.

9- The word (سَرِيًّا) *sariya* in the sentence { قَدْ جَعَلَ رَبُّكِ تَحْتَكِ سَرِيًّا}[21] has been translated by GT as (secret) because it couldn't recognize between the two Arabic words سَرِيٍّ (*sariy*) and (سري) (*sirry*) which have the same three letter in their shape of writing while they have different pronunciation in Arabic according to the diacritics. Having no diacritics renders is problem, and thus it is difficult to determine which meaning to choose

10- The preposition (فَ) (*fe* in Arabic), that comes before the verbs and nouns in Arabic, has seven functions according to its use. It may come to combine two sentences with the meaning of *then*, *and, so, thus…*etc. and the selection of the right choice depends on selecting its right context. In the example {فَأَرْسَلْنَا}[22] *Fa'arselina*, the letter or preposition (فَ) *Fa* is translated by GT as (so) which required two sentences, cause and effect while in the target example the context required the meaning of (then) because it only refers to an arrangement of actions.

In light of the aforementioned analysis, machine translation is useful in translating simple general content or what tourists or internet surfers need, while religious texts such as the Holy Qur'an need high-quality, professional translation that is characterized by the human element. Machine translation is based on replacing words in one language with words in another language, and because this translation depends on inputs, it lacks the contextual and terminological knowledge that human translation provides. Translation that is based on artificial intelligence is superior to other types of translation in terms of

[21] Maryam: Mary (19:24)
[22] Maryam: Mary (19:17)

reducing financial costs and saving time, which is an important factor in our time. However, there remains a necessary need for a human translator to work on improving the quality of the final translation to ensure the required accuracy and suitability for the target audience.

Machine translation lacks the element of creativity and innovation, especially in creative and literary translation, which needs to unleash the translator's imagination to create new content. Moreover, although artificial intelligence has reached an advanced stage of development, it is not yet able to analyze body language, which plays an important role in communication between humans, nor can it detect aspects of humour or differences in vocal tones in written and spoken texts. In the fields of translation and interpretation, all of these factors affect the understanding of the text and its translation into the target language. This, in turn, always requires the intervention of a human translator to check the translation and ensure its accuracy, but this intervention changes according to the nature of the translated text. It is certain that artificial intelligence will contribute to creating new and more important roles for translators, which will lead to developing the field of translation and interpretation rather than controlling it. In the future, we may witness the ability of artificial intelligence to imitate humans in mastering their language, but this does not mean that it will eliminate the role of human translators. Despite the great technological progress and the entry of artificial intelligence into most areas of life, the human factor remains important and necessary to accomplish the required task optimally.

6. Conclusions

This study has dealt with the critical challenges during rendering Arabic text to English text and explained the reasons and ways of achieving the fulfilled type of translation, especially in the case of translating holy texts as in the Holy Qu'ran. The following issues are drawn:

- Dealing with Arabic, which has its own system, makes AI more difficult process that required special processes in terms of; its own sentence structure, its orthography, the diacritics system, and its special script.
- Although Google Translation (GT) has achieved high level of translations for various texts, it still faces some failures in the case of the texts that need going through the background of the texts. In the case of translating the Holy Qur'an, there are some failures in terms of the following reasons:
- Being Arabic is a language that has the diacritics which add sense and meaning to a word, and the lack of it creates ambiguity, word sense disambiguation results from the inability of AI in recognizing meaning of these words that doesn't have these diacritics.
- As the Holy Qur'an includes a lot of metaphorical expressions that need special dealing of translation, the process of translating these metaphor need special treatment because in metaphors there are hidden or indirect meaning which is not seen apparently by readers of metaphor, and thus translating these types of sentences or phrases also needs précised translation.
- Dealing with Holy Texts requires selecting more literary words and precaution during translating because these texts are related either to God (Glory be to Him) or to the His prophets, messengers, and angles.
- As the texts of the Holy Qur'an rich with rhetorical expressions, these types of expressions require special understanding which is result in special translation for these expressions.
- Understanding the Quran properly requires understanding its context because the latter helps the translator in finding the right meaning.
- Unlike other kinds of texts, the Quranic text is fixed, and for achieving successful translation fixed inputs are required in the case of machine learning and NLP.

Although translation by using artificial intelligence saves a lot of time and effort, especially in the case of translating large documents, there is still a need for a human element to humanize the text by modifying it creatively. This ultimately confirms that no matter how much artificial intelligence achieves great developments in the field of translation, it cannot fully perform the function of a human translator.

References

- Al-Azami MM (2020) The history of the Qur'anic text from revelation to compilation: a comparative study with the old and new testaments, 2nd edn. Turath Publishing, London.
- Alqudsi, A., N. Omar, and K. Shaker, *Arabic machine translation: a survey*. Artificial Intelligence Review, 2014. **42**(4): p. 549-572.
- Ameur, M.S.H., F. Meziane, and A. Guessoum, *Arabic machine translation: A survey of the latest trends and challenges.* Computer Science Review, 2020. **38**: p. 100305.
- Atwell E, Habash N, Louw B, Abu Shawar B, McEnery T, Zaghouani W, El-Haj M (2010) Understanding the Quran: a new grand challenge for computer science and artificial intelligence. ACM-BCS Visions of Computer Science.
- Azmi AM, Alsaiari A (2014) A calligraphic based scheme to justify Arabic text improving readability and comprehension. Comput Hum Behav 39:177–186.
- Broussard, Meredith; Diakopoulos, Nicholas; Guzman, Andrea L.; Abebe, Rediet; Dupagne, Michel; Chuan, Ching Hua. Artificial Intelligence and Journalism. *Journalism and Mass Communication Quarterly*; 2019; *96*, pp. 673-95. [DOI: https://dx.doi.org/10.1177/1077699019859901].
- Castro, Daniel; New, Joshua. *The Promise of Artificial Intelligence. Washington, DC and Brussels*; 2016; Available online: https://www2.datainnovation.org/2016-promise-of-ai.pdf (accessed on 1 November 2021).
- Deloitte. 2014. *Demystifying Artificial Intelligence*. New York: Deloitte.

- Elsherif, H.M. and T.R. Soomro, *Perspectives of arabic machine translation.* Journal of Engineering Science and technology, 2017. **12**(9): p. 2315-2332.
- Farghaly A, Shaalan K (2009) Arabic natural language processing: challenges and solutions. ACM Trans Asian Lang Inf Process (TALIP) 8(4):14 Future Today Institute 2018.
- Habash NY (2010) Introduction to Arabic natural language processing. Synth Lect Hum Lang Technol 3(1):1–187.
- Hassaballah, Mahmoud; Awad, Ali Ismail. *Deep Learning in Computer Vision*; 1st ed. Hassaballah, Mahmoud; Awad, Ali Ismail. CRC Press/Taylor and Francis: Boca Raton, 2020; [DOI: https://dx.doi.org/10.1201/9781351003827].
- Huang F (2015). Improved Arabic dialect classification with social media data. In Proceedings of the 2015 Conference on Empirical Methods in Natural Language Processing: 2118-2126.
- Khalaf, Ayad Enad. (2017). "Metaphorical Meaning and its Effect on Interaction". YOBE Journal of Language literature and Culture. Damaturu. Yobe State, Nigeria.Vol. (5). pp. 33-47.
- Khalaf, Ayad Enad & Othman M. Mahmood (2019)."The Role of Stylistic devices in the Formation of Equivalent Meaning in the Inter-lingual Transfer from Arabic to English". Midad Al-Adab Refereed Journal, Iraqi University, Baghdad, Iraq. Vol. (3). No.(Conferences of 2018-2019) pp.1121-1138.
- Khalaf, Ayad Enad (2020). "Metaphor for Teaching Philosophy". Journal of Linguistics and Translation Studies. Bayt Al-Hikma. Baghdad, Iraq. (No. (33) December 2020. pp. 9-24.
- Locker, Mic; Loucks, Jeff; Hupfer, Susanne; Jarvis, David. *Seasoned Explorers: How Experienced TMT Organizations Are Navigating AI*; Deloitte: New York, 2019.
- Mahmood, Othman Muhammed and Khalaf, Ayad Enad (2022). 'A Pragmalinguistic Analysis of Selected Arabic to English Translations for the (polysemic) Word "زعم" "Za'am' in the Gracious Quran'. Journal of Surra Man Raa,University of Samarra, Salah Ad Din, Iraq. Vol.18. No: 74. 17th Year. December/2022) (pp.1421-1436).
- McCarthy, John. What Is Artificial Intelligence?. *CogPrints*; Stanford, 1998; Available online:

http://cogprints.org/412/2/whatisai.ps (accessed on 30 September 2021).

- Meftouh K, Harrat S, Jamoussi S, Abbas M and Smaili K (2015). Machine translation experiments on PADIC: A parallel Arabic dialect corpus. In The 29th Pacific Asia Conference on Language, Information and Computation: 26–34.
- Pickthal, Muhammed Marmaduke. (1930). *The Meaning of the Glorious Kuran*. Glopal Gray (2018).
- Russell, Stuart, and Norvig eds. 2021. *Artificial Intelligence: A Modern Approach*, 4th ed. Harlow, UK: Pearson, Available online: https://www.pearson.com/us/higher-education/program/Russell-Artificial-Intelligence-A-Modern-Approach-4th-Edition/PGM1263338.html.
- Salloum SA, AlHamad AQ, Al-Emran M, Shaalan K (2018) A survey of Arabic text mining. In: Shaalan K, Hassanien AE, Tolba F (eds) Intelligent natural language processing: trends and applications. Springer, Cham, pp 417–431.
- Zbib R, Malchiodi E, Devlin J, Stallard D, Matsoukas S, Schwartz R and Callison-Burch C (2012). Machine translation of Arabic dialects. In Proceedings of the 2012 Conference of the North American Chapter of the Association for Computational linguistics: Human Language Technologies. Association for Computational Linguistics: 49-59.