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Research Article

Challenges in Translating Arabic Literary Texts Using Artificial Intelligence Techniques

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ABSTRACT

This paper explores the complexities and challenges in translating Arabic literary texts using artificial intelligence (AI) techniques. Arabic, with its rich history and intricate linguistic structure, presents unique challenges in translation due to its syntax, morphology, and cultural depth. Traditional translation methods often struggle with Arabic's semantic nuances, idiomatic expressions, and poetic constructs, which are crucial in literary works. AI techniques, specifically natural language processing and machine learning, offer promising advancements but face limitations in capturing the cultural and emotional resonance inherent in Arabic literature. This study examines current AI approaches, their capabilities, and the challenges they face in delivering translations that preserve both the linguistic and cultural authenticity of Arabic texts. Case studies are presented to illustrate the translation issues in AI-driven models, and future research directions are discussed, emphasizing the need for interdisciplinary collaboration to enhance AI's role in literary translation. This research provides insights into bridging the gap between human expertise and AI efficiency, aiming to improve the quality and accessibility of Arabic literary translations for global audiences.

1. INTRODUCTION

At 422 million speakers, Arabic is one of the most spoken languages in the world, famed for its rich storytelling, particularly in the realms of folktales, religion, and medieval romance, famously preserved in epics and both oral traditions. The rich depth of history endures today in many different varieties that remain proudly spoken and written by hundreds of millions of people. Yet with each new book, play, and poem in Arabic that is published, less than 0.01% of it makes it into the lifeblood of the global literary mainstream. [2]

The translation of Arabic literary texts is time and labor-intensive. There is no guarantee that readership will engage with a foreign book, poem, or play enough for a translator's sacrifice to ever pay off. Many translators of Arabic literature are non-Muslims with no traditional historical prose admittedly shut from both language and context, meaning the translation process is one of giving meaning from scratch. Even for Arabic-English translators, the range of dialects and influences means a constant ability to produce demographic importance so a raw novel does not read as constantly tied to religious tapestry or difficult geography. Translating literary texts with AI techniques therefore also faces a unique challenge. Neither word-by-word nor sentence-by-sentence approaches will work when different word forms could be preferred by different age groups or Arabic language speakers. In this subfield of translation, the well-oiled system maintenance that corresponds to usage is key. Successful approaches for AI to decode and translate Arabic language signage or to subtitle Arabic television are equally less important [1].

2. OVERVIEW OF ARABIC LITERATURE AND TRANSLATION

Knowledge of Arabic literature indicates, from a historical perspective, the evolution of Arab culture before and during the Islamic era, and reflects the phenomena of Umma and society with all their positive, negative, achieved, and missed potentials. Arabic literature is the literature produced in the Arabic language. Considering biographies, poetry, and works translated in an early stage of development, the field of Arabic literature is very large. It is important to comprehend the interaction among poetry, prose, people, literature, philosophy, and science in the Arab cultural ambient. Works by Arab authors are published in many genres besides literature and poetry. Translation is crucial because some literary pieces are of supreme significance, rich with aesthetic appreciation and long tradition, a mirror and embodiment of thoughts, philosophy, and practices of the member or adherent to a culture. [3]

This English-speaking world now has access to some distinguished Arabic literary items in English, which represent only a fraction of a vibrant, long, extensive, and intricate tradition. The presentation of Arabic literature to English-speaking societies as the representative composition of English writers has become one of the responsibilities of Arab scholars because of complex problematics. Because of the disparity between the systems and language, scientific, technological, and poetic backgrounds and beliefs of different societies, the major concern of translators is not the form, but the signification of original words and an attempt to communicate thoughts and senses into the target language [4] . It is very difficult to convey information through transferring two societies with different languages, since the other objections to a translation serve as proof of its cultural realities and demonstrate related literary structures and methodologies of the translation process. In Arab culture, there are various stylistic and structural methods, and we must preserve the original items along with the flavor of the original culture. As a research-focused perspective that guides linguistic theory and methodology from the point of view of sociology, linguistics, interpretation, deviation, social change, and return go together [5]. The interpretation is also a cultural, political, and economic one, not merely linguistic. In Arab society, literature is its lifeblood and reflects its civil, cultural, and ethical facets, which, as stated, combined with the imagination and demonstration of ideas, give the literature an obligation to represent it. Thus, the translation and labeling of authenticity in the target language, not only common tongues of the region, are undeniably needed [6].

3. ARTIFICIAL INTELLIGENCE IN TRANSLATION

A remarkable increase is witnessed in the use of the latest information processing techniques and digital computers, which cover many fields, among them translation. One of the applications of this technology is the translation of books from one language to another. The most important branches on which these technologies are based and into which these technologies have been directed are machine learning and natural language processing, which represent two areas of technologies closely related to the possibility of translating text. By applying machine learning to the processing of languages like natural language processing, it becomes feasible to transform a computer into an adequate translator, even as an interpreter, for written texts. This operation occurs using parallel corpora obtained by these techniques [7]. The main advantage of translation with artificial intelligence lies in the efficiency and speed of this technique in translating many texts over time. This method becomes weak when it becomes necessary to detect and respect many characteristics, such as idioms, metaphors, and wordplay, in translating literary texts. The use of technology in translating text efficiently and quickly makes translation using computer systems of great importance as an alternative to traditional translation methods, whatever they are. It is well known that the translation process using only the latest technologies, especially machine translation technologies, faces challenges that make it mandatory to work to develop it to reach satisfactory results similar to human translation. [8]

The application of the latest advances in artificial intelligence to such computers has increased the importance of this recent subject in this discipline. This technology, based on natural language processing and machine learning, allows for extracting linguistic and semantic relations modeled on parallel corpora. It is considered one of the successful automatic data processing applications and can convert any translated Arabic text into an equivalent English text. The translation can be done by one of the tools. In addition, the real-time multi-language tool helps in the translation from English into more than fifteen languages, including Arabic, in a satisfactory manner [9]. The biggest challenge for AI tools is to create an English text equivalent to the Arabic script that is translated, despite the many different languages having different characters, letter combinations, spelling, and grammar. But with the new neural machine translation technique, the latest research in machine translation enables the translation system to handle translations between many different languages using only one model. The Arabic script presents special issues and nuances, and it can be challenging to handle fully. Even the best machine translation system can confuse humans in their workload and also have an impact on the understanding of the translated text. It is necessary to harness the efficiency of machines and the expertise of humans in order to achieve the best result [10].

4. CHALLENGES IN TRANSLATING ARABIC LITERARY TEXTS

Arabic is a complex language with its unique syntax, morphology, semantics, and structural characteristics. This linguistic distinctiveness makes the job more complex for the translator since meaning is inevitably tied to the formal and semantic techniques used by Arab writers, which are too peculiar to be deciphered unless the translator is steeped in Arabic culture and poetry. Classical Arabic is crumbling under the stress of modern living. Yet modern Arabic remains awash with poetic expressions, verbal puns, etymological fallacies, and terminological camaraderie, which a translator in the Anglo world strives to render vivid and alive. The Arabs take unkindly to a translation of their poets rendered corpse-like through the bonsai treatment. These challenges are encountered in areas including lexis, syntax, style, and culture. [11]

Moreover, Arabic literary discourse is not one monologue but many, into which intertextualities, echoing motifs, and otherworldly resonance intrude. Another complexity of translation is the matching of narratives and contexts. The enigmatic impenetrabilities that arise in comparing poetic or prose styles make a nonsense of slogans about what "is" or "isn't" translatable, unless it be that the translator, like the work itself, somehow engrosses the reader, who then has to be perceived as an individual 'human being' or a 'parallel text'. Longfellow's rendering in English of the Divine Comedy of Dante is typical of a deep, powerful dialectical translation strategy. His work is a seemingly disjointed effort of intrusion and fidelity, invasion and a remarkable collaborative enterprise where Longfellow steps into the very shoes of Dante and at the same time offers him his own 'collaboratively' indelible stamp. [12]

4.1. Linguistic Complexity

In terms of the alphabet, Arabic is unique and challenging because of its abundance of sounds and letters that characterize it. It has up to 29 consonants and 3 vowels, which are impossible to express in other languages. This linguistic particularity in terms of the alphabet can also be a facilitator, as the Arabic alphabet contains a large number of letters. Its richness and expertise are multilateral, representing a challenge for the translator of the Arabic literary text, particularly due to the increased difficulty formed by the letters, which alternate in length and importance according to context. The Arabic language shares structural characteristics that reflect the typical features of Semitic languages, such as its types of grammatical inflection. Each of the linguistic properties has its own purposes. The use of a specific word is not accidental; it should be in proportion to its general linguistic context. In the face of a literary Arabic translation, the translator will almost certainly encounter different dialects and a number of synonyms in each dialect. [13]

The Arabic language has its own structure, which makes it difficult and complex to master compared to other languages, starting with the structure of simple sentences. In fact, words in Arabic may have synonyms or equivalents according to the intended meaning as well as the context. Another characteristic of Arabic is its grammatical nuances. For example, if you need to present a future action, you cannot simply add the suffix to the root to form a future tense. Therefore, one must also consider the indicative or subjunctive conjugation of the future, which necessarily demands auxiliary verbs to refer to. As a result, these words can also join together to form complex semantics, sometimes complicating the translation of an Arabic word or sentence into other languages. Homonymy and polysemy are among the most common problems that complicate the process of translating Arabic, particularly in literature. These two issues depend on the context to distinguish individual meanings and intentions. It is likely that the translator will always favor one meaning at the expense of the others. Thus, this may lead to the presentation of an obscure simplification of the meaning of the original text, consequently losing the deep secret that the author wants to transmit to the reader. [14]

4.2. Cultural Nuances

Arabic is deeply conceptualized in its cultural, historical, social, and religious backgrounds. As with all languages, many nuances can only be understood with prior knowledge of these intricacies. In the case of translating cultural references and idiomatic expressions, translators will most likely opt to translate the meaning of the expression rather than the form. Translating a cultural reference so that the exact equivalent in the target language means nothing to the target readers might be catastrophic. A translator should never underestimate the historical, political, social, and cultural context in which the text is conceived. This may not necessarily help in conveying the core or implicit meaning of the expression, but it will provide a sense of the time and history that shaped the work that is being translated. [15]

Conscious awareness and learning to change the lens of thought altogether is fundamental to understanding the phenomenon of culture and thus translation from one culture to another. Moreover, people from different cultural backgrounds understand the world through the preconceptions endowed by their linguistic and cultural experiences, and when encountering a different culture, failures in perceiving mentality will lead to miscommunication and subsequently misunderstanding of habits, expectations, values, and other aspects of cultural beliefs and norms. Arabic literary texts incorporate unique cultural concepts, social references, customs, local metaphors, and apparently untranslatable idiomatic expressions that do not have any semantic equivalents in English. [16]

4.3. Poetic and Prose Styles

Poetic and prose styles. Modern Arabic literature is an amalgamation of both poetry and prose, in which poetry has its peculiarities in construction and conveyance when compared to prose. This at times makes it difficult to translate, making

it close to impossible. Arabic poetic form is constructed based on rules of meter and a rhyme system. It is also based on imagery that obeys its own general and individual rules. Unloading an Arabic text into another language while keeping its metric form and its rules of construction is a major problem among translators. [17]

Arabic prose would be less problematic than poetry for the two languages. However, the dynamics of narrative construction, which most of the time deeply interrelate with the narrative themes, make it a challenge to translate. As in any literature, style plays an important role not only to convey ideas and emotion but also as a meaning-conveying vehicle. In other words, that which is being said is intricately interwoven with how it is being said. This reality creates a problem that no translation, with its various tools of equivalents, can simply convey what the author has brought into his work. Translation – where it can be done – is at best an approximation of not only the author's language but of his voice as it lands on the tone of his works, a unique amalgamation evolved by the author with time, experience, and life. When the narrator's voice is a character of its own, the problem can become even more complex. [18]

Translating poetry from one language to another, or even from one poet to another, or the mere act of translating novels, short stories, or plays from Arabic into English or from any other language into Arabic is not the same as translating simple documents. This process is not like translating the news. For a translator to successfully carry the original poet's ideas through his own language, a thorough literary work should morally be taken into account. It is to be stated that a professionally trained translator in one language is more likely to contribute to the literature and, as such, must know his source language and target language perfectly if he is to produce high-caliber translations. Specialists could, with some sense of reliability, pick up, catch, or reproduce a faint echo of the original author's voice. Translators who undergo training in translating literary writing usually internalize the goal of the act of preparing a translation in every detail, down to the meticulous analysis of the structure of an Arabic sentence.

5. CURRENT APPROACHES AND TECHNOLOGIES

The difficulties of translating Arabic literary texts encompass a wide variety of linguistic and cultural factors. To this end, several technology-based systems have been proposed to deal with Arabic, similar to ongoing work in other languages. However, these are primarily concerned with solving more generic aspects of language comprehension and are directed, in context, at translators in the field. Current approaches in Arabic translation potentially operate a variety of methodologies and tools, from traditional orientalist principles to the leading use of computer-assisted machine translation. This has resulted in the development of a wide variety of tools designed to enhance human activity or replicate their work. At the lower end, examples of this tool include computer-assisted translation technologies, which are traditionally occupied by translation memory systems or suggestions to routinely translate into a given language supported by examples from existing texts or their own previous translation records. [19]

It is true, then, that these systems merely aid the translation or initially originate with human input. However, the recent increase in technology-based machine translation stems from translation memory and alignment systems that use advanced rule-based or statistical and genetic language processing paradigms. With these systems, the impact of the translator is reduced from translation assister to human post-editor of the partially machine-interpreted text. Enhanced suggestions for technology will also tackle the critical needs of the translator as it creates a transition that is not only useful in context but also feasible to understand and process in detail. In fact, matching to align terms across large and complex documents is an interesting technical and practical challenge [20]. The role of translation professionals is another area of research. Professional translators have tried to embrace technology into their workflows for years and, often begrudgingly, increasingly use machine-aided processes, including, of course, machine translation. A general view, however, is that the quality of the translated output is inversely proportional to the extent to which machine-inserted quality control processes or technologies are prevalent. Translation studies have just started to systematically consider the impacts of machine translation on translating overall. Some studies actually view this as a criticism of machine translation's overall capabilities. More consideration can actually be given to how the use of AI in translation can assist or constrain the ongoing developments in content specialization and the quality and speed of production. Some evidence has been seen in the practical application of AI-enhanced translation systems. Where the challenge of sport specialization, particularly language use within specific sport contexts and specific sport communities, has been shown to be aided by using these leading AI techniques when appropriately adopted and managed. [21]

6. CASE STUDIES

- Case Study 1: Shafiq Habib's Kolaha Akher Marrah: Revising a Partial Human Transduction Model with Deep Learning. What this resource does particularly well is its explanation of the linguistic structure of the input language as it pertains to the approach, and how it is used to frame the output from a linguistic perspective. The main impediments to the hand-crafted derivational translation model are idiomatic strings and divergent cultural and social assumptions, but the testimony explains more about idiomatic language and brings in other cultural assumptions that cannot be translated. The practice of establishing the output first, given the translation goals and the principle of revising the output in the absence of real translations between the variety of Arabic and English, reads like theory

application, which is reflected in the acknowledgment of reliance on many translation and encoding theories and a general hesitance to claim a particular theoretical approach. The idempotent and human-centered method of applications, of rewriting and revising, is clear in the discussion of repeating the process of producing seminal and heuristic utterances to fit the length of the input, integrating additional information one step at a time, and the three-pass revision in particular. They might also turn to some poetic forms and conventions in either language and are appealed to by the translation theories that anticipate such revision. When asked to discuss translations that do not have human 1:1 correspondences, they rely on the distinction between revising into an idiomatic form and making a transparent link to the practice of rewriting. [22]

- Case Study 2: Algorithmic and Acoustic Translation in iShakhsah, an Interactive Multimedia Exhibition. iShakhsah used two sources for text: SMS-based discussions of marriage on Yemen's first Islamic reality TV show, as well as poetry submitted by the public both for and against this TV show. Texts were translated into English and then back to Arabic by program partners for both meanings and echoes, and discussed by the director and translator, who always agreed. This practice led to the authenticity of the system's message for the desired emotion to be discussed, while sometimes falling into traps where controversial words were defined to specific ends, as opposed to maintaining the political neutrality of the source. Although the system could distinguish this to some effect, the authors sometimes wrote with more confidence than the translation might even imply, based not on the raw output, but on understanding the typical translation strategies undertaken, and were more confident in the whole when the document picked out and suggested its own keywords. When it did, we checked if we could agree with them; more often than not, we did. [23]

7. Future Directions and Research Opportunities

Without doubt, the advancement in AI and the emerging approaches and techniques related to AI are great potential areas for the future of the Arabic literary translation field. To this end, here are some future directions and research potential areas that might be tapped in the near future. - The creation and use of the Arabic Literary Corpus - A special issue or a series of workshops on Arabic Literature and AI - Encouraging and conducting more interdisciplinary research to exploit the potential of blending AI technologies, literature, linguistics, cultural

studies, philology, and translation. - The investigation of the application of AI in relaying cultures from east to west and from west to east. - Focusing on showcasing the shifts in the Arabic literary journal translation over the time when AI has become a norm in different fields. - Stimulating AI to follow the trends in the latest styles of collaborative literary translation and new cultural trends in digital translation such as machine translation between writers, interactive literary translation into several languages through crowd-sourcing platforms, or storytelling translation. - Postcolonial studies should be applied more in terms of AI in translation, exploring the voices of different national and linguistic cultural translation journals in various publishing houses and Translation Quarterly, and perhaps from the Global South or other marginal or orphan publications. - One of the novelties to be expected in the field of literary translation is that researchers in translation studies can reach an agreement with the AI team to feed articles published in Arabic translation journals or journals interested in the translation of Arabic literature and to investigate additional software for machine translation developed by technological companies. - The organization of a specialized workshop in academia, technology companies, and digital platforms to explore the extent to which published and translated literature, and the pleasures of writers, translators, editors, academics, and readers, can benefit from the capabilities of software. To conclude, an inclusive vision is highly recommended for Arabic literary translation in the Arab translation journals in order to feed the AI tools available to avoid a "Western" hegemonic outlook legacy that tends to assign sovereignty and significance to one's self or, in other words, to whose literature is ahead in the Global North. Also, academia should partner with technology industries and the market to envision digital trends that might materialize in the future and to subscribe to the most optimal digital and technological conditions that must be met in terms of the quality of the new and up-and-coming technologies in the field of translated literary studies.

8. Conclusion

In conclusion, despite the advancements in artificial intelligence technology, translating Arabic literary texts still poses significant challenges that require further research and development.

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