

Beyond Literal Meaning: Neural Machine Translation Constraints in Translating the Poetic Depth of Al-Mutanabbi's "Tell My Beloved"

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Abstract

This study examines the limitations of neural machine translation (NMT) in the context of literary translation, using a comparative analysis of a Google Translate version and a human translation of the renowned Arab poet Al-Mutanabbi's poem "Tell My Beloved." By juxtaposing these two renditions, the research aims to elucidate the challenges that current NMT technology faces in effectively capturing the nuanced expressiveness, cultural subtleties, and aesthetic qualities inherent in literary works. The analysis reveals that while NMT models excel at conveying the literal, denotative meaning of the text, they often struggle to replicate the poetic sensibility, contextual understanding, and interpretive depth required for the translation of seminal works of poetry. The findings underscore the continued importance of human expertise and creative intervention in the translation of literary texts, even as NMT technologies continue to advance. This study contributes to the ongoing academic discourse surrounding the role of artificial intelligence in the field of literary translation and the limitations of machine translation in preserving the richness and integrity of the original work.

Keywords: Al-Mutanabbi- neural machine translation (NMT) - long/ short-term memory (LSTMs) - gated recurrent units (GRUs) – Google translate- language models.

1. Introduction

Neural machine translation (NMT) is a powerful approach to automated language translation that has revolutionized the field in recent years. Unlike traditional statistical machine translation (SMT) methods, which rely on complex rule-based systems and phrase-based models, NMT leverages the power of deep neural networks to learn the underlying patterns and relationships between languages. One of the key advantages of NMT is its ability to capture contextual information and handle long-range dependencies, enabling it to produce more coherent and accurate translations. Additionally, NMT models can be fine-tuned for specific domains or specialized tasks, further improving their performance in real-world applications. Stahlberg (2020) argues that "contextualized representations do not only depend on the word itself but on the entire input sentence. Thus, they cannot be described by a single embedding matrix but are usually generated by neural sequence models which have been trained under a language model objective" (345).

As the field of artificial intelligence and deep learning continues to advance, NMT is poised to play an ever-increasing role in breaking down language barriers and facilitating global communication. With ongoing research into multilingual models, low-resource language translation, and more, the future of neural machine translation is bright, promising to make high-quality translation accessible to people around the world. Neural machine translation (NMT) is a revolutionary approach to automated language translation that leverages the power of deep learning and artificial neural networks. Unlike traditional statistical machine translation (SMT) methods, which relied on complex rule-based systems and phrase-based models, NMT has transformed the field by learning to translate directly from data. Koehn (2020) points out that

Within a year or two, the entire research field of machine translation went neural. To give some indication of the speed of change: ... only one pure neural machine translation system was submitted in 2015. It was competitive but underperformed traditional statistical systems. A year later in 2016, a neural machine translation system won in all language pairs. In 2017, almost all submissions were neural machine translation systems. (40).

At the core of NMT are recurrent neural networks (RNNs), such as long/ short-term memory (LSTMs) and gated recurrent units (GRUs), as well as more recently developed transformer models. These neural architectures are trained on vast amounts of parallel text data, allowing them to develop a deep understanding of the semantic and syntactic structures of different languages. By encoding the source text into a dense, numerical representation and then decoding it into the target language, NMT models can generate fluent, human-like translations that often surpass the quality of previous approaches. One of the key advantages of NMT is its ability to capture contextual information and handle long-range dependencies, enabling it to produce more coherent and accurate translations. Additionally, NMT models can be fine-tuned for specific domains or specialized tasks, further improving their performance in real-world applications, such as in the fields of healthcare, finance, or legal translation. (Datta & David 2020:1396)

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However, the rise of neural machine translation (NMT) has introduced new possibilities for translating literature. NMT models, powered by deep neural networks, have demonstrated a remarkable ability to handle the subtleties and contextual complexities inherent in literary language. One of the key advantages of NMT for literary translation is its capacity to learn and represent the deeper semantic and syntactic relationships between words and phrases. Traditional SMT systems often struggle with ambiguity and idiomatic expressions, whereas NMT models can better navigate these linguistic challenges by drawing upon their broader understanding of

language. Furthermore, NMT models can be fine-tuned and specialized for particular domains, including the translation of poetry, novels, and other literary genres. By training on large corpora of high-quality literary translations, NMT systems can develop a more nuanced appreciation for the rhythms, imagery, and emotional resonance of literary language. This enhanced sensitivity to literary style and thematic content has the potential to revolutionize the field of literary translation. NMT-powered tools could assist human translators by providing more accurate and contextually appropriate suggestions, or even generate first drafts that human translators can refine and polish. NMT “not only focuses on the word it wishes to translate, but also looks at the words that appear before and after.” (Cullen 2020)

It is important to note that the translation of literature will likely always require a human touch. The creative and interpretive aspects of literary translation, such as preserving the author's voice and capturing the cultural subtleties, may never be fully replicated by machines. As such, NMT should be viewed as a powerful augmentation to the work of human translators, rather than a replacement for their expertise and artistry. The translation of literary works poses unique challenges that have traditionally pushed the boundaries of machine translation capabilities. Unlike technical or factual texts, literary works often rely on nuanced language, complex metaphors, and cultural references that can be difficult for rule-based or statistical machine translation (SMT) systems to accurately capture. As statistical machine translation (SMT) can be defined as “a machine translation paradigm that relies on statistical models learned from parallel text corpora and decoding algorithms to automatically translate one natural language into another”, it fails to correctly capture the literary meaning. (Zhang&Xiong 2020: 2)

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The present study aims to investigate the capabilities and limitations of neural machine translation (NMT) in the context of literary translation. To this end, the research will undertake a comparative analysis of two distinct human translations of a literary work alongside a machine-generated translation produced by Google Translate. By juxtaposing these three renditions, the study intends to shed light on the strengths and weaknesses of NMT models in capturing the nuances and complexities inherent in literary language. Through a detailed examination of factors such as semantic accuracy, syntactic structure, preservation of stylistic elements, and overall translation quality, the research will provide valuable insights into the current state of NMT technology and its potential impact on the field of literary translation. Applying neural machine translation (NMT) models to a literary work is indeed the challenging mission that represents the ground upon which this study stands. For the purposes of the present study, the researcher has selected the poem "Tell My Beloved", "أبلغ عزيزاً في ثنبا القلب منزله", which is attributed to the renowned Arab poet Al-Mutanabbi, as the primary text of analysis.

Al-Mutanabbi (915-965) is widely regarded as one of the greatest and most influential poets in the Arabic literary tradition. Hailing from the town of Kufa in modern-day Iraq, Al-Mutanabbi's poetic genius emerged at a young age, and he soon gained a reputation for his mastery of the Arabic language and his ability to craft verses of unparalleled eloquence and sophistication. Al-Mutanabbi's poetry is marked by its deep engagement with themes of power, leadership, love and lamenting the death of dear ones. His works often celebrated the achievements of powerful rulers and commanders, but they also delved into more philosophical and introspective realms, dealing with questions of morality, the transience of life, and the nature of human existence. His command of the Arabic language was unsurpassed, and his poems were characterized by their complex metaphors, vivid imagery, and complex rhyme schemes. He could be considered as the most "celebrated" poets of his age that he himself

would have to acknowledge that time has given him his due. Few, if any, Arab poets' work has survived to be celebrated so long and by so many as the work of this tenth-century poet, generally acknowledged to be the last of the great poets in the classical Arabic tradition, and considered by some to be the greatest Arab poet. (Larkin 2012: 5)

Despite facing political and social upheaval during his lifetime, Al-Mutanabbi's poetic legacy endured, and his works continue to be studied, recited, and revered by Arabic-speaking communities worldwide. He remains a towering figure in the annals of Arab literary history, whose influence can be seen in the works of countless subsequent poets and writers. Al-Mutanabbi's poetic style was defined by its remarkable complexity and sophistication. His verses were renowned for their elaborate rhyme schemes, often employing a variety of metrical patterns and structural devices that displayed his mastery of the Arabic poetic tradition. The depth and nuance of his language were equally striking, with Al-Mutanabbi skillfully weaving together layers of metaphor, allusion, and philosophical contemplation.

One of the trademarks of Al-Mutanabbi's poetry was its emphasis on themes of power, leadership, and the heroic individual. Many of his poems celebrated the exploits and virtues of powerful rulers and military commanders, elevating their deeds through the use of grandiose, panegyric language. At the same time, his works also grappled with more universal questions of human nature, mortality, and the pursuit of glory and recognition. Beyond its thematic complexity, Al-Mutanabbi's poetry was also renowned for its vivid imagery and sensory evocations. His verses often painted vivid word-pictures, transporting the reader to the bustling courts of kings or the stark landscapes of the Arabian desert. This keen eye for detail and mastery of descriptive language contributed to the enduring popularity and impact of his poetic oeuvre. (Larkin 2012:40)

In order to examine the nuances and complexities inherent in the translation of such a seminal literary work, the research will compare a human translation of the poem produced by an Arab translator against a machine-generated version produced by the Google Translate platform. By juxtaposing these two versions, the study aims to elucidate the limitations and challenges of neural machine translation (NMT) models in effectively capturing the semantic, syntactic, and cultural subtleties that are intrinsic to Al-Mutanabbi's poetic style and thematic content. Through a detailed comparative analysis, the research will shed light on the extent to which NMT

technology, despite its remarkable advancements, may fall short in preserving the nuanced beauty and profound meaning of this celebrated work of Arabic literature:

أبلغ عزيزاً في ثنايا القلب منزله
أنني وإن كنت لا ألقاه ألقاه
وإن طرفي موصول برويته
وإن تباعد عن سكنائي سكناه
يا لبيته يعلم أنني لست أذكره
وكيف أذكره إذ لست أنساه
يا من توهم أنني لست أذكره
والله يعلم أنني لست أنساه
إن غاب عني فالروح مسكنه
من يسكن الروح كيف القلب ينساه؟

The Google Translate version of the poem demonstrates both the strengths and limitations of current NMT technology. On the one hand, the translation accurately conveys the overall meaning and narrative arc of the original Arabic text. Key themes, such as the poet's longing for his beloved, the paradoxical nature of remembering and forgetting, and the intimate connection between the soul and the heart, are all successfully captured. On the other hand, "a problem experienced here, ... is the accuracy of context-based word selection. The inaccuracy in word selection can result in a shift of meaning, both at the micro level (invert), namely in the level of words or phrase and macro (convert) or in the level of wider context, namely meaning as a whole". (Sutrisno 2020: 563). However, the Google Translate version also reveals the challenges that NMT models face when tasked with translating complex, nuanced literary works. The language lacks the poetic elegance and rhythm of the original, and there are instances where the translation appears overly literal or awkward, such as the line "My limbs are connected to his vision." This suggests that while NMT has made remarkable strides in improving the fluency and coherence of machine translation, it still struggles to fully replicate the artistry and subtlety of human-crafted literary translations:

Tell someone dear in the depths of the heart his home
Even if I cannot meet him, I will meet him
My limbs are connected to his vision
Even if he is far from my residence, he remains inhabited
I wish he knew that I don't remember him
How can I remember him if I do not forget him?
Oh you who thought that I didn't remember him

God knows that I will not forget him
If he is absent from me, the soul is his abode
Who lives in the soul, how can the heart forget him?

In contrast, the human translation provides a deeper understanding of the cultural and linguistic context of the poem, as well as a more refined sense of poetic sensibility. The choice of words and phrasing more effectively captures the emotional resonance and metaphorical richness of Al-Mutanabbi's original verses. This human-generated translation highlights the continued importance of human expertise and creativity in preserving the nuances and complexities of literary works, even as NMT technologies continue to advance:

Tell my dear beloved who lives in the
chambers of my heart,
That even if I don't meet him, I still meet him
And that my sight is connected to seeing him...
Even if our dwellings are far away from one another
I hope he realizes that I don't remember him
As how can I remember him if I can't forget him in the first place?
O you who thought that I don't remember him
And God knows that I never forget about him
If he is away from me, my soul is his home
So how possibly could the heart forget who lives in the soul?

The comparative analysis of these two translations underscores the limitations of current NMT models in the realm of literary translation. Its translation lacks the poetic qualities and nuances present in the original Arabic verses. The limitations of the NMT approach become evident through several key factors. Firstly, the source verses possess a melodic rhyme scheme and rhythmic patterning which is completely lost in the prose-like NMT translation. Secondly, Al-Mutanabbi employs powerful stylistic literary devices such as parallelism and the conceit of the beloved dwelling within the poet's heart as symbols of deep longing, but these techniques fail to come across in the straightforward NMT output. Moreover, vivid poetic descriptions containing layered imagery and symbolism, like "تثايب القلب" (folds/depths of the heart), are oversimplified and reduced to more basic phrases by the NMT, stripping away their rich connotative meaning.

6

Additionally, there are instances of inconsistent word choices by the NMT system, such as translating "طرفي" as "my limbs" instead of the more contextually appropriate "my eyes", in reference to the poet's gaze being connected to the beloved's vision. It is argued that "under low resource conditions, neural machine translation produces fluent output unrelated to the input" (Koehn 2020: 297). Fundamentally, the natural rhythmic flow and cadence so crucial to poetic

expression is entirely absent from the NMT's rigid, prose-like rendering of the verses. While providing a literal semantic translation, the neural machine approach falls short in preserving the literary artistry, rhetorical techniques, metaphorical depth, and rhythmic musicality that characterize Al-Mutanabbi's masterful Arabic poetry.

As of the fifth line of the poem, the stark differences between the neural machine translation (NMT) and human translation versions become glaringly apparent when analyzing the Arabic poetic verses side-by-side. While the NMT output provides an accurate rendering of the literal semantic meaning, it is essentially prosaic and devoid of the artistic qualities that make the original Arabic poetry so evocative and impactful. In contrast, the human translator demonstrates a masterful linguistic dexterity and creativity in faithfully re-creating the literary experience of the verses in English.

The poetic devices like metaphorical imagery, parallelism, and plaintive tone are skillfully preserved in the human version through careful word choices, phrasing, and stylistic techniques. By opening with the culturally emblematic Arabic exclamation "Ya laitahu..." and infusing the English lines with a wistful, yearning voice akin to the original poet's, the human translator imbues the work with a sense of the Arabic literary tradition that the NMT inevitably cannot capture. While functional for straightforward text, the NMT's mechanical limitations become evident when confronted with the nuanced rhetorical artistry and emotional depth of classical poetry - elements that require a human translator's perspicacity and aesthetic sensibility to be properly conveyed into another language whilst retaining the inherent beauty and soul of the source material.

When comparing the neural machine translation (NMT) version by Google Translate to the human translation of Al-Mutanabbi's verses, we can analyze the limitations of current NMT models like recurrent neural networks (RNNs), long short-term memory (LSTMs), and gated recurrent units (GRUs) in handling literary translation. Long short-term memory (LSTM) for example "has transformed both machine learning and neurocomputing fields...One reason for the success of this recurrent network lies in its ability to handle the exploding/vanishing gradient problem, which stands as a difficult issue to be circumvented when training recurrent or very deep neural networks." (Houdt,Mosquera&Napoles 2020:5929). However, it has its own limitations when it comes to literature and literary translation.

RNNs, including LSTMs and GRUs, are sequence models well-suited for processing sequential data like text. However, their performance can falter when it comes to capturing the higher-level poetic qualities present in Al-Mutanabbi's work. It is also noteworthy that GRUs can be defined as "a simplified alternative to LSTMs. GRUs combine the input and forget gates into a single update gate and use a reset gate to control the flow of information." (Becker 2024:37). Though GRUs are also known as more efficient than LSTMs, but again in literary expressions, the model is not as accurate as human translation, for instance:

1. Rhyme and Rhythm While RNNs can potentially learn patterns by processing text sequences, preserving an underlying rhyme scheme and rhythmic flow, as the human translator did, remains a significant challenge. The NMT output completely loses the musical rhyming of the original Arabic.

2. **Literary Devices Techniques** like metaphor, parallelism, and personification are deeply ingrained in the art of poetry. While RNNs can pick up on some of these through pattern recognition, fully comprehending and generating figurative language remains an area where human cognition and creativity excel.

3. **Word Nuance** RNNs operate on word embedding - distributed representations of words based on context. However, capturing the layered connotations, cultural context, and imagery invoked by evocative word choices like "soul is his home" in the original is extremely complex for these models.

4. **Long-Range Dependencies** Poetry often employs long-range structural dependencies across lines/verses. While architectures like LSTMs aim to handle long sequences better, accurately retaining such long-range dependencies and coherently rendering them proves difficult.

5. **Subjective Elements** Poetry is infused with subjectivity, emotion, and artistic expression which stem from human experience and creativity. For an NMT model trained purely on data to authentically replicate elements like voice, tone, and spirit remains an open challenge.

While RNN-based NMT has significantly advanced machine translation capabilities, it still struggles to replicate the full artistic mastery and human nuance required for literary translation of poetic masterworks. As AI architectures evolve to better handle abstraction, pragmatics, and creativity, their translation of art forms like poetry may improve. But currently, human linguistic expertise remains indispensable for preserving the soul of literary works across languages and cultures. In contrast, the human-generated translation demonstrates a deeper understanding of these linguistic and cultural intricacies. The translator's familiarity with the poetic conventions of the Arabic literary canon is evident in the carefully selected word choices and the preservation of the original's rhythmic flow and emotive resonance. This suggests that while NMT models excel at capturing the literal, denotative meaning of text, they often struggle to convey the connotative, aesthetic, and cultural dimensions that are integral to literary expression. The assessment of NMT performance has traditionally relied on standard evaluation metrics such as BLEU (Bilingual Evaluation Understudy) and METEOR (Metric for Evaluation of Translation with Explicit Ordering). These metrics, while useful for assessing the overall quality of machine translations, may not effectively capture the nuanced, aesthetic, and interpretive qualities that are crucial to the assessment of literary translation.

The BLEU metric, for example, primarily focuses on the similarity between the machine translation and one or more reference translations, based on n-gram overlap. While this approach can be helpful in evaluating the grammatical correctness and fluency of a translation, it falls short in assessing the more subjective and context-dependent aspects of literary translation, such as the preservation of the original's emotional resonance, stylistic flair, and cultural relevance. Similarly, the METEOR metric, which considers both lexical and semantic similarity between the machine translation and reference texts, may still struggle to fully capture the nuanced, meaning-based translation required for poetry and other literary genres. The inherent complexity and ambiguity of literary language often defy straightforward, word-for-word comparison,

rendering these standard evaluation metrics less effective in assessing the success of NMT in the realm of literary translation. (Al-Rukban & Saudagar 2017:230)

The limitations of these evaluation metrics are particularly evident in the comparison of the Google Translate and human translations of the *Al-Mutanabbi* poem. While the machine translation may score well on metrics like BLEU or METEOR, due to its overall grammatical and semantic accuracy, it falls short in preserving the poem's poetic sensibility, cultural references, and emotional resonance – aspects that are crucial to the appreciation and evaluation of literary works, but not adequately captured by the current standard evaluation frameworks. To address this gap, the proposed paper suggests the need for the development of specialized evaluation frameworks that can more accurately measure the success of NMT in translating literary works. These frameworks could incorporate a deeper understanding of literary conventions, rhetorical devices, and cultural context, as well as the ability to assess the aesthetic and interpretive qualities of the translated text. By expanding the scope of NMT evaluation beyond the limitations of generic metrics, researchers and practitioners can better understand the capabilities and shortcomings of machine translation in the realm of literary translation.

The standard Seq2Seq model for NMT is primarily designed to translate text in a linear, word-by-word fashion, relying on the encoder-decoder structure to map the source language to the target language. However, this approach often struggles to capture the holistic, meaning-based translation required for poetry and other literary works. In the case of the Google Translate version of the *Al-Mutanabbi* poem, we can see evidence of this limitation. For example, the line "My limbs are connected to his vision" is a relatively literal translation that fails to fully convey the metaphorical and emotive qualities of the original Arabic verse. The Seq2Seq model, focused on translating individual words and phrases, is unable to grasp the deeper, symbolic meaning underlying the poet's words. Moreover, the translation of the lines "I wish he knew that I don't remember him / How can I remember him if I do not forget him?" exhibits a similar word-for-word approach that struggles to capture the nuanced interplay of remembering and forgetting expressed in the original. The Seq2Seq model's linear processing of the text is unable to fully represent the paradoxical nature of the poet's sentiments. (Sriram 2017:24)

A key limitation of current NMT systems is the reliance on predominant language models that are trained on general-purpose corpora, rather than specialized datasets focused on literary works and their translations. This mismatch between the training data and the unique linguistic and cultural features of poetry and other literary genres can result in NMT models struggling to effectively capture the nuances and complexities inherent in such texts. In the case of the Google Translate version of the *Al-Mutanabbi* poem, we can see evidence of this limitation. The machine translation, while reasonably accurate in conveying the overall meaning, often fails to replicate the poetic devices, cultural references, and rhetorical flourishes that are essential to the original Arabic text. For instance, the line "Oh you who thought that I didn't remember him" lacks the emotional weight and implicit meaning that a human translator, drawing upon their understanding of Arabic literary traditions, would be able to convey.

Likewise, the machine translation's rendering of lines like "If he is absent from me, the soul is his abode" and "Who lives in the soul, how can the heart forget him?" suggests a lack of familiarity with the symbolic and metaphysical associations common in Arabic poetry. Without

specialized training on a curated corpus of literary works and their translations, the NMT model is unable to fully appreciate the deeper cultural and thematic significance embedded within the original poem. In contrast, the human translation demonstrates a refined understanding of the literary conventions and cultural references at play, allowing for a more nuanced and expressive rendering of the text. This points to the potential benefits of developing NMT models trained on large, specialized datasets of literary works and their high-quality human translations.

By revealing NMT systems to a diverse range of poetic and literary texts, along with the expert translations produced by human translators, the models could develop a more sophisticated grasp of the linguistic, stylistic, and cultural elements that are essential to the translation of literary works. This specialized training could equip NMT models with the necessary knowledge and sensitivity to better capture the subtleties and complexities that often elude translation systems trained on more general language corpora. Eventually, the comparative analysis of the Google Translate and human translations of the Al-Mutanabbi poem highlights the need for NMT systems to move beyond generic language models and towards the development of specialized, literature-focused models that can more effectively preserve the richness and integrity of poetic and literary works in translation. Moreover, "The comparison of machine translation with human translation can be carried out at different linguistic levels, such as vocabulary, syntax, semantics, and pragmatics. Of course, the extent of the edition depends on the genre of the texts as well. For example, scientific texts enjoy less lexical variation than literary texts. In other words, the number of polysemous lexical items in literary texts is much greater than the other texts requiring thus a greater amount of editing." (Bonyadi 2020: 90)

2. Conclusion

The human translation is better able to convey the holistic, meaning-based interpretation of the poem. The translator's understanding of the cultural and literary context allows for a more fluid and expressive rendition that preserves the emotional resonance and metaphorical richness of the original. This suggests that the translation of poetry and other literary works requires a more holistic, meaning-centered approach that goes beyond the limitations of the Seq2Seq architecture. By acknowledging the shortcomings of the linear, word-by-word translation approach inherent in Seq2Seq models, the proposed paper can highlight the need for more advanced NMT architectures and training strategies that are better equipped to handle the complexities of literary translation. This analysis can contribute to the ongoing efforts to develop NMT systems that can more effectively capture the nuanced, meaning-based translation required for the appreciation of poetic and literary works.

This study's comparative analysis of a Google Translate version and a human translation of the renowned Arab poet Al-Mutanabbi's poem "Tell My Beloved" has illuminated the significant limitations of current neural machine translation (NMT) technology in the context of literary translation. The findings reveal that while NMT models excel at conveying the literal, denotative meaning of the text, they often struggle to capture the nuanced expressiveness, cultural subtleties, and aesthetic qualities that are integral to the appreciation of literary works.

The paper's examination of the Seq2Seq architecture's linear, word-by-word approach, the lack of specialized language models trained on literary corpora, and the inadequacies of standard evaluation metrics highlights the inherent challenges NMT faces when translating complex, context-dependent poetic language. These limitations underscore the continued importance of human expertise and creative intervention in preserving the richness and integrity of literary expression, even as machine translation technologies continue to advance. By addressing these theoretical and practical constraints, the study contributes to the ongoing discourse surrounding the role of artificial intelligence in the field of literary translation and the need for more specialized NMT frameworks capable of accurately rendering the artistry and cultural resonance of seminal works of poetry and literature.

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