

## **Translating Literature Using Machine Translation: Is It Really Possible?**

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**Abstract:** The purpose of this paper is to review research regarding the possibilities of using machine translation in order to translate literary texts. Based on previous research, the paper will look at problems that were identified, related to the lexical, structural and pragmatic levels, analysing reasons for these errors. The paper will draw a comparison between machine translation and human translation in terms of cognitive understanding and accuracy of interpretation of literary texts. Features of literary texts will also be taken into account in order to draw the appropriate conclusions of human and machine translator possibilities of understanding these texts.

**Keywords:** pragmatics, cognition, context, cohesion

### **1. Introduction: The Pragmatics Level**

When translating a text, we should not stop only at the level of the text itself. We do not translate words and sentences alone. Instead, we need to understand background knowledge, such as the domain to which the respective text belongs, in order to choose the right terms, for example. We need knowledge of the context, as well as cognitive and interpretive abilities in order to grasp the meaning of any sentence and of any text. For a conversation, we deal with the same situation, as we need to understand its subtleties, through understanding the implied meaning judging from the context, for instance This statement holds true both for human translator, as well as for machine translation.

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In fact, any text that is read is always connected to an interpretation, as language is not used only for describing what is going on. Instead, language is also inseparable from culture, meaning from a mindset that it also expresses:

Language [...] is used not simply to report events in the world. It is also used to convey the rich mental models that individuals and cultures bring to bear on the communication process. It is the claim of a pragmatics-based approach that texts do not have meanings, but rather that in producing texts, people intend meanings. Thus, a text can only be approached through an interpretation. (Farwell and Helmreich 2003: 2)

The importance of pragmatics is related to understanding how words and sentences are used, as well as to interpreting what is being said by taking into account the particular situation of communication. The pragmatics level of language can be considered crucial for both an accurate understanding of the text, as well as an accurate translation of it. Apparently, pragmatic competence, which refers to the ability of identifying such aspects in a text or in a conversation, is an attribute of a human translator only. However, significant developments have been done in the field of machine translation, and pragmatics have been integrated as additional abilities of machine translation. As a result, issues significant for machine translation are solving ambiguities and choosing appropriate structural analyses, as well as pragmatics (Rothkegel 1986):

Rothkegel attempted a solution through the TEXAN system to find an equivalent for the attributes of a human translator. Rothkegel proposed the text acts ("speech acts in which texts are produced. When we translate, we are producing a new text"), believing that the "system needs a linguistic model in which content, function and form of linguistic expressions in a text are connected."

As Google Translate has become inevitable in foreign language learners' efforts to do assigned work, and machine translation is all around us, even in Google Chrome as it offers automatic translation of web pages, as well as mobile phone applications that can translate on the spot a spoken conversation (Ducar and Shocket 2018: 780), more and more questions come from the users, as they wonder what makes sometimes automatic translation to go wrong. Perhaps the best solution remains for human translators to use machine translation as a helper, as they will need to correct the automatic translation afterwards.

The field where translation is done also needs special attention. While it may be easier for machine translation to deal with technical and scientific terms, once the software is properly instructed, it may be more difficult for automatic translation to deal with texts from the field of literature, such as fiction, prose, and poetry. Such texts can require additional work to be properly understood, as they use figurative language, and pose problems even to human translators.

### **1.1. Above the Sentence Level**

Research has been done in the field of machine translation regarding their need to focus above the level of the sentence. Meaning should be the focus, instead of just the grammatical form. In light of these considerations, Voigt and Jurafsky (2012: 18) draw attention to "the role of textual features above the sentence level in advancing the machine translation of literature". Eugene Nida (1969) focuses on two concepts presented in oppositions regarding an efficient translation: "formal equivalence" and "dynamic equivalence". Formal equivalence refers to the level of grammatical form, while dynamic equivalence refers to accurately rendering the meaning in the translated text. In Voigt and Jurafsky's (2012: 18) words, any translator should know how "to differentiate between translations aiming to replicate the form of their source and those aiming to replicate the source text's effects on its readers". The readers can be sensitive to the results of the translated texts, which they judge in terms of whether the translated texts offer them what they expect or not.

### **1.2. Cohesion**

One important element to preserve in any translation is cohesion. The term refers to "the ways in which the components of the textual world, i.e., the configuration of concepts and relations which underlie the surface text, are mutually accessible and relevant." (Beaugrande and Dressler 1981: 3) It can help the translated text sound as natural as the source text: "Cohesion considers the limited human capacity for storing the 'surface materials' of a text long enough to relate them semantically during the act of reading" (Voigt and Jurafsky 2012: 19). The text should flow in a usual way, in order to sound convincing. We need, for authenticity reasons, to preserve "referential cohesion (Halliday and Hasan 1976), the relation between co-referring entities in a narrative" (Voigt and Jurafsky 2012: 19) in the translated text.

With respect to different types of texts, cohesion can be more important. In the case of literary texts, "given stylistic considerations and their fundamental narrative function, prose literary texts are inherently 'more cohesive' than news." As a result, they may pose more difficulties for machine translation systems that are "built with newswire texts in mind" (Voigt and Jurafsky 2012: 19).

## **2. Towards Pragmatic Models**

The change towards pragmatic models for automatic translation came with the Pangloss system (1994), which, however, could only create a semantic representation of the text (Farwell and Helmreich 2003):

The Microcosmos MT engine [...] monitors and uses information about speakers and hearers, discourse structure, and world knowledge in constructing its interlingual representation of an input text (Attardo 1994, Carlson & Nirenburg 1990). It can handle metonymic constructions and metaphors (Onyshkevych & Nirenburg 1994).

[...] contextual information and world knowledge are both represented and used inferentially [...] (Farwell and Helmreich 2003)

Efforts have thus been made to create artificial intelligence systems for translations that can imitate the cognition and pragmatic skills of human translators. Knowledge of the world has also been included, which is an important element in creating accurate translations. Figurative language especially requires background knowledge, as anyone needs life experience and previous readings in order to understand the references.

Pragmatic MT systems followed in a later development, where construction of beliefs, reasoning and metaphors were created:

Such system models can be found in the work on ViewGen (Ballim & Wilks 1991), a system which constructs beliefs spaces for any number of agents about any number of topics. In addition, we find a computational basis for the required inferencing in the work associated the ATT-Meta system (Barnden *et al.* 1994). This system includes a default inference mechanism, an epistemic logic involving four possible positive truth conditions (certain, default, probable, and possible), a truth maintenance system, metaphorical pretense cocoons (for treating metaphors as true), and simulative reasoning (for inferencing within embedded belief states). (Farwell and Helmreich 2003)

Working with fiction texts can bring about difficulties regarding layers of meaning, such as “primary or central meaning, [...] literal meaning and [...] figurative meaning” (Nida and Taber 1960). Even if “the solutions proposed by Nida and Taber are excessively simple: remove the metaphor (paraphrasing it) or change it” (Arduini 2014: 43), it is still challenging for machine translation.

### **3. Fiction vs Non-Fiction Texts**

The results of two studies will be mentioned, regarding the difference in translating fiction vs non-fiction texts, in order to gain a perspective of the efficiency of machine translation.

The study by Salimi (2014) shows a comparison regarding the work of machine translation systems with fiction and non-fiction texts. The results of the study were the following:

MT systems struggle with long sentences, anaphora, ambiguity, among other things. The literary texts contained shorter sentences than the academic texts. Even so, the fictional texts scored 32.16, a higher BLEU score than the 27.75 score of the non-fictional texts. (Salimi 2014)

BLEU stands for the most widely-used automatic evaluation metric in machine translation. The difference between the scores is explained by fictional texts requiring “subjective interpretation”, and by non-fictional texts requiring “specific terminology” (Salimi 2014). Literary texts need, thus, more attention to the

pragmatics level: “Translating literature requires understanding the text beyond the meaning on a sentence level” (Salimi 2014). However, MT “is a great tool for professional translators to use along with post-editing, and for gisting” (Salimi 2014). The literary corpus study by Voigt and Jurafsky (2012) is also worth mentioning. Their corpus consists in twelve short stories compared to twelve news stories, for the processing of which they used “standard publicly-available NLP tools” (Voigt and Jurafsky 2012: 19). As results, they mentioned that “literary text uses more dense reference chains as a way of creating a higher level of cohesion.” (Voigt and Jurafsky 2012: 20). First they used Google translate, and then they “used the Lee et al. (2011) coreference system in Stanford CoreNLP [...] to evaluate cohesion on both the human and machine English translations.” (Voigt and Jurafsky 2012: 21).

These studies underline the difficulties encountered by machine translation in the literary field related to long sentences, ambiguity, anaphoric elements, as well as cohesion. The studies suggest that machine translations are not truly developed in the pragmatic competence area like human translators, and human translators need to correct the automatic translations.

#### **4. Literary translations and artificial intelligence**

An example of the efforts done in order to imitate the way the human mind works is Neural Machine Translation (NMT), launched in 2016. This model marks the “shift from statistical to neural machine translation (MT) systems”, which “has made MT a frequently used tool in the translation industry” (Zajdel 2019). The translations done by NMT are “much more fluent (Bentivogli et al., 2016) and also less literal.” (Toral et al 2020). NMT is “based on the model of neurons in the human brain, the network allows the system to make important contextual connections between words and phrases.” (Cullen 2020)

Cullen (2020) gives the example of the translation of “To thine own self be true” from Shakespeare’s *Hamlet* using NMT, using a string of numbers which will enter the neural network: “These numbers are then decoded into the target language: ‘Zu dir selber treu sein’.”

Since NMT “begins to analyse context”, it “can successfully translate literature”. The advantage is that NMT “not only focuses on the word it wishes to translate, but also looks at the words that appear before and after.” (Cullen 2020) According to Toral et al 2020, we need specially instructed systems for efficient translations: “Both automatic and human evaluations show that specifically tailored systems using a literary corpus perform much better than general-purpose commercial systems.” Indeed, we can find available on the internet for free machine translation sites for novels. However, even though they have been well instructed and given background knowledge from existing databases, feedback from users claims that they are not totally efficient. The work of a human translator is still needed afterwards.

Difficulties arise when figurative language is encountered, especially metaphors: “Metaphor is not limited to similarity-based meaning extensions of

individual words, but rather involves reconceptualization of a whole area of experience in terms of another." (Zajdel 2019) Traditionally, this is an operation which is part of human cognition. The process of understanding figurative language is complex, and machine translation is not without flaw yet:

[...] although MT has been a useful tool for technical and commercial texts, its potentials for literary texts remain a subject of debate (Toral and Way 2018 among others). Many argue that the process of translating literature is too subjective and cognitively complex for a computer to ever replace human translators. (Zajdel 2019)

However, we can use machine translation as a helper, and human translators can use it as a basis to start their translation from. It might be worth mentioning that, up to date, there are not any translations of novels worth mentioning created entirely by machine translation.

## 5. Conclusions

The main solution available from looking at studies automatic translation of literary texts would be a collaboration between machine translation and human translators. This is due to the fact that, in spite of the developments regarding the pragmatic level and the interpretation of context, even metaphors, machine translations still need, especially in the field of literary translations, human correcting: "Clearly, despite the machine's best efforts, the intrinsic ambiguity and flexibility of human language found in literary texts continues to need human management." (Cullen 2020).

Google Translate has progressed regarding automatic translations and is used more and more for literary translations. We might speculate that especially haiku poems, since they do not use usual figurative language, can be translated easily with its help, although human correction is always necessary. Machine translation issues also appear with respect to more factual texts, as there may be some small inaccuracies regarding syntactic and morphological levels, not just pragmatics levels.

As far as difficulties in translation are concerned, the pragmatics level of language is an issue for human translators as well. At times they face the challenge not only of understanding the context meaning, but also of transposing it in their translated text. Human translators may also benefit from cooperation with other translators at times in order to find better solutions. Human translators may, in some situations, lack the life experience necessary to translate certain literary texts; similarly with machine translation, they need more instruction.

In the end, we can recall the often mentioned dilemma of the impossibility of translation:

Translation is impossible! And I don't just mean it's really, really difficult, but really, it's not actually possible. There's not a single word in any of the languages I translate that can map perfectly onto a word in English. So it's always interpretative, approximate, creative. (Hahn and Fahmida 2014)

This statement, while it refers to human translation, shows the complexity of the task. Every word and every phrase in the source text need long-time thinking regarding their equivalent in the translated text. As a result, translation is not completely understood by human translator, and it is not a simple process of corresponding words, either. What is more, literary texts can complicate the task further, due to their use of figurative meaning. However, any text can be complicated further by the degree to which the context is understood.

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