



The Use of Artificial Intelligence in Academic Translation Tasks Case Study of Chat GPT, Claude and Gemini

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Abstract : This study aims to find out how artificial intelligence is used in the translation field today. Given the breadth and complexity of the topic, our research will focus on the university environment, as the academic community represents a fertile sample that extensively employs artificial intelligence in various research and scholarly pursuits, problem-solving, and particularly among language students who have found these tools to be invaluable resources. We will examine the various translation outputs of these media, considering that most AI models used for this purpose are fundamentally language models, as indicated by their developers' descriptions. Our methodology involves presenting and comparing translations from various models, analyzing their respective strengths, weaknesses, and limitations. We will also discuss the growing significance of this field and the possibility and the potential that it conveys to meet the demand of a wide category of researchers and students. In addition to that, we will address the probable inconvenient that may arise from excessive reliance on these tools without proper refinement and review of translations. In the present paper will conduct a comparative analytical study to analyze responses and compare different models and their translations.

Keywords : artificial intelligence (AI), translation, academic field, language model, output.

L'utilisation de l'intelligence artificielle dans les tâches de traduction académique Étude de cas de Chat GPT, Claude et Gemini

Résumé : Cette étude vise à explorer l'utilisation actuelle de l'intelligence artificielle dans le domaine de la traduction. Compte tenu de l'ampleur et de la complexité du sujet, notre recherche se concentrera sur le milieu universitaire, la communauté académique représentant un échantillon fécond qui emploie abondamment l'intelligence artificielle dans diverses activités de recherche et d'érudition, de résolution de problèmes, et particulièrement parmi les étudiants en langues qui ont trouvé en ces outils des ressources inestimables. Nous examinerons les diverses productions traduites de ces médias, considérant que la plupart des modèles d'IA

utilisés à cette fin sont fondamentalement des modèles de langage, comme l'indiquent les descriptions de leurs développeurs. Notre méthodologie implique la présentation et la comparaison de traductions issues de divers modèles, analysant leurs forces, faiblesses et limites respectives. Nous aborderons également l'importance croissante de ce domaine et le potentiel qu'il recèle pour répondre à la demande d'une large catégorie de chercheurs et d'étudiants. En outre, nous traiterons des inconvénients probables pouvant découler d'une dépendance excessive à ces outils sans un affinement et une révision appropriés des traductions. Dans le présent article, nous mènerons une étude analytique comparative pour analyser les réponses et comparer différents modèles et leurs traductions.

Mots-clés : Intelligence Artificielle (IA), Traduction automatique, Domaine académique, Modèle de langage. Texte traduit.

Introduction

Translation has undergone many important phases throughout recent history. This field of human sciences stands out as one of the most interdisciplinary areas. It connects to various arts & sciences, shaping the nature of translation deeply. It's all tied to the contexts of translated works and the transfer of texts between languages. Recently, the translation spectrum has seen the emergence of a new concept: automated systems of translation. This advancement driven by modern discoveries and application of many cutting edge technologies has rapidly gained the ground in diverse strata of academic society, transcending educational and professional limits. The proliferation of user-friendly translation applications, characterized by their versatility and expeditious interlingual conversion capabilities, has facilitated widespread adoption. Within this burgeoning domain of automated translation tools, those leveraging artificial intelligence (AI) technologies merit particular attention. These AI-backed systems shows a notable advantage over their conventional counterparts whether in terms of processing velocity, the input flexibility, or even the undeniable ability in managing intricate translation tasks. Moreover, the qualitative output of these systems often surpasses that of old automatic translation tools. Despite these advancements, certain risks persist. Overreliance on these tools or the absence of human oversight may precipitate errors, potentially resulting in significant reputational damage for users. After the preceding discussion, the following question arises in our minds: Can artificial intelligence models provide acceptable translation that can substitute for human translation, and which of the currently most widely used models is the most capable of providing translation that is equivalent to or approaches human translation?

The purpose of this study is to shed light on the significant progress of these models and the increasing reliance on them in the academic milieu, as well as the features contained in each of them and their weaknesses.

To answer this question, we posit that the improvements that have occurred in these media render them capable of providing largely acceptable translations, especially if the prompts provided to them by the user are carefully considered. Therefore, the ability of one of the models to produce a quality translation may depend on the nature of the assigned task as well as the linguistic direction in which the translation is performed. It may be more capable of providing a robust, well-founded translation in texts written in a certain language and translating them into a particular language, while its quality may decrease in other languages. In this study, we shall rely on the opinions of researchers and translators who have preceded us, despite the fact that they constitute a small group due to the novelty of the emergent topic. During the research, we shall investigate the history of machine translation and its relationship to artificial intelligence, as well as discuss the features of each model and its applications, particularly in the field of linguistics. In the applied part, we shall attempt to compare the outputs of the three models through a translation task that was previously presented to students in one of the university departments. We shall then evaluate them based on the quality of the translation and in accordance with the well-known theoretical frameworks in translation criticism, particularly the approach of Antoine Berman

1. Historical Development of Machine Translation:

A chronological examination of machine-assisted or fully automated translation reveals several historical stages through which this concept evolved to its present state. The earliest intimations of machine translation emerged in the seventeenth century as a hypothetical possibility, but practical implementation was not realized until the twentieth century, concurrent with significant technological advancements. Many scholars posit that the 1954 Georgetown experiment represents the first successful attempt at machine translation, successfully translating over sixty sentences from Russian to English (Naye, 2016). The field witnessed remarkable progress during the 1950s and 1960s with the development of early machine translation systems. A seminal event during this period was the publication of the Automatic Language Processing Advisory Committee (ALPAC) report in the mid-1960s, which evaluated contemporaneous progress in the field and identified constraints facing machine translation research. The progress of machine translation continued through various significant stages, for example in the 1970s and 1980s, when the world witnesses the emergence of commercial and operational systems of machine. These focused on practical applications and the pressing need for translation of specialized documents such as technical manuals, scientific papers, and administrative materials. Research in machine translation persisted through the 1990s, with

increasing attention to spoken language translation and conversation-based machine translation systems (Hutchins, 2001). The surge of cross-border social media platforms necessitated the development of media capable of performing this function, driven by commercial imperatives that saw substantial financial investment in developing electronic means for instantaneous translation. This materialized in the early 2000s with the advent of specialized platforms such as Google Translate and Reverso, as well as numerous applications including bilingual dictionaries and website content translation services, which quickly established themselves as fundamental tools among various sites and programs

As we entered the third decade of the 21st century, discourse shifted towards artificial intelligence-powered translation. Platforms such as Google Gemini, ChatGPT, and Claude have become ubiquitous, owing to their superior capacity to reproduce texts in alternative languages while accounting for linguistic and technical nuances across various text types, resulting in high-quality translation output. Moreover, the intersection of artificial intelligence and translation has become a focal point in translation studies that transcend human intervention. The proliferation of machine translation, catalyzed by the integration of artificial intelligence into translation programs, has prompted questions regarding the role of human translators in the face of advanced technology. It is evident that translators must adapt their skill sets and embrace new technologies such as Computer-Assisted Translation (CAT) tools, Neural Machine Translation (NMT), and various post-editing review methodologies to ensure their continued relevance in the evolving landscape of translation. (Eszenyi, R.& others. 2023)

Many believe that the human role cannot be ignored in this type of profession that involves transferring written or spoken texts from one language to another, as it While both MT and human translation play an important role in the translation industry, human translation by skilled professionals will always produce a more accurate, precise, and true-to-nature result than MT (ATA 2024). An example of this can be found in the study by Ahmed Moneus and Youssef Sahari, which addressed the quality of legal translations by comparing human translators and artificial intelligence systems. The results showed significant differences in translation quality, with human translation excelling due to the expertise of specialized translators (Moneus, A. M., & Sahari, Y. 2024).. Additionally, the unique nature of each translated text requires improvised handling. However, the researchers concluded that the accuracy of machine translation could potentially improve in the future, while emphasizing the need for further research to enhance and elevate its quality.

2. Types of automatic translation:

Automatic translation can be classified into several types based on the methodologies employed, as well as the devices, mechanisms, or software utilized. The endeavor involves categorizing these methodologies under the following designated terms:

2.1. Rule based Translation

This type is very common, and used by a lot of students, translators as well as scholars, Rule-Based Machine Translation (RBMT) is a type of machine translation that relies on a set of predefined linguistic rules and knowledge to translate text from one language to another. In RBMT, linguists formalize grammatical structures, lexicons, and translation rules, which the system uses to analyze and generate translations (Torregrosa, D. & others. 2019). Rule-Based Machine Translation (RBMT) utilizes linguistic rules and dictionaries to facilitate translation. It relies heavily on morphological, syntactic, and semantic analyses of both source and target languages. RBMT is particularly effective when applied to languages that share similar structural characteristics. Like Latin languages for example where you can see that the outcome of the automatic translation process is very close to what it should be under a human translator work supervision, the quality of translation is often satisfying due to the close ties between languages of the same origins that shared some rules and similarities. As an exemplar of the programs that can be cited in this context, SYSTRAN serves as a salient illustration. This program adapts and organizes linguistic rules while analyzing lexical correspondences and selecting the most contextually appropriate options on a case-by-case basis. Regarding the target language, the aforementioned program is equipped with pre-established templates that strictly adhere to the linguistic and grammatical systems pertaining to sentence formulation, organization, and sequencing. This feature mitigates, to a certain extent, common translation errors that stem from fundamental differences between certain languages. It is noteworthy that this program demonstrates heightened efficiency, particularly when dealing with languages characterized by simple, stable, and widely recognized grammatical structures. This is especially evident in languages sharing a common origin or those belonging to proximate geographical regions.

The SYSTRAN system exemplifies the sophisticated approach of rule-based machine translation systems, combining linguistic rule adaptation with contextual lexical analysis. Its pre-programmed templates for target language generation, which are rigorously aligned with linguistic and syntactic norms, contribute to reducing inter-lingual discrepancy errors. The system's

performance is notably superior when processing languages with less complex and more standardized grammatical structures, particularly those with shared etymological roots or geographic proximity.

2.2. *Statistical Machine Translation (SMT):*

Statistical machine translation (SMT) is a computational approach that treats the translation process as a probabilistic one. The goal is to find the target language string that maximizes the probability of the given source language string. This involves estimating two key components: the language model probability, which captures the fluency of the target language, and the translation model probability (Brown & others...1993 p 2.3.4.9.10). Koehn, Och & Marcu, (2003) proposed a new phrase-based model to evaluate previous methods. Simple techniques like heuristic phrase learning and lexical weighting achieve high performance while complex approaches like longer phrases or advanced word alignments do not improve much. Syntactic phrases degrade performance, and alignment heuristics matter more than the word alignment model (Koehn & others.2003 p 1.5.6.7).

2.3. *Neural machine translation :*

Early MT systems used statistical methods, but the breakthrough came with the advent of Neural Machine Translation (NMT) systems, which have significantly improved quality and fluency. NMT aims to develop a single neural network that can be trained end-to-end for maximum translation performance, negating the need for hand-crafted rules and subcomponents of traditional MT systems. NMT is usually trained on parallel corpora, but it has been shown that this can lead to suboptimal performance. One alternative is using the vast amount of monolingual data. Neural machine translation (NMT) arises from the neural network revolution of machine learning systems, to be more precise, it appeared in the aftermath of deep learning revolution, this latter relies on encoder-decoder neural network architecture considered to be cornerstone for NMT (Koehn, 2020). to explain more, it consists of an embedded encoder conceived specially to read the input data, another decoder is supposed to emit the translated text in the target language, and some features of the program connect the two processes in a way that the decoder can use the initial encoded meaning of the input in order to generate the output.

2.4. *Hybrid Machine Translation:*

Hybrid Machine Translation (HMT) is a recent idea in computational automatic linguistics. It mixes different machine translation methods to make

translations better & faster. By combining various techniques, HMT takes advantage of their strengths while reducing their weaknesses (Gutiérrez & olvera-Lobo, 2019 p2) main goal of HMT is to provide more accurate & fluent translations than just using one method alone. Traditional machine translation systems typically depend on either rule-based techniques or statistical models. Each approach has its own perks and limits. In contrast, HMT blends several methods together, like rule-based, statistical, neural, and example-based techniques. This blend helps HMT tackle a wider range of language issues & produce translations that are more detailed. HMT has shown its effectiveness with various language pairs, even those that may not have a lot of resources (Sánchez-Cartagena, Pérez-Ortiz,2020 p62). It uses techniques such as multi-source translation, system combination, and dynamic memory access. These are very useful for difficult words & complex sentence structures. And thus; we can sum the benefits of hybrid machine translation over single-method systems in the following points:

1. It renders better translation accuracy & fluency by combining different methods cleverly .and it shows greater ability to handle a variety of language issues and confusing parts no matter what the input and the output languages are.
2. Enhanced results in languages with fewer resources by using more linguistic tools of different types that helps to improve the quality of translation and more semantic accuracy.
- 3- It uses more resources than previous types which will cover a wider range of translation possibilities that deals with different text types,

Overall, hybrid machine translation marks an important step forward in machine translation technology by merging different techniques for better results compared to single methods (Wang&Yang, 2021, p.16). While it offers many advantages, ongoing research is needed to build a solid theoretical framework and enforce the integration of various components in machine translation systems in this type.

3. Major AI models and the translation task:

Numerous models appeared recently and seem to gain momentum in the academic field, students from various domains of study rely more and more on this AI assistance to accomplish their home-works to write essays and to build a new and unmatched experiences in the sciences, in this regard; we will cite three of the most used AI models that are best known for their accuracy their near-human like results and their effectiveness in multiple type tasks. Which are Chat GPT, Claude AI, and Gemini.

3.1. *Chat GPT:*

Chat GPT is an artificial intelligence (AI) chatbot that imitate the human linguistic capacities and conversational skills. The language model can respond to questions and compose various written content, including articles, social media posts, essays, code and emails¹. It is best known to be one of the first efficient chatbots that appeared in the last decade. The abbreviation GPT stands for "Generative Pre-trained Transformer". This title explains how Chat GPT processes requests and generates responses. Chat GPT is an AI model powered and owned by OpenAI, a research company specializing in artificial intelligence. The tool was created and launched in November 2022. The company was founded in 2015 by a group of entrepreneurs and researchers, including the famous Elon Musk and Sam Altman. OpenAI is funded by many investors, with Microsoft being a prominent backer. Additionally, OpenAI is known for developing a platform called Dall-E, an AI system that turns text into art,

3.1. *Chat GPT in translation:*

As its reputation grows among researchers of different fields, translators and translation seekers begin to rely more and more on Chat GPT to do tasks that are merely belonging to the linguistic transfer of written and sometimes spoken material. Interestingly, Chat GPT, as a machine translation tool, offers more than just standard translation; it can be further customized by "enhancing" the prompt, producing results that are preferred by professional translators (Sutanto & others, 2024, p.2096).

More often, scholars and students use this tool for different tasks such as: translating material from original to target language, proofreading the translated text to suggest modification on its content or to correct grammar, and phrases structure, additionally, Chat GPT is very useful in overcoming cultural gaps between languages, which is a benefit that is unique to artificial intelligence models. Moneus & Sahari (2024) investigated the comparative effectiveness of human translators against artificial intelligence (AI) in translating legal texts. Focusing on accuracy, competency, content, language, and style, and found out that ChatGPT can always deliver a good translation but it required a human intervention to complete some legal language gaps between original and target texts. A lot of users become familiar with the services this AI model is offering, especially with the speed of responses and the options it can handle, it is worth mentioning that the outcome depends on the tone and context in both languages. Generally, setting a lower temperature can result in higher performance. Putting

¹<https://www.techtarget.com/whatis/definition/ChatGPT>.

more focus and precision to the wanted task in prompts can further improve Chat GPT's performance, especially in complex tasks.

3.2. *Claude Instant*:

Claude Instant is an AI language model that was developed by a technology company named Anthropic, this model is designed to improve various applications through its advanced capabilities. Claude Instant is part of the Claude family of models, which includes Claude 1 and Claude 2. It is specifically designed by programmers to ameliorate speed and efficiency in real time responses, making it suitable for real-time applications. The model's automated structure helps it to process and treat texts in a record time compared to other models, which is particularly beneficial in a world requiring rapid responses, especially in fields like customer service and real-time information retrieval. Claude Instant has been evaluated alongside other prominent models like GPT-3.5 Turbo and Command-xlarge-nightly, showcasing its strengths in accuracy and safety of generated content across multiple domains (Wilhelm, Roos & Kaczmarczyk. 2023). The model's design stresses out on ethical considerations and safety, aiming to limit the issues linked with AI-generated misinformation (Shirodkar, Raotole & Gajbhiye. 2023).

- Claude Instant in translation:

Claude AI model implication in research, more particularly in translation, witnesses the highly significant advancements in the field of artificial intelligence and its growing utility among academicians. The AI model, developed by Anthropic, is thought to yield rapid accurate performance in machine translation tasks. Recent studies assess that Claude 3 Opus which is the most recent version of the company IA models excels in low-resource machine translation, this can be seen essentially in translating languages in cases of limited training data, this has a significant impact in enhancing accessibility in multilingual contexts (Enis & Hopkins... 2024). The model's resource capacity will assure a high translation quality even in cases when the prompt is given to handle translation tasks from less prevalent language pairs. Thus, this chatbot prove capability in being highly useful for researchers aiming to overcome linguistic hurdles in global communication methods (Enis & Hopkins... 2024) which contributes to knowledge unfolding. Moreover, Claude is known for its ability to generate realistic synthetic. That is used beneficially to improve traditional neural machine translation (NMT) systems, which indicates its potential to increase the productivity of the already-existing models and to explore new horizons in translation accuracy. Nevertheless, extensive resort to AI models like Claude

raises serious concerns of ethical nature including authorship related issues, data privacy and the use of customers information in advertising, the potential for not being neutral when translating exposes the users sometimes to some risks. Researchers must navigate these challenges to uphold academic integrity while leveraging the benefits of AI (Koçyiğit & Zhaksylyk 2023).

3.3. Google Gemini:

Google Gemini an Artificial intelligence language model marks a cornerstone in artificial intelligence (AI) technology, it forms a multimodal large language model (LLM) that combines advanced natural language processing with highly developed computer vision potential. This model is a branch of Google AI company, and it is structured as a chatbot that learns and process different data modalities such as text, images, audio, video and other materials, Thus. this sophisticated structure set it apart from previous versions that frequently use separate models for various tasks. The AI model design is predicated on a brand new transformer-based neural network that put together attention mechanisms and self-supervised machine learning techniques. It is notable in particular because the results reported by the Gemini team are the first to rival the OpenAI GPT model series (Brown et al., 2020) Gemini is presented in three different versions Ultra, Pro, and Nano, each one of these versions is enhanced to suit different computational environments and using situations. the first one Gemini Ultra, which constitute the variant with most capabilities showed unprecedented results among a wide benchmark group. It can even outpass human experts in multitask language comprehension alongside with the task of text generating. Within the academic sphere, and more precisely in linguistics field, Google Gemini is armed with a potential for assisting researchers and providing them with new and up to date methodologies when need be. Hence, it is worth saying that Its capacity for nuanced language comprehension and content generating is a great help for researchers that conduct linguistic studies with advanced corpus, which give them the opportunity to analyze and process large textual datasets with genuine results and unprecedented precision. However, while students recognize the benefits of using Gemini, various factors influence their intentions and actual usage, emphasizing the complexity of technology adoption in educational settings (Hasanein, Sobaih, & Elshaer, 2024, p.6).

Gemini's multimodal combination allows some unprecedented advance in semantic analysis, and discourse structure transcription and reformulation. The capacities of this model in coping with some multi and cross-lingual tasks marks new dawn for contrastive and comparative linguistics as well as

typological studies. This can be said in psycholinguistics, where Gemini's language generating abilities might be beneficial to create controlled and predicted stimuli for applied experiments on language processing and acquisition activities. In addition to that, we note that this potential to process and generate multimodal content opens up new possibilities for research probabilities especially in cognitive linguistics, and more particularly in studies that emphasize on the interplay between natural language. Google-backed AI model can play a crucial role in linguistics; especially in analyzing large-scale datasets that are collected from social media, which offers an extensive insight into the variation of languages, its change, and the social dynamics behind all this. Besides the AI model capacity to deal with code-switching and the vast multilingual content opens the lead for opportunities within the sphere of research in bilingualism and intercultural language contact and representation phenomena.

- Google Gemini in translation :

Gemini represents a significant application of advancing machine translation technology. The neural machine translation (NMT) capabilities that we explained earlier in this paper are empowered herein by its multimodal decoding capacities that are designed to deliver context-aware translations this will take into consideration both textual, visual, and expand even to auditory cues. The multimodal capacities that are integrated in this model are beneficial for translating the oral material and also the written texts that are rigged with cultural nuances, idiomatic expressions, and meanings that are related and vary according to the context. The details that always represent a headache for human translators. While Google Translate generally outperforms the language models in supported languages, Gemini Pro excels in specific languages, achieving the best accuracy in South Levantine Arabic, Romanian, and Mesopotamian Arabic. However, on average, general-purpose language models, including Gemini Pro, have not yet surpassed dedicated machine translation systems, particularly for non-English languages (Akter et al., 2023, p. 17). Additionally, Gemini's is able to create fluent, human-like genuine translations. This is possible via a vast spectrum of language pairs units. It can be used for both general and specialized translations. It can assist researchers and academicians in the translation of article content, books information and other types of research papers pushing the limits of research probabilities across linguistic boundaries. In literary translation for example. Gemini's improved nuanced decoding and comprehension of language can aid in the transfer of stylistic units and cultural specificities of the original. Moreover, simultaneous multilingual processing and text generating options

bring up possibilities for a real-time communication that overcomes transcend languages barriers during academic conferences and international collaboration events. The model's seems to be efficient in handling different disciplines terminology makes it roughly valuable for technical and scientific translations. Nevertheless. Some researches suggest that while Gemini composes a breakthrough in machine translation technology, the human intervention is deemed to be crucial, notably in high-stakes academic situations and professional circumstances, in order to maintain accuracy, "...Gemini, like other AI translation tools, can make errors in translation, such as transliterating terms instead of translating them accurately. For instance, Gemini transliterated certain parts of titles rather than providing a proper translation, which indicates a limitation in its understanding of context and meaning in the source text..." (Al-Salman & Haider, 2024 p 4-5). It also requires an upgrade to handle cultural sensitivities. And even for ethical considerations in translated text outputs.

4. Comparing the output of different models in translation:

In the following lines, we will use the aforementioned models in translating an example from the academic field of linguistics, the text to be translated is a passage we took from a translation task that have been submitted to students of second year in the French department at Oum El Bouaghui university in Algeria, we will analyze the output of each model in translation and we will compare the results in order to see which model is the most accurate and can deliver human-like translation.

4.1. The translation pattern:

we selected the following passage from an exercise of translation that have been served to students of second year in the French department, we asked the students to translate it from French to English and Arabic.

L'incendie

«... Mais eux parlaient avec des expressions, un ton qu'on ne trouvait pas à cet âge chez les garçons de la ville, ils étaient obstinément sérieux. Une pondération propre aux paysans. Omar, devant eux, se sentait tout gamin. Ils l'effrayaient par l'ombrageuse ardeur qu'ils déployaient à poursuivre un dessein : détruire des oiseaux, manier des troupeaux, ou défier des Européens ... »

we entered the passage that contains a paragraph extracted from Algerian writer **Mohammed Dib** novel "L'incendie" into the user interface in each AI model and we inserted the following prompt above it; "translate the following passage to Arabic Then English", here are the results:

Chat GPT 4o Mini	Calude 3,5 Sonnet	Gemini 1,5 Flash
<p>Arabic</p> <p>الحريق</p> <p>لكنهم كانوا يتحدثون بتعابير ونبرة لا تجدها في هذا العمر لدى أولاد المدينة، كانوا جادين بعناد. كان لديهم توازن خاص بالفلاحين. أمامهم، كان عمر يشعر بأنه مجرد طفل. كانوا يخيفونه بالحماس الغامض الذي يظهره في متابعة هدف ما: تدمير الطيور، أو إدارة القطعان، أو تحدي الأوروبيين.</p> <p>English</p> <p>The Fire</p> <p>But they spoke with expressions and a tone that one did not find at that age in city boys; they were stubbornly serious. They had a composure unique to peasants. In front of them, Omar felt like a mere child. They frightened him with the shadowy fervor they displayed in pursuing a goal: destroying birds, herding flocks, or challenging Europeans.</p>	<p>Arabic</p> <p>الحريق</p> <p>لكنهم كانوا يتحدثون بتعابير ونبرة لا نجدها عند الفتيان في المدينة في هذا العمر، كانوا جادين بعناد. رزانة خاصة بالفلاحين. عمر، أمامهم، كان يشعر بأنه طفل صغير. كانوا يخيفونه بالحماس الشديد الذي كانوا يظهره في متابعة هدف: تدمير الطيور، أو التعامل مع قطعان الماشية، أو تحدي الأوروبيين."</p> <p>English</p> <p>"The Fire</p> <p>But they spoke with expressions, a tone that was not found at this age among the boys in the city; they were stubbornly serious. A composure typical of peasants. Omar, in front of them, felt like a mere child. They frightened him with the fierce ardor they displayed in pursuing a goal: destroying birds, handling herds, or defying Europeans."</p>	<p>Arabic</p> <p>الحريق</p> <p>ولكنهم كانوا يتحدثون بعبارات ونبرة لا تجدها عند صبية المدينة في هذا العمر، كانوا جادين بعناد، ثمة وقار خاص بالفلاحين. شعر عمر أمامهم وكأنه طفل صغير. كانوا يخيفونه بتلك الحماسة الظليلة التي يبديها في السعي وراء هدف: تدمير الطيور، ورعاية القطعان، أو تحدي الأوروبيين.</p> <p>English</p> <p>The Fire</p> <p>But they spoke with expressions and a tone that one didn't find in city boys of that age. They were stubbornly serious, a gravity peculiar to peasants. Omar, in front of them, felt like a mere child. They frightened him with the shadowy ardor they displayed in pursuing an aim: destroying birds, herding flocks, or defying Europeans.</p>

4.2. *The analysis:*

→ **The Arabic translation:** overall, we can notice that the three models conveys the major part of the meaning, for the form, it is clear that no changes were made except for minor displacing of some linguistic units, and the use of different words by each model, for **ChatGPT**, it tend to lean more toward a literal translation, with the use of terms like 'أولاد المدينة' for translating « les garçons de la ville » and also the use of "توازن الفلاحين" for « une pondération propre aux paysans » is merely a literal translation, we find also that the verb 'كان' was excessively used several times which affects the structure, and marks it with redundancy, in addition to that, some terms were not holding the same meaning, like "غامض" that was chose for replacing the adjectif « ombrageuse », the latter word has a definitely a different connotation in the context, there is a gap between the meaning in the original text and the translated text that shows a lack of fluency, and the absence of literary form, all these remarks suggest that this translation needs an improvement. With **Claude**, we notice some fluency in the form and the absence of redudancy, the automatic translator chose to modify the structure of the sentence رزانة خاصة بالفلاحين. عمر، أمامهم، in order to fit to the arabic fluency and grammar, and to give it a literary however, same literal translation that does not fit for a literary text, This aims to give the text fluency and smoothness that mimics that found in Arabic literary language, which is credited to this translator. Regarding the rest of the passage, there were minor changes that did not exceed the previous model. However, we notice that the translation as a whole came out slightly better than ChatGPT, especially in terms of consistency and coherence in sentence elements as well as literary expressions. As for the Google Gemini model, if we closely examine the translation it provided, we see that it came out more refined, both in terms of word choice, expressions, sentence structures and their architecture, or in terms of the smoothness of meaning and its regularity in a semantic and intellectual arrangement that rivals texts written in Arabic. Despite the language model's choice of words "تدمير الطيور ورعاية القطعان" to translate "détruire les oiseaux et manier les troupes" and "جادين بعناد" to translate "ils étaient obstinément sérieux", which came out literal and deviated slightly from the proper instinct of the Arabic language in both semantic and linguistic aspects; the rest of the choices are considered, on the whole, a remarkable development and a masterstroke for automatic translation and artificial intelligence. Choosing phrases like "لا تجدها عند صبية في هذا العمر" as well as "ثمة وقار خاص بالفلاحين" and "الحماسة الظليلة" are choices that added a

beautiful literary style to the text and bridged the gaps between what was written in the original text and the translated text.

→ **The English translation ;**

Concerning the translation of the passage into English, we note that the three models we used provided translations that were quite close, with some changes that do not exceed the linguistic structure and semantic system of the sentences. To elaborate further, the translation provided by ChatGPT was the most literal, as it did not change much in the structure of the phrases and sentences, and provided the closest linguistic equivalents without much manipulation or creativity. This is clearly evident in the expressions "stubbornly serious" and "city boys", which, despite their eloquence in the French text, the way they were expressed in the translated text lacked literary quality. We also note that the choice of the word "unique" to translate "propre" is characterized by some semantic deviation, as the term in English is used to distinguish a single person or thing from others, not to distinguish an entire group.

The expression that appeared at the end of the passage, "à poursuivre un dessein", was translated in a correct linguistic manner, but it overlooked the uniqueness of the punctuation mark represented by the two dots and what followed it. It would have been more appropriate to add the word "like" and remove them, to make the text more readable and smooth in English. Moreover, the expression "challenging Europeans" is not eloquent, as the verb "to challenge" carries a positive connotation, such as a sporting challenge or a competition challenge, whereas the term "to defy" used by the other two models was more appropriate.

Apart from that, the model in question made a move that should be credited when it presented and moved the structure of the sentence "Omar devant eux se sentait tout gamin" and translated it as "in front of them Omar felt like a mere child", where it moved the subject despite its precedence in the French language, in order to adapt the structure of the statement and subject it to the rules of the English language and make it more literary. Furthermore, the translation of the phrase "ardeur" with the word "fever" is a sound and highly literary translation that relied on the context of the text rather than the lexical meanings of the words.

As for the second model, Claude, although its translation did not contain radical differences from the first model, the scope of the changes it made was somewhat bolder. This is evident in the expression "typical" and the expression "among the boys in the city", which were completely appropriate to the coherence of the ideas and their presentation in a beautiful literary form. We also note the

uniqueness of the mentioned model in its translation of the sentence "l'ombrageuse ardeur", which it rendered in an elegant manner as "a fierce ardor".

Regarding the translation of Google Gemini, it can be asserted that it was bold, if one may say so, and it was marked by some cautious yet impactful changes in the contextual meaning. Generally, the model blended literal translation and certain techniques of free translation, without exceeding the bounds of the original meaning. As for the literal frames of Gemini's translation, we observe that it rendered "les garçons de la ville" as "city boys" and "obstinément sérieux" as "stubbornly serious". Additionally, it presented the term "shadowy ardor" to translate "ombrageuse ardeur" and "destroying berds" as a translation of the phrase "détruire des oiseaux", which are all literal choices.

However, the translator handled the phrase "une pondération propre aux paysans" and rendered it as "a gravity peculiar to peasants", which is a free translation. The word "gravity" as an equivalent to "pondération" is a judicious choice in our assessment, and the term "peculiar" is also a translation that appears smooth, readable, and harmonious with the English semantic context. The automated translator also dealt with the phrase "dessein", which it translated as "aim", which, although it seems a correct translation, exhibits a slight semantic deviation, as the term is more proximate to discussing a distant goal that one labors to attain, rather than a minor objective for playing children.

This demonstrates that the translation of this model was at times successful and at other times deviated from the accurate meaning, though it remains generally acceptable. In summary, the translation of the three models into English was overall acceptable and more organized and fluent than those presented by the models into Arabic. This may be attributed to the proximity of the French and English languages and the similarity of certain rules and vocabulary, as well as the patterns of sentence structures. The results varied, as in the Arabic translation, one can assert that Google Gemini provided a solid and well-crafted translation, which was also quite literary, perhaps explained by the model's capacity to access a larger database given that it is owned by the company that operates the largest and most renowned search engine on the Internet. As for the translation into English, we observe that the Claude model provided the superior translation, as the analysis conducted demonstrates, which may be due to the significant improvements the company has made to this model recently, enhancing its database and prompt processing capabilities.

5. Final Research Findings:

In the present study, we conducted a comparative analysis of three widely utilized models among students and researchers alike: ChatGPT, Claude, and

Google Gemini. Our observations revealed substantial similarities in the translation outputs across these three models, indicating a convergence in the employed technologies, including algorithms, electronic systems, antecedent programs, and information repositories. Our investigation culminated in the following conclusions:

- 1. The aforementioned models rely on machine learning capabilities. The respective companies store user experiences and tasks executed through these platforms, subsequently implementing enhancements and quality improvements in the provided translations, as well as rectifying identified errors.
- 2. There exist no constraints on the form or type of translation provided. The user-input commands, colloquially termed "prompts," determine the translation quality. Users can augment these prompts with additional phrases, contributing to improved translation quality, reproduction, enhancement, and even error correction.
- 3. All employed models exhibited both strengths and weaknesses, although some models demonstrated relatively superior translation performance compared to others.
- 4. It can be posited that the Google model, Gemini, demonstrated high-quality translation into Arabic, providing fluent and clear translations at the sentence, lexical, and semantic levels, effectively conveying ideas with considerable accuracy.
- 5. Our analyses indicated that the Claude model performed optimally in English translation, producing near-literary quality translations. Despite minor imperfections, these did not significantly detract from the overall translation quality or disrupt the textual and semantic coherence of the translated passage.
- 6. Based on previous experiments with these and other models, we can assert with confidence that this field is undergoing rapid development. Translations provided by artificial intelligence platforms are continuously evolving due to the remarkable acceleration in improvements implemented periodically by the companies owning these platforms. A comparison between translations from older versions of AI models and newer ones reveals significant enhancements in the latter, presaging a promising future with further improvements that may rival and surpass human translation across all translation domains, including literary translation. This is particularly evident as companies compete to release new versions of their models, surpassing previous iterations, with the interval between releases now not exceeding six months to a year.

- 7. The importance of context in relation to text length becomes apparent, as digital models relying on artificial intelligence learn rapidly. As text length increases, these models become more adept at predicting and determining the general context of the text, thereby improving translation quality accordingly. Translation quality can be further enhanced by providing additional information to the model, such as the book or article from which the text is excerpted, its author, and the period of writing. This assists the model in forming a conceptual framework for the translated text and placing it within a specific template aligned with these parameters.
- 8. Human translators can leverage artificial intelligence to translate relatively lengthy texts, relying on these models to facilitate their work. Subsequently, they can review and analyze the translation, making necessary adjustments, which are likely to be minimal, thus saving considerable time and effort.

Conclusion:

These findings are derived from our previous experiments, correlated with this study and the analysis we conducted. It is worth noting the significant value that these models and the artificial intelligence revolution in general offer to translation and translators, analogous to other fields where artificial intelligence has become an integral part of current practices. We emphasize that while this study is important, its scope is limited compared to potential investigations that could include comparisons between other unmentioned models, different versions of the same model, various text types translated by the same model, or between free and paid models. Additionally, comparisons between human translation and AI-dependent translation could be explored. This underscores the complexity and richness of the subject matter, necessitating more in-depth and extensive studies.

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