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Introduction to thematic section: Challenges to the perfect machine-translation situation

1. Introduction

"Can machine translation fully dominate and replace human translators?"

> "As a freelance translator and a multilingual speaker, I would definitely say no. (…) Machine learning is getting better and better as the industry around it keeps moving forward but it would take a long long time for these machine based translation tools to understand the contexts of our conversations, our songs etc. I even think that these machines can **NEVER** be as good as a human in identifying which context this line, this sentence or this phase is about. (…) Machines take things too literally". Duy Thanh (retrieved 10th of November 2023)

> "AI consistently outperforms humans at chess, Go, driving cars, diagnosing cancer, but when it comes to translation and interpreting, the most sophisticated technology on earth is still by far the human brain.
>
> 1. Subjectivity – AI works best when it can apply data + algorithms rooted in objective reality. Language is a series of subjective conventions created by, used by, and constantly updated by humans.
>
> 2. Humor and Culture – (…) There are very few well-translated corpuses of humor, wit, sarcasm, and cultural nuance; its hard enough for human translators to get these across the language barrier; it's almost impossible for machines. (…)." Jonathan Rechtman (recuperated 10th of November 2023)

The purpose of the thematic section is to gauge the temperature of MT today by tapping into a selection of critical discussions, thereby shedding light on some challenges to a perfect machine-translation (MT) situation. The advancing MT technology certainly calls for critical discussions. This is, for instance, indicated by two translators' answers to the above-mentioned question posed on the online question-answer hub Quora. Both translators reflect on the same issue: MT cannot replace the human translator when the source text is highly context dependent, as the translation of such texts tends to involve deviations from the

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wording of the source text. A case in point are literary texts, which are often deemed problematic for MT because the texts are creative (O'Brien & Ehrensberger-Dow, 2020; Guerberof-Arenas & Toral, 2022) and non-repetitive (Hartley, 2009). In extension, Toral and Way (2018, pp. 264-265) point out that translations of literary texts are expected to convey the reading experience of the source text as well as its meaning, and this is challenging for MT.

Wrong rendering of content and style are but some out of a plethora of reservations to the quality issues in connection with MT. Others pertain to, for instance, the conception of the nature of translation, societal impacts, ethics, and legal ownership. From a conceptual and also societal point of view, with a reference to O'Thomas (2017), Tieber (2022) points out that when MT takes over translation processes from the human translator, our understanding of translation and translation quality alters, creating an incongruity between the industry and translation scholars, who may have different concepts of translation quality. In the words of Tieber (2022): "As MT developers strive for MT quality to achieve 'human parity' they create their own understanding of translation quality and migrate the very concept of translation into the realm of machines (O'Thomas, 2017)". Along the same lines, O'Thomas (2017) points out that a further concern may be that digitalization of translation may negatively affect the natural development of languages, which evolve "both in relation to other languages and in response to new contexts as they arise (…)." A related concern has to do with the effect that the potential eradication of human translation will have on human cognition. It can be assumed that MT's gradual takeover of translation tasks will inevitably not only diminish human translation competences, but will also impact human language competences and change society in general.

A different concern from a societal point of view has to do with so-called minor languages (sometimes referred to as low-resource languages; see, for example, Klimova et al., 2022) being disadvantaged when it comes to MT, which may be referred to as a linguistic bias (Bella, 2023). Forcada (2020) defines minor languages as languages with a small number of (literate) speakers, a reduced presence on the internet, several writing and spelling systems, a reduced number of linguistic experts, a lack of computer-readable resources, and a degree of distance from "normality" (e.g., because the language is mostly used in homes rather than in public life). Forcada (2020) lists a number of possible challenges for MT with such languages, mentioning, for instance, that some minor languages lack standard writing and spelling systems and that commercial MT systems are entirely geared for major languages, which are more profitable. Along similar lines, Klimova et al. (2022) outline a number of differences for MT with regard to major/minor languages and MT, including the fact that text-data corpora for major languages are vast, while minor languages are far from well-represented in this respect, which creates a huge quality gap in MT output.

Another major issue of concern is ethics. When translation is passed from the human translator to the machine, translation depends on the data on which the language models are trained. This has led to an increased interest in so-called algorithmic bias, meaning that machine learning algorithms tend to reproduce biases in the training data, for instance, in relation to gender (Farkas & Németh, 2022). This calls for a discussion of how MT can be carried out in a responsible way. Moniz and Parra (2023, p. 3) characterize responsible MT as "a combination of all factors that need to be considered when developing and deploying MT systems to ensure that such systems are ethically designed, including, but not limited to,

data bias, data licences and rights, ecological footprint, and intended end-users." This, among other things, concerns the data that are used to train MT systems, which may produce a distorted representation of reality by prioritizing certain social groups to the detriment of others, for example with regard to age, gender, ethnicity, and ideology, which are some of the examples listed by Moniz and Parra (2023).

Another issue with regard to data concerns their legal status. Lacruz (2023, p. 74) mentions areas of uncertainty regarding legal rights to mechanical machine translations and the use of translations as training data for MT algorithms. Ownership of translation databases (translation memories) has been put into question (Topping, 2000), as has the reuse of parallel data. With regard to the latter, Moorkens and Lewis (2020) argue as follows:

> "Parallel data is repurposed in ever-increasing amounts, but broken down to word and subword levels. At present, rights to ownership are rarely passed to the translator, meaning that, while an initial translation may be costly, secondary uses are very inexpensive."

Additionally, Moorkens and Lewis (2020) point out that the translators in question are not likely to have foreseen the various ways in which MT can be used.

We would like to emphasise that, during the process of preparing and publishing this thematic section, language technology in general has seen new and emblematic developments with the advent of generative pre-trained (GPT) models. As this technology is based on an interaction between a large language model (LLM) and humans via prompts, it is possible, at least to some extent, that the purpose and target audience are taken into consideration by the technology (Yamada, 2023), thus, potentially, reducing some of the MT challenges investigated in this special section. However, it should also be stressed that some challenges remain, for example bias and legal rights to data, and that that new challenges have arisen, such as problems with detecting plagiarism in exam papers and the generation of false data (data hallucination; Martino et al., 2023), leading to misinformation that may be used for propaganda (Feurriegel et al., 2023). With the use of LLM, translation and language production in general thus constitute an important and critical research field.

The thematic section contains four articles which address some of the challenges to a perfect MT situation briefly sketched above.

2. MT and context dependent language

According to the statements quoted in Section 1, MT of source texts that, in some way or other, depend on context is particularly prone to errors. One way of manifesting context dependency is through expressions that refer to cultural phenomena that are specific to a particular language community. In such cases, the translator functions as a cultural mediator, choosing the appropriate strategies and words (Katan, 1999/2004, p. 214). It can be argued that the translator also takes on the role as a mediator when it comes to translation of other types of context dependency, for example, humour, style, idiomatic expressions, and idiosyncrasies. These phenomena can involve creativity challenges similar to those sketched in Section 2. The article by Schjoldager et al., 'The professional translator vs. Google Translate: the case of Lars Larsen's autobiography', contributes to the discussion by comparing the published (entirely human) translation from 2004 of the autobiography by the Danish entrepreneur and businessman Lars Larsen with a recent MT carried out by Google

Translate. Taking their point of departure in Nord's (2018) classification of translation problems, the authors analyse three (potential) problem types: situation-related translation problems (often due to cultural references), style-related translation problems (due to register and dialect), and language-related translation problems.

3. MT and creativity

When linguistic expressions do not have a direct equivalent in the target language, translation may require a creative solution, that is, a solution that exhibits novelty and value to the context in question (Guerberof-Arenas & Toral, 2022, p. 185[1]). Such solutions are relevant to the translation of texts that, themselves, can be called creative. Hadley et al. (2022, p. 6) explain that a creative text is highly idiosyncratic and relies heavily on aesthetics. Examples of creative texts are philosophical works, films, advertisement, and literature (Hadley et al., 2022, p. 6). Such texts do not allow a direct translation, since this would not lead to a functional translation. Exemplifying this, Asimakoulas (2016) argues that the translation of comics often calls for creative solutions, making the translation an integrated part of the adaptation process, rather than just a "mechanical step".[2] In sum, creativity is an obstacle to a perfect MT, where MT systems generate translations without human intervention (Christensen et al., 2022, p. 17). In their article in this section, 'Creative skills development: training translators to write in the era of AI', Guerberof-Arenas and Asimakoulas assume that, although MT is competitive with the human translator when the source text is "standard and simple", MT cannot outmanoeuvre the human translator when creativity is needed to obtain a functional target text. When it comes to teaching translation, focus must therefore be on the development of divergent and convergent thinking. On the assumption that translation and creative writing share common ground and that competences in creative writing can be used productively for translation, they discuss methods for teaching creativity in the classroom.

4. MT and gender bias

In the realm of ethics, an ever more pressing concern is that MT, generated on the basis of recycled texts, may propagate discrimination of individuals in a systematic, unjust and biased way (Friedman & Nissenbaum, 1996). Ullman (2022, p. 125) points out that, although guidelines to the purpose of avoiding imbalanced training datasets have indeed been developed, specifications are still lacking as to the effect that actual bias may generate as well as incentives to increase the use of balanced datasets. A much-debated example of bias is gender. Savoldi et al. (2021, p. 845) list a number of examples of gender biases with language technologies, such as default use of masculine pronouns and reproduction of gender stereotypes with regard to professions: feminine for nurses and masculine for engineers. In the article 'Good, but not always Fair: An Evaluation of Gender Bias for three commercial Machine Translation Systems', Piazzolla, Bentivogli and Savoldi investigate the level of bias of three commercial MT systems: Google Translate, DeepL, and ModernMT in translation from English into three different languages, viz. Spanish, Italian, and French. To this purpose, they use the dataset MuSTSHEm, composed of spoken language data.

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[1] See central references to Creativity in Guerberof-Arenas and Toral's (2022) literature review.
[2] Asimakoulas (2016) suggests a model for the transfer of classical comedies into comic books and the subsequent translation of these.

5. Post-editing and copyright

Closely linked to ethical concerns are uncertainties with regard to legal ownership of machine-translated texts. When content is recycled, for example in text corpora and databases, it reaches a new purpose. This, obviously, raises a number of questions with regard to ownership. When it comes to books, songs, or films, for instance, ownership is protected by the Berne convention (WIPO), conferring to authors the rights to decide who can use their work and for what purpose. However, being based on text corpora made up of texts written by others, MT faces a number of copyright issues.[3] First, the fact that the monolingual/parallel texts making up the database for MT were created for a different purpose raises the question if authors and translators should receive compensation (Forcada, 2023, p. 50). Second, the fact that copyright regulations were conceived with a view to the human originator does not take into account that human intervention in the translation process may decrease, resulting in situations where human intervention is null (Lacruz, 2023, pp. 74-75). This generates a need for reassessing the concept of authorship, which seems to imply that authorship can only be conferred to human originators (Miernicki & Ng, 2021 in Lacruz, 2023, p. 76). An area where human intervention is indeed required is in the case of MT of literary texts, as evidenced by the outline above. The fourth concern is, therefore, which level of post-editing is required in order to confer copyrights to the post-editor. Koponen et al. (2022, p. 191) argue that the post-editor could "claim ownership" depending on the degree of originality left in the post-edited text, which is in accordance with a report from the European Commission (2014, p. 3) stating that a personal mark from translators may result in copyright. From the point of view of post-editors, this calls for a discussion of what it takes to leave a mark and how post-editors themselves understand their rights etc. It is this latter point of interest that is the focus of the article 'Literary Post-editing and the Question of Copyright' by Taivalkoski-Shilov and Koponen**.** Zooming in on issues of originality, creativity, and ownership in the post-editing of literary texts, they touch on aspects of MT that are closely related to the other contributions to the section. To the purpose of shedding light on post-editors' perception of their own role viz-a-viz the target text, the authors analyse peritexts (cover, preface, notes, etc.) and epitexts (interviews with the author, for instance) in connection with MT of two literary texts.

References

Asimakoulas, D. (2016). Aristophanes in Comic Books: Adaptation as Metabase. *Meta*, 61(3), 553–577.

Bella, G., Helm, P., Koch, G. & Giunchiglia, F. (2023). *Towards Bridging the Digital Language Divide.* https://arxiv.org/pdf/2307.13405.

Christensen, T. P., Bundgaard, K., Schjoldager, A., & Dam Jensen, H. (2022). What Motor Vehicles and Translation Machines Have in Common—A first step towards a translation automation taxonomy. *Perspectives. Studies in Translation Theory and Practice*, 30(1), 19-38.

European Commission (2014). *Translation and Intellectual Property Rights: Final Report*. Luxembourg: European Union.

Farkas, A. & Németh, R. (2022). How to measure gender bias in machine translation: Real-world oriented machine translators, multiple reference points. *Social Sciences & Humanities Open*, 5(1), 1-11.

Feuerriegel, S., Hartmann, J., Janiesch, C. & Zschech, P. (2023). *Generative AI. Business & Information Systems Engineering,* https://doi.org/10.1007/s12599-023-00834-7.

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[3] These are just a selection out of a series of challenges to copyright. See, for example, Forcada (2023) and Lacruz (2023) for a detailed overview and discussion.

Forcada, M. L. (2023). Licensing and usage rights of language data in machine translation. In H. Moniz & C. Parra Escartín (Eds.), *Towards responsible machine translation: Ethical and legal considerations in machine translation* (pp. 49–69). Springer.

Forcada, M. L. (2020). Building machine translation systems for minor languages: challenges and effects. *Revista de Llengua i Dret, Journal of Language and Law*, 73, 1-20.

Friedman, B. & Nissenbaum, H. (1996). Bias in computer systems. *ACM Transactions on Information Systems (TOIS), 14(3)*, 330–347.

Guerberof-Arenas, A., & Toral, A. (2022). Creativity in translation: machine translation as a constraint for literary texts. *Translation Spaces*, 11(2), 184-212.

Hadley, J.L., Taivalkoski-Shilov, K., Teixeira, C.S.C. & Toral, A. (2022). Introduction. In J.L. Hadley, K. Taivalkoski-Shilov, C.S.C. Teixeira, & A. Toral (Eds.), *Using Technologies for Creative-Text Translation* (pp. 1-17). Routledge.

Hartley, T. (2009). Technology and translation. In Munday, J. (Ed.), *The Routledge companion to translation studies* (pp. 106–127). Routledge.

Katan, D. (1999/2004). *Translating Cultures, An Introduction for Translators, Interpreters and Mediators*. Jerome Publishing.

Klimova, B., Pikhart, M., Benites, A.D. Lehr, C. & Sanchez-Stockhammer, C. (2022). Neural machine translation in foreign language teaching and learning: a systematic review. *Education and Information Technologies*.

Koponen, M., Nyqvist, S., & Taivalkoski-Shilov, K. (2022). Translating with technology: How digitalisation affects authorship and copyright of literary texts. In J. L. Hadley, K. Taivalkoski-Shilov, C. S. C. Teixeira, & A. Toral (Eds.), *Using Technologies for Creative-Text Translation* (pp. 180–198). Routledge.

Lacruz Mantecón, M.L. (2023). Authorship and Rights Ownership in the Machine Translation Era. In Moniz, H., Parra Escartín, C. (Eds.), *Towards Responsible Machine Translation. Machine Translation: Technologies and Applications, 4*. Springer, Cham.

Martino, A., Iannelli M. and Truong, C. (2023). Knowledge Injection to Counter Large Language Model (LLM) Hallucination. In C. Pesquita et al. (Eds.), *The Semantic Web: ESWC 2023 Satellite Events*. ESWC 2023. Lecture Notes in Computer Science, 13998. Springer, Cham.

Miernicki, M., Ng, I. (Huang Ying) (2021). Artificial intelligence and moral rights. *AI & Society*, 36, 319–329.

Moniz, H., Escartín, C.P. (2023). Introduction. In H. Moniz & C. Parra Escartín (Eds.), *Towards Responsible Machine Translation. Machine Translation: Technologies and Applications, 4*. Springer, Cham.

Moorkens, J. & Lewis, D. (2020). Copyright and the Reuse of Translation as Data. In M. O'Hagan (Ed.), *The Routledge Handbook of Translation and Technology* (pp. 469-481). Routledge.

Nord, C. (2018). *Translating as a purposeful activity: Functionalist approaches explained*. Routledge.

O'Brien, S. & Ehrensberger-Dow, M. (2020). MT Literacy – A cognitive view. *Translation, Cognition & Behavior*, 3(2), 145-164.

O'Thomas, M. (2017). Humanum ex machina: Translation in the post-global, posthuman world. *Target, 29(2)*, 284–300.

Quora (n.d.) [online]. https://www.quora.com/Can-machine-translation-fully-dominate-and-replace-human-translators?top_ans=241036765

Savoldi, B., Gaido, M., Bentivogli, L., Negri, M. & Turchi, M. (2021). Gender Bias in Machine Translation. *Transactions of the Association for Computational Linguistics*, 9, 845–874.

Slessor, S. (2020). Tenacious technophobes or nascent technophiles? A survey of the technological practices and needs of literary translators. *Perspectives*, 28(2), 238-252.

Tieber, M. (2022). *Perfect MT and the Concept of Translation*. Abstract HAL panel at NeTTT Conference, 4-6 July 2022, Rhodes Island, Greece.

Topping, S. (2000). Sharing translation database information: Considerations for developing an ethical and viable exchange of data. *Multilingual Computing and Technology*, 11(5), 59– 61.

Toral, A. & Way, A. (2018). What Level of Quality can Neural Machine Translation Attain on Literary Text? In J. Moorkens, S. Castilho, F. Gaspari & S. Doherty (Eds.), *Translation Quality Assessment. From Principles to Practice* (pp. 263-287) Springer.

Ullmann, S. (2022). Gender Bias in Machine Translation Systems. In Hanemaayer (Ed.), *Artificial Intelligence and Its Discontents, Social and Cultural Studies of Robots and AI* (pp. 123-144). Springer Nature.

World Intellectual Property Organization (WIPO) (n.d.*): Berne Convention for the Protection of Literary and Artistic Work* [online]. https://www.wipo.int/treaties/en/ip/berne/.

Yamada, M. (2023). *Optimizing Machine Translation through Prompt Engineering: An Investigation into ChatGPT's Customizability*. https://arxiv.org/abs/2308.01391.