# Research Perspectives into Translation Technologies: A Bird's Eye View

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#tradumatica20_research	
Translation technologies and research	
Tecnologies de la traducció i recerca.	EN / CA / ES
Tecnologies de la traducció i recerca	

Abstract

This paper presents the core ideas discussed by the #tradumatica20_research panel held online on 17 October 2022. The panel was moderated by Ricardo Muñoz Martín and featured, in order of intervention, Vanessa Enríquez Raído, Miguel A. Jiménez-Crespo, Christian Olalla-Soler and Pilar Sánchez-Gijón as participants. The paper follows the sequence of interview questions posed to the panelists, which focused on new challenges and opportunities in translation and interpreting technology, the importance of the "human factor" in this field, and the value of human-machine interaction research. The paper concludes with reflections on changes in translation and interpreting and how they are addressed in academic research.[1]

Resumen

Este artículo presenta las ideas centrales debatidas en el panel #tradumatica20_research, llevado a cabo online el 17 de octubre de 2022. El panel fue moderado por Ricardo Muñoz Martín y contó, por orden de intervención, con Vanessa Enríquez Raído, Miguel A. Jiménez-Crespo, Christian Olalla-Soler y Pilar Sánchez-Gijón como participantes. El artículo sigue la secuencia de preguntas de la entrevista presentada a los panelistas, centrada en los nuevos retos y oportunidades de la tecnología de la

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[1] With many thanks to Richard Samson for revising and editing the contents of the article.

traducción y la interpretación, la importancia del "factor humano" en este campo y el valor de la investigación sobre la interacción persona-ordenador. El documento concluye con una reflexión sobre los cambios en la traducción y la interpretación y cómo se abordan en la investigación académica.

Palabras clave: investigación en tecnologías de la traducción, inteligencia artificial, automatización del lenguaje, traducción automática, paridad humana, tecnologías inmersivas.

Resum

Aquest article presenta les idees centrals debatudes en el panell #tradumatica20_research, portat a terme online el 17 d'octubre de 2022. El panell va moderar-lo Ricardo Muñoz Martín i va comptar, per ordre d'intervenció, amb Vanessa Enríquez Raído, Miguel A. Jiménez-Crespo, Christian Olalla-Soler i Pilar Sánchez-Gijón com a participants. L'article segueix la seqüència de preguntes de l'entrevista presentada als participants, centrada en els nous reptes i oportunitats de la tecnologia de la traducció i la interpretació, la importància del "factor humà" en aquest camp i el valor de la recerca sobre la interacció persona-ordinador. El document conclou amb una reflexió sobre els canvis en la traducció i la interpretació i com s'aborden en la recerca acadèmica.

Paraules clau: recerca en tecnologies de la traducció, intel·ligència artificial, automatització del llenguatge, traducció automàtica, paritat humana, tecnologies immersives

1. Introduction

As scholars in Translation and Interpreting Studies (TIS), we have witnessed *Revista Tradumàtica*'s growth into one of the leading open access journals in the field of translation and interpreting technology since its inception in 2001. Given the rapidly evolving technology landscape, we would probably agree that addressing technology today is no small feat, particularly in comparison to the technology available at the beginning of the century. This is, however, what the editors of this special dossier focused on in celebration of the journal's 20th anniversary, inviting the TIS community to participate in five thematic round tables. These round tables, hosted through a fireside chat on Zoom, provided an opportunity for reflection between a panel of experts and spectators.

This article examines the key ideas discussed in the #tradumatica20_research panel moderated by Ricardo Muñoz Martín. The article follows the order of questions in the session, with each panelist's response under the relevant theme. Starting with Section 2, which covers the relationship between research and translation technology, the following sections explore the themes that emerged in relation to the challenges and opportunities presented by recent technology developments (Section 3), the future of the "human factor" in translation technology research (Section 4), and the value of research into human-machine interaction (Section 5). The final section presents concluding remarks on TIS research at the intersection of human translation, Natural Language Processing (NLP) and Human-Computer Interaction (HCI).

2. The Relationship between Research and New Technology

The panelists discussed the impact of new technology on TIS research, noting that machine translation (MT) has greatly influenced the practice of translation, including the tools used, work modes and professional roles. Vanessa Enríquez Raído discussed the transformation currently taking place in the industry, particularly since the rise of Neural Machine Translation (NMT), pioneered by Google in 2016. She highlighted that MT—or "artificial translation", to use LingoStar's (2021) fitting label (see also do Carmo, 2022)— is neither the main nor the only example of automation, as other automated workflow and system integration solutions are gaining attention from major Language Service Providers to an even greater degree.

Enríquez Raído also described the language service industry as strong and receptive to change. She drew on the latest Nimdzi report (Hickey, 2022) to note that revenues grew considerably in 2021 despite the challenges posed by COVID-19, but also to point out that the industry remains fragmented. The top 100 companies account for only 17.9% of total revenue in 2021 (ibid.: 16) and it is 'only' in these top 100 companies that NMT has been fully integrated into their daily operations, and that Post-Editing Machine Translation (PEMT) is gaining more prominence compared to translation from scratch. The rest of the market is, in Enríquez Raído's words,

> made up of thousands of small companies so what this data tells us is that market size/revenue appears not to be substantially impacted by advances in automation and developments in artificial intelligence [AI], but that there appears to be significant market spread across the industry. The gap is widening, so to speak, and this concerns the degree of technology adoption—automated language, workflow and system integration solutions—the type of services provided, the salaries earned and the skillset required to perform tasks that are difficult to automate. (#tradumatica20_research, 2022)

Enríquez Raído's argument that automation may not in itself affect industry size, but rather, change how translators work and prosumers of translation interact with language technology (see e.g. Sager, 1993; Pym and Torres-Simón, 2021), seems to align with the picture portrayed elsewhere. From 2016 to 2019, PEMT accounted for only about 4% of the total language services market turnover, far below its predicted growth (DePalma et al., 2019: 17, in do Carmo and Moorkens, 2022: 15). MT and computer-assisted translation thus appear not to account for the lion's share of the market in Europe, according to Muñoz Martín, who referred to the latest European Language Industry Survey (ELIS, 2022). That PEMT has not replaced traditional translation as the main service offered by the language industry—as predicted by some (e.g. Lommel and DePalma, 2016)—does not mean, however, that steady PEMT growth is not to be expected in the foreseeable future. Meanwhile, TIS research on translation and interpreting technology, according to Enríquez Raído, largely focuses on shifts in the nature of professional and non-professional translation brought about by use of technology and automation. It also centres around the implications of Artificial Intelligence (AI) for society, including critical aspects related to data privacy (e.g. Canfora and Ottmann, 2020), digital literacy (Bowker and Buitrago Ciro, 2019), environmental sustainability and digital ethics (Cronin, 2019; Jiménez-Crespo

and Enríquez Raído, 2021; Kenny, Moorkens and do Carmo, 2020; Nurminen and Koponen, 2020; Moorkens, 2021).

Miguel A. Jiménez-Crespo explored the gap in the field of translation technology, not in terms of market spread, but between TIS research and computational linguistics, and the industry. The closing of the gap between industry and academia is one of the most exciting developments for Jiménez-Crespo in recent years: "Over the last 20 years there has been a lot of research in the development of CAT tools and new technology, in which translation researchers and professional translators themselves—and non-professionals too—have been left behind" (#tradumatica20_research, 2022). TIS researchers have therefore responded by studying areas such as cognitive friction, tool use, and ergonomics. Jiménez-Crespo points to a positive correlation between NMT and the number of European Union-funded research projects.

Christian Olalla-Soler's opening statement was also shaped by changes in translation practices and the increase in MT output quality. He linked democratization of access to multilectal mediated communication (Halverson and Muñoz Martín, 2020) with the appearance of new professional roles like PEMT, prompting TIS researchers to study these developments and adapt translator and interpreter training accordingly. For Olalla-Soler, the usability and accuracy of MT output is a major TIS research line, with findings confirming a boost in MT output quality. This has sparked a debate among scholars about the future of translators, with some arguing that translators as we know them today will disappear and others cautioning against this idea (see Section 4). Be that as it may, Olalla-Soler noted that TIS researchers are generally optimistic about the variety of tools and their rapid improvement; an optimism, he added, not always shared by professional translators.

He also questioned whether the skepticism (if not, disdain) and cognitive friction that some professional translators feel towards MT could be due to a lack of proper dissemination of research in the field of translation and interpreting technology: "Maybe we have failed in differentiating the good, the bad and the ugly of such technology, and in passing that information on to professionals" (#tradumatica20_research, 2022). As noted in academic debate elsewhere (e.g. do Carmo and Moorkens 2022), another possible explanation for the tension between translators and technology might be the disparity in the value placed on translation. Professionals often view translation as an act of effective communication, whereas the industry views it as having commercial value. This mismatch might be at the root of some of the conflicts between translators and technology (ibid: 21). Olalla-Soler further proposed that we may have reached a point where professional translation is no longer the backbone of TIS research on translation and interpreting technology, as the community of users has grown and become more diverse. This proposition appears not to be far-fetched, for the shift towards basic translation and interpreting literacy has gained increasing attention among TIS scholars.

Pilar Sánchez-Gijón, as both a panelist and editor of the journal, addressed the relationship between research and new technology in terms of a gap in training. According to Sánchez-Gijón, *Revista Tradumàtica* was born out of a concern among translator trainees and scholars that industry developments are often disconnected from academia.

She also referred to the first journal issue on translation memories as possibly the most cited in the history of the journal. In our view, this is in all likelihood a result of the rise in commercial translation memories in the 1990s, considered "translation's first industrial revolution" by do Carmo and Moorkens (2022: 12), amongst others. The realization that much of the research impacting translation and translators does not depend on them but rather the texts requiring translation was, according to Sánchez-Gijón, another important reason for the journal's creation. She concluded by emphasizing the difference between translation tools and research tools. According to Sánchez-Gijón, a major research challenge is the use of a variety of tools, approaches and metrics to measure the same phenomena, including popular notions such as productivity and efficiency. This kind of disparity can indeed hinder the progress of research in the field. Ricardo Muñoz Martín added that the limited availability of tools and technology for languages other than the 12 major ones also poses challenges for research.

3. Recent Technology Developments: New Possibilities and Risks

The discussion on the relationship between research and technology was narrowed down to opportunities and risks associated with recent developments, particularly in relation to specific tools and use cases. Two main themes emerged: the need to address the social inequalities caused by increased digitalization and automation, and the need to counteract the industry's excessive hype and promises of instant, human-like translations.

According to Enríquez Raído, new technology such as AI, Natural Language Processing (NLP) and kinds of coding are pushing ever further the boundaries of human-machine interaction. These technologies are gaining popularity for their ability to provide a more immersive user experience, particularly in the fields of augmented and virtual reality. Mixed reality is increasingly used in industries like medicine, automotion, engineering, education and, "interestingly for us, language learning" (#tradumatica20_research, 2022). She believes mixed reality applications have great potential due to their environmental perception capabilities and predicts that this technology will be widely adopted in the future. However, like any new technology, mixed reality also has its limitations, including social disadvantages and unequal access to expensive, new devices. Unequal distribution of data for AI training among languages and technologies is also a major concern for researchers. She referred to sign language as a case in point, for it poses particular challenges due to its lack of written form and the relatively small number of users. This can make data collection and machine training more difficult, as sign language requires more work and processing capacity than any other language modality, amongst other non-computational issues.

Enríquez Raído also expressed concern about the negative impact that AI could have on human communication literacy and the risks associated with the use of NLP in life-altering situations such as employment, healthcare, justice and finance. Sánchez-Gijón later expanded on the former, arguing that the tech industry is striving to make humans assimilate machine language, with the goal of removing language barriers. This idea, whose origins Muñoz Martín traced back to the Enlightenment, indeed seems to be pursued through techno-solutions like mobile devices that enable increased

interconnectivity. As later noted by Jiménez-Crespo, however, the availability and use of such technology vary across countries. In Africa, for instance, people are more likely to rely on mobile phones, which has led to developments like Meta's No Language Left Behind (NLLB) AI project. This open-source model aims to provide human-like machine translations between 200 languages, including low-resource languages such as Asturian, Luganda, and Urdu, as explained by Jiménez-Crespo.

For Olalla-Soler and Sánchez-Gijón, AI in Computer-assisted Interpreting (e.g. Fantinuoli, 2018) and MT, respectively, show great potential in TIS research. Although there has been little technology progress in translating sign language into spoken language, Olalla-Soler predicts further advances in speech-to-speech interpreting or translation, including personal use of such technology and machine interpreting literacy. Sánchez-Gijón noted the greatest change over recent years has been the shift towards the use of a statistical approach to process language as data and nothing else but data. This development has wide-ranging implications for less commonly documented languages and human communication in general.

4. The Role of the Human Factor in Translation Technology Research

The panelists discussed the misconceptions surrounding, first, the potential for machines to replace human translators and, secondly, the industry-induced perception that translation is a simple task that can be performed by anyone, including machines. Enríquez Raído alluded to the history of automation to emphasize that it is routine jobs that are at high risk of being replaced by machines, as algorithms and annotated data continue to improve. Despite neural networks and deep learning having reached unprecedented levels of machine fluency and accuracy in language interpretation and production, Enríquez Raído argued that machines cannot fully understand the nuances and immense array of paralinguistic features involved in human communication, such as sentiment and emotion. Therefore, there is still a need for human-driven translation and interpreting work, even if only in the form of data annotation and curation across certain industry segments. Jiménez-Crespo highlighted the increasing need for these roles, i.e. in-domain, text-specific data annotation and curation.

Also, Jiménez-Crespo, wearing both a teacher and researcher's hat, emphasized that the scholarly community in translation technology goes beyond machine notions of translation by examining, for instance, situational and text-type factors, and the creativity involved in human translation. While he sees a consistent move towards improving MT output, and we are led to believe this move will eventually reach the finishing line, TIS researchers should continue to investigate "what is human about human translation" from a cognitive perspective (#tradumatica20_research, 2022). For Jiménez-Crespo, this type of research informs the human aspect of translation technology, with longstanding translation theories based on functionalism and equivalence, for instance, informing today's training of post-editors.

Olalla-Soler, for his part, suggested the emphasis in discussions about technology be shifted from the human factor to the technology factor, a notion he first came across

at the 2013 OPTIMALE conference. He argued that there is a need for translation technology because of the human need for cross-language communication; therefore, the human factor should not be a central part of the technology equation but rather the other way around. Possibly, then,

> we just need a definition of translation that is resilient to this [techno-positivist] environment, which reveals its core elements as a human activity responding to a human need, while also allowing for the flexibility required to describe its many relevant technological and business dimensions. (Carmo and Moorkens, 2022: 19)

The panelists concurred with Olalla-Soler's suggestion to shift the focus, with Muñoz Martín adding that any narrow and reductive view of translation should be rejected in order to put humans at the centre of the human-machine loop. Sánchez-Gijón rounded up the discussion by demystifying the notion of human parity in MT research (e.g. Toral et al., 2018), thereby emphasizing that there is currently no non-mathematical way of measuring this concept, considering the diverse perspectives on translation among users with different linguistic and cultural backgrounds. In other words, despite industry rhetoric often overpromoting technology, the reality is that individual translations and evaluations of their quality remain subjective and will continue to vary greatly.

5. The Benefits of Research on Human-Machine Interaction

The scientific community should be concerned with research into human-machine interaction to critically assess how language technology impacts human communication and vice versa, according to Enríquez Raído. She referred to the Language in The Human-Machine Era (LITHME) report (Sayers et al., 2021), which predicts the distinction between written and spoken language will gradually fade as speech recognition tools become more prevalent or as texts are read more like speech. As futuristic as this may sound, according to this scholar research is destined to increasingly focus on immersive technology and tighter integration with our senses, and how this integration plays out in different language settings, modalities and uses. Sánchez-Gijón pointed to augmented reality as a significant recent development for translating texts from images.

Enríquez Raído acknowledged the research challenge posed by gaining prompt access to state-of-the-art technology, particularly that in prototype stages such as mixed reality. To effectively assess human interaction with immersive technology, timely access to the technology itself is crucial in conducting targeted research, as is considering localization in the design stage of a product rather than as an afterthought. She stated that lack of resources in academia often leaves TIS researchers with a reactive response instead of a proactive approach to the empirical study of latest developments. Despite these drawbacks, however, she acknowledged that falling behind industry developments is a necessary evil, for it enables academia to engage in much-required critical reflection.

Jiménez-Crespo also tackled the impact of technology integration on cognitive friction, noting that research on machine-human interaction can provide insight, for instance, into bilingual users' preferences for human vs. machine translation. His own observations

suggest that bilingual users are resistant to MT being employed for important messages on social media. He also emphasized the importance of research on translation technology—e.g. the length of time people spend on MT apps on mobile phones for personal use—in order to learn how users' needs can be met at the human-machine intersection.

Sánchez-Gijón also emphasized the importance of research into the use of MT by professional and non-professional translators, with Olalla-Soler reinforcing the value of ethnographic research to discover how humans interact with human and non-human agents in professional settings. He also emphasized the worth of research on ergonomics to improve the usability and acceptance of new tools, and to inform future understandings of human-machine interaction. To illustrate, Muñoz Martín referred to the growth of subtitling and how it is influenced by user interactions with technology, as users prefer to watch subtitled content on phones or mobile devices in public settings. Sánchez-Gijón further highlighted the multimodal and inter-semiotic nature of translation, and the critical role of professional translators in creating meaning for interlingual communication. The constantly changing technology landscape and blurring of boundaries between information modalities mean that professional translators are an indispensable part of cross-language communication in a wide variety of settings.

6. Concluding remarks

The last two decades since the birth of *Revista Tradumàtica* have seen the translation and interpreting professions undergo significant changes due to advances in technology, particularly in the area of machine translation and AI. Academic research into translation and interpreting technology has subsequently focused on this area, including the development and evaluation of machine translation systems and AI applications, and challenges and risks—such as the potential for errors—and the impact on the role and job prospects of human translators.

Research has also highlighted the need for continued development of basic literacy in machine translation and interpreting, and for the translation and interpreting professions to evolve in response to the changing landscape of language automation. Research in the first instance (i.e. basic machine translation and interpreting literacy) is largely geared towards counterbalancing the rhetoric propagated by the industry concerning commercial notions of translation, which remain oversimplistic, thereby masking the infinite nuances of cross-language communication as a complex, human decision-making and problem-solving process. The same is true for human parity discourse in MT industry-led science. Techno-positivist discourses may fare well with finite data input and output possibilities for automation that can indeed support accessibility and societal change through democratised access to information and cross-linguistic communication. Such rhetoric does not fare so well, however, when it comes to academic notions of translation as a non-mathematical data coding process.

Research in the second instance, i.e. the need to adapt to and evolve hand in hand with technological progress, has produced models and theories that try to incorporate

the changes brought about by digitalization and use of technology to inform professional practice. We share the view that the discipline of Translation and Interpreting Studies has adapted to the realities and requirements of professional practice. We contend nonetheless that TIS theories and models are yet to impact industry developments and discourse, to a meaningful extent. The relationship between our discipline and the industry remains "largely unidirectional" (do Carmo and Moorkens, 2022: 18). This does not mean, however, that the academic community should cease to safeguard the role of human translators and interpreters at the intersection of the human-machine interactive continuum. Nor should we cease to question, neither the value of technology advances for society at large, nor the distinction between reality and fiction often obscured by generative AI models. This also applies to the opacity and the non-accountability of machine-adopted solutions that rely on trillions of hard-to-trace and hard-to-modify parameters (Sánchez Torrón, personal communication, 23 November 2022), not just in cross-language communication, but also in life-altering scenarios.

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